

FORMAL MODELING IN POLITICAL SCIENCE

Politics G53.2105
New York University
Fall 2006
Class: Mon., 6:20 - 8:20 PM

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Applications of game theory—and an alternative strategic theory called “theory of moves”—as well as social-choice theory to a wide variety of strategic situations, principally but not exclusively in politics, will be examined. Uses of strategy in voting in committees and elections, in political campaigns, in the defense and deterrence policies of nations, and in bargaining and coalition-building situations will be among the topics discussed. Secrecy and deception as political strategies will also be analyzed.

Although the applications of strategic thinking will be mainly to American and international politics, strategy in everything from the Bible to sports and business today will be studied, too. Social-choice topics that will be analyzed include the manipulability of different voting systems, problems of achieving proportional representation in parliamentary democracies, and conflicts among different apportionment methods. Fair-division procedures for resolving disputes will also be analyzed.

In addition to the required readings, further readings will be recommended throughout the course for those interested in pursuing particular topics in greater depth. No mathematical training beyond high school mathematics is assumed in the course. The written requirements of the course include a midterm and a final examination plus a short paper on a topic that is chosen in consultation with the instructor. Each of the three written requirements will count approximately 1/3 towards your final grade.

Required Books

Brams, Steven J. *RATIONAL POLITICS: DECISIONS, GAMES, AND STRATEGY*. Washington, DC/Boston: CQ Press/Academic Press, 1985/1989 (out of print; used copies and bound reproductions in bookstore). **RP**

Brams, Steven J. *THEORY OF MOVES*. Cambridge, UK: Cambridge University Press, 1994. **TOM**

Brams, Steven J., and Alan D. Taylor. *THE WIN-WIN SOLUTION: GUARANTEEING FAIR SHARES TO EVERYBODY*. New York: W.W. Norton, 1999. **W-W**

Dixit, Avinash, and Barry Nalebuff. *THINKING STRATEGICALLY: THE COMPETITIVE EDGE IN BUSINESS, POLITICS, AND EVERYDAY LIFE*. New York: W.W. Norton, 1991. **TS**

Assignments Due

Sept. 11: **RP**, chs. 1-2; **TOM**, Introduction & ch. 1; **TS**, Introduction & chs. 1-2
 Sept. 18: **TOM**, ch. 2; **TS**, chs. 3-4
 Sept. 25: **TOM**, ch. 3; **TS**, chs. 5-6
 Oct. 2: **TOM**, chs. 4-5; **TS**, ch. 7
 Oct. 16: **TOM**, chs. 6-8
 Oct. 23: Midterm Examination
 Oct. 30: **RP**, ch. 3; **TS**, chs. 8-9
 Nov. 6: **RP**, ch. 4; **TS**, chs. 10-11
 Nov. 13: **RP**, chs. 5 & 7 (skip ch. 6)
 Nov. 20/22: 6-8 page paper due; oral reports
 Nov. 27: **RP**, chs. 8-9; **TS**, chs. 12-13
 Dec. 4: **W-W**, entire book
 Dec. 11: Review
 Dec. 18(?): Final Examination

Game Theory Texts

- Aliprantis, Charalambus D., and Subir K. Chakrabarti. **GAMES AND DECISION MAKING**. Oxford University Press, 2000.
- Binmore, Ken. **FUN AND GAMES: A TEXT ON GAME THEORY**. D. C. Heath, 1992.
- Camerer, Colin F. **BEHAVIORAL GAME THEORY: EXPERIMENTS IN STRATEGIC INTERACTION**. Princeton University Press, 2003.
- Chatterjee, Kalyan, and William Samuelson (eds.). **GAME THEORY AND BUSINESS APPLICATIONS**. Kluwer, 2001
- Davis, Morton D. **GAME THEORY: A NONTECHNICAL INTRODUCTION**, 2nd ed. Basic, 1983.
- Dixit, Avinash, and Susan Skeath. **GAMES OF STRATEGY**, 2nd ed. W.W. Norton, 2004.
- Dutta, Prajit K. **STRATEGIES AND GAMES: THEORY AND PRACTICE**. MIT Press, 1999.
- Fudenberg, Drew, and Jean Tirole. **GAME THEORY**. MIT Press, 1991.
- Gardner, Roy. **GAMES FOR BUSINESS AND ECONOMICS**. Wiley, 1995.
- Gibbons, Robert. **GAME THEORY FOR APPLIED ECONOMISTS**. Princeton University Press, 1993.

- Gintis, Herbert. GAME THEORY EVOLVING: A PROBLEM-CENTERED INTRODUCTION TO STRATEGIC MODELING IINTERACTION. Princeton University Press, 2000.
- Hargreaves Heap, Shaun P., and Yanis Varoufakis. GAME THEORY: A CRITICAL TEXT, rev. ed. Routledge, 2004.
- Luce, R. Duncan, and Howard Raiffa. GAMES AND DECISIONS: A CRITICAL SURVEY. Wiley, 1957.
- McMillan, John. GAMES, STRATEGIES, AND MANAGERS: HOW MANAGERS CAN USE GAME THEORY TO MAKE BETTER BUSINESS DECISIONS. Oxford University Press, 1992.
- Mendelson, Elliot. INTRODUCING GAME THEORY AND ITS APPLICATIONS. CRC Press, 2004.
- Miller, James D. GAME THEORY AT WORK: HOW TO USE GAME THEORY TO OUTTHINK AND OUTMANEURER YOUR COMPETITION. McGraw-Hill, 2003.
- Morrow, James D. GAME THEORY FOR POLITICAL SCIENTISTS. Princeton University Press, 1994.
- Montet, Christian, and Daniel Serra. GAME THEORY AND ECONOMICS. Palgrave Macmillan, 2003.
- Osborne, Martin J. AN INTRODUCTION TO GAME THEORY. Oxford University Press, 2004.
- Rasmusen, Eric. GAMES AND INFORMATION: AN INTRODUCTION TO GAME THEORY, 3rd ed. Basil Blackwell, 2001.
- Ritzberger, Klaus. FOUNDATIONS OF NON-COOPERATIVE GAME THEORY. Oxford University Press, 2002.
- Romp, Graham. GAME THEORY: INTRODUCTION AND APPLICATION. Oxford University Press, 1997.
- Rubinstein, Ariel, and Martin J. Osborne. A COURSE IN GAME THEORY. MIT Press, 1994.
- Samuelson, Larry. EVOLUTIONARY GAMES AND EQUILIBRIUM SELECTION. MIT Press, 1997.
- Straffin, Philip D. GAME THEORY AND STRATEGY. Mathematical Associaiton of America, 1993.

Vega-Redondo, Fernando. EVOLUTION, GAMES, AND ECONOMIC BEHAVIOUR. Oxford University Press, 1996.

Vega-Redondo, Fernando. ECONOMICS AND THE THEORY OF GAMES. Cambridge University Press, 2003.

Watson, Joel. STRATEGY: AN INTRODUCTION TO GAME THEORY. Norton, 2002.

Weibull, Jörgen. EVOLUTIONARY GAME THEORY. MIT Press, 1995.

Applications and History of Game Theory and Social-Choice Theory

Ankeny, Nesmith C. POKER STRATEGY: WINNING WITH GAME THEORY. Basic, 1981.

Arrow, Kenneth J., Amartya K. Sen, and Kotaro Suzumura (eds.). HANDBOOK OF SOCIAL CHOICE AND WELFARE, vol. 1. North Holland, 2002

Aumann, Robert J., and Sergiu Hart (eds.). HANDBOOK OF GAME THEORY WITH ECONOMIC APPLICATIONS, vols. 1/2/3. North Holland, 1992/1994/2002.

Austen-Smith, David, and Jeffrey S. Banks. POSITIVE POLITICAL THEORY I/II: COLLECTIVE PREFERENCE/STRATEGY AND STRUCTURE. University of Michigan Press, 2000/2005.

Axelrod, Robert. THE EVOLUTION OF COOPERATION. Basic, 1984.

Axelrod, Robert. THE COMPLEXITY OF COOPERATION: AGENT-BASED MODELS OF COMPETITION AND COOPERATION. Princeton University Press, 1997.

Baird, Douglas G., Robert H. Gertner, and Randal C. Picker. GAME THEORY AND THE LAW. Harvard University Press, 1994.

Barbanel, Julius B. THE GEOMETRY OF EFFICIENT FAIR DIVISION. Cambridge University Press, 2005.

Bates, Robert H., *et al.* ANALYTIC NARRATIVES. Princeton University Press, 1998.

Bewerdorff, Jörg. LUCK, LOGIC, AND WHITE LIES: THE MATHEMATICS OF GAMES. A. K. Peters, 2005.

Bicchieri, Cristina, Richard Jeffrey, and Brian Skyrms (eds.). THE LOGIC OF STRATEGY. Oxford University Press, 1999.

- Binmore, K. G. GAME THEORY AND THE SOCIAL CONTRACT. Vols 1/2: PLAYING FAIR/JUST PLAYING. MIT Press, 1994/1998.
- Binmore, Ken, Alan Kirman, and Piero Tani (eds.). FRONTIERS OF GAME THEORY. MIT Press, 1993.
- Boorman, Scott A. THE PROTRACTED GAME: A WEI-CH'I INTREPRETATION OF MAOIST REVOLUTIONARY STRATEGY. Oxford University Press, 1969.
- Brams, Steven J. BIBLICAL GAMES: GAME THEORY AND THE HEBREW BIBLE. MIT Press, 1980/2003.
- Brams, Steven J. GAME THEORY AND POLITICS. Free Press/Dover, 1975/2004.
- Brams, Steven J. NEGOTIATION GAMES: APPLYING GAME THEORY TO BARGAINING AND ARBITRATION. Routledge, 1990/2003.
- Brams, Steven J. PARADOXES IN POLITICS: AN INTRODUCTION TO THE NONOBVIOUS IN POLITICAL SCIENCE. Free Press, 1976.
- Brams, Steven J. THE PRESIDENTIAL ELECTION GAME. Yale University Press, 1978.
- Brams, Steven J. SUPERIOR BEINGS: IF THEY EXIST, HOW WOULD WE KNOW? GAME-THEORETIC IMPLICATIONS OF OMNISCIENCE, OMNIPOTENCE, IMMORTALITY, AND INCOMPREHENSIBILITY. Springer-Verlag, 1983.
- Brams, Steven J. SUPERPOWER GAMES: APPLYING GAME THEORY TO SUPERPOWER CONFLICT. Yale University Press, 1985.
- Brams, Steven J., and Peter C. Fishburn. APPROVAL VOTING. Birkhäuser Boston, 1983.
- Brams, Steven J., and D. Marc Kilgour. GAME THEORY AND NATIONAL SECURITY. Basil Blackwell, 1988.
- Brams, Steven J., and Alan D. Taylor. FAIR DIVISION: FROM CAKE-CUTTING TO DISPUTE RESOLUTION. Cambridge University Press, 1996.
- Brandenburger, Adam, and Barry J. Nalebuff. CO-OPETITION. New York: Doubleday, 1996.
- Chwe, Michael Suk-Young. RATIONAL RITUAL: CULTURE, COORDINATION, AND COMMON KNOWLEDGE. Princeton University Press, 2001.
- Colman, Andrew. GAME THEORY AND ITS APPLICATIONS IN THE SOCIAL AND BIOLOGICAL SCIENCES, 2nd ed. Butterworth, Heinemann, 1995.
- Colomer, Josep M. STRATEGIC TRANSITIONS: GAME THEORY AND

- DEMOCRATIZATION. Johns Hopkins University Press, 2000.
- Congleton, Roger D., and Birgitta Swedenborg (eds.). DEMOCRATIC CONSTITUTIONAL DESIGN AND PUBLIC POLICY: ANALYSIS AND EVIDENCE. Cambridge University Press, 2006.
- Coughlin, Peter. PROBABILISTIC VOTING THEORY. Cambridge University Press, 1992.
- Cox, Gary W. MAKING VOTES COUNT: STRATEGIC COORDINATION IN THE WORLD'S ELECTORAL SYSTEMS. Cambridge University Press, 1997.
- Crossman, Ross. EVOLUTIONARY DYNAMICS AND EXTENSIVE FORM GAMES. MIT Press, 2003.
- Curriel, Imma. COOPERATIVE GAME THEORY AND APPLICATIONS: COOPERATIVE GAMES ARISING FROM COMBINATORIAL OPTIMIZATION PROBLEMS. Kluwer Academic, 1997.
- Downs, Anthony. AN ECONOMIC THEORY OF DEMOCRACY. New York: Harper, 1957.
- Symposium: Economics of Voting.* JOURNAL OF ECONOMIC PERSPECTIVES 9, no. 1 (Winter 1995): 3-98.
- Enelow, James M., and Melvin J. Hinich (eds.). ADVANCES IN THE SPATIAL THEORY OF VOTING. Cambridge University Press, 1990.
- Farquharson, Robin. THEORY OF VOTING. Yale University Press, 1969.
- Felsenthal, Dan S., and Moshé Machover. THE MEASUREMENT OF VOTING POWER: THEORY AND PRACTICE, PROBLEMS AND PARADOXES. Edward Elgar, 1998.
- Fudenberg, Drew, and David K. Levine. THE THEORY OF LEARNING IN GAMES. MIT Press, 1998.
- Garfinkel, Michelle R., and Setergios Skaperdas (eds.). THE POLITICAL ECONOMY OF CONFLICT AND APPROPRIATION. Cambridge University Press, 1997.
- Gates, Scott, and Brian D. Humes. GAMES, INFORMATION, AND POLITICS: APPLYING GAME THEORETIC MODELS TO POLITICAL SCIENCE. University of Michigan Press, 1997.
- Ghemawat, Pankaj. GAMES BUSINESSES PLAY: CASES AND MODELS. MIT Press, 1997.
- Gilboa, Itzhak, and David Schmeidler. A THEORY OF CASE-BASED DECISIONS.

Cambridge University Press, 2001.

- Green, Donald P., and Ian Shapiro. *PATHOLOGIES OF RATIONAL CHOICE THEORY: A CRITIQUE OF APPLICATIONS IN POLITICAL SCIENCE*. Yale University Press, 1994.
- Grillidi Cortona, Pietro. *EVALUATION AND OPTIMIZATION OF ELECTORAL SYSTEMS*. SIAM, 1999.
- Hanley, Nick, and Henk Folmer (eds.). *GAME THEORY AND THE ENVIRONMENT*. Edward Elgar, 1998.
- Haufbauer, Josef, and Karl Sigmund. *EVOLUTIONARY GAMES AND POPULATION DYNAMICS*. Cambridge University Press, 1998.
- Hinich, Melvin J., and Michael C. Munger. *ANALYTICAL POLITICS*. Cambridge University Press, 1997.
- Hodge, Jonathan K., and Richard E. Klima. *THE MATHEMATICS OF VOTING AND ELECTIONS: A HANDS-ON APPROACH*. American Mathematical Society, 2005.
- Howard, Nigel. *PARADOXES OF RATIONALITY: THEORY OF METAGAMES AND POLITICAL BEHAVIOR*. MIT Press, 1971.
- Kaminski, Marek M. *GAMES PRISONERS PLAY: THE TRAGICOMIC WORLDS OF POLISH PRISON*. Princeton University Press, 2004.
- Kolm, Serge-Christophe. *MODERN THEORIES OF JUSTICE*. MIT Press, 1996.
- Kreps, David M. *GAME THEORY AND ECONOMIC MODELLING*. Oxford University Press, 1990.
- Kuhn, Harold W. (ed.). *CLASSICS IN GAME THEORY*. Princeton University Press, 1997.
- Landany, Shaul P., and Robert E. Machol (eds.). *OPTIMAL STRATEGIES IN SPORTS*. North Holland, 1970.
- Laver, Michael. *PRIVATE DESIRES, POLITICAL ACTION: AN INVITATION TO THE POLITICS OF RATIONAL CHOICE*. Sage, 1997.
- McDonald, John. *THE GAME OF BUSINESS*. Doubleday, 1975.
- Mackie, Gerry. *DEMOCRACY DEFENDED*. Cambridge University Press, 2003.
- McLean, Iain, and Arnold B. Urken (eds.). *CLASSICS OF SOCIAL CHOICE*. University of Michigan Press, 1995.

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- Méro, László. MORAL CALCULATIONS: GAME THEORY, LOGIC, AND HUMAN FRAILITY. Copernicus/Springer-Verlag, 1998.
- Merrill, Samuel, III. MAKING MULTICANDIDATE ELECTIONS MORE DEMOCRATIC. Princeton University Press, 1988.
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- Milgrom, Paul. PUTTING AUCTION THEORY TO WORK. Cambridge University Press, 2004.
- Miller, Nicholas R. COMMITTEES, AGENDAS, AND VOTING. Harwood Academic, 1995.
- Mor, Ben D. DECISION AND INTERACTION IN CRISIS: A MODEL OF INTERNATIONAL CRISIS BEHAVIOR. Praeger, 1993.
- Moulin, Hervé. COOPERATIVE MICROECONOMICS: A GAME-THEORETIC INTRODUCTION. Princeton University Press, 1995.
- Moulin, Hervé J. FAIR DIVISION AND COLLECTIVE WELFARE. MIT Press, 2003
- Mueller, Dennis C. (ed.). PERSPECTIVES ON PUBLIC CHOICE: A HANDBOOK. Cambridge University Press, 1997.
- Mueller, Dennis C. PUBLIC CHOICE III. Cambridge University Press, 2003.
- Muthoo, Abhinay. BARGAINING THEORY WITH APPLICATIONS. Cambridge University Press, 1999.
- Muzzio, Douglas. WATERGATE GAMES: STRATEGIES, CHOICES, OUTCOMES. New York University Press, 1982.
- Nasar, Sylvia. A BEAUTIFUL MIND. Simon and Schuster, 1998.
- Nurmi, Hannu. COMPARING VOTING SYSTEMS. D. Reidel, 1987.
- Nurmi, Hannu. RATIONAL BEHAVIOUR AND THE DESIGN OF INSTITUTIONS: CONCEPTS, THEORIES, AND MODELS. Edward Elgar, 1998.
- Nurmi, Hannu. VOTING PARADOXES AND HOW TO DEAL WITH THEM. Berlin: Springer-Verlag, 1999.
- O'Neill, Barry. HONOR, SYMBOLS, AND WAR. University of Michigan Press, 1999.

- Ostrom, Elinor. GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION. Cambridge University Press, 1990.
- Parsons, Simon, Piotr Gmytrasiewicz, and Michael Wooldridge (eds.). GAME THEORY AND DECISION THEORY IN AGENT-BASED SYSTEMS. Kluwer, 2002.
- Poundstone, William. PRISONER'S DILEMMA: JOHN VON NEUMANN, GAME THEORY, AND THE PUZZLE OF THE BOMB. Doubleday, 1992.
- Riker, William H. THE ART OF POLITICAL MANIPULATION. Yale University Press, 1986.
- Riker, William H. LIBERALISM AGAINST POPULISM: A CONFRONTATION BETWEEN THE THEORY OF DEMOCRACY AND THE THEORY OF SOCIAL CHOICE. Freeman, 1982.
- Riker, William H. THE STRATEGY OF RHETORIC. Yale University Press, 1996.
- Riker, William H. THE THEORY OF POLITICAL COALITIONS. Yale University Press, 1962.
- Robertson, Jack, and William Webb. CAKE-CUTTING ALGORITHMS: BE FAIR IF YOU CAN. A K Peters, 1998.
- Roemer, John E. THEORIES OF DISTRIBUTIVE JUSTICE. Harvard University Press, 1996.
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- Sandler, Todd. COLLECTIVE ACTION: THEORY AND APPLICATIONS. University of Michigan Press, 1992.
- Schelling, Thomas C. MICROMOTIVES AND MACROBEHAVIOR. Norton, 1978.
- Schelling, Thomas C. THE STRATEGY OF CONFLICT. Harvard University Press, 1960.
- Shepsle, Kenneth A., and Mark S. Bonchek. ANALYZING POLITICS: RATIONALITY, BEHAVIOR, AND INSTITUTIONS. W. W. Norton, 1997.
- Sigmund, Karl. GAMES OF LIFE: EXPLORATIONS IN ECOLOGY, EVOLUTION,

- AND BEHAVIOR. Oxford University Press, 1993.
- Skyrms, Brian. EVOLUTION OF THE SOCIAL CONTRACT. Cambridge University Press, 1996.
- Taylor, Alan D. MATHEMATICS AND POLITICS: STRATEGY, VOTING, POWER, AND PROOF. Springer-Verlag, 1995.
- Taylor, Alan D. SOCIAL CHOICE AND THE MATHEMATICS OF MANIPULATION. Cambridge University Press, 2005.
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- Tsebelis, George. NESTED GAMES: RATIONAL CHOICE IN COMPARATIVE POLITICS. University of California Press, 1990.
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- Vajda, Steven. MATHEMATICAL GAMES AND HOW TO PLAY THEM. Ellis Horwood, 1992.
- Weintraub, E. Roy (ed.). TOWARD A HISTORY OF GAME THEORY. Duke University Press, 1992.
- Wittman, Donald. THE MYTH OF DEMOCRATIC FAILURE: WHY POLITICAL INSTITUTIONS ARE EFFICIENT. University of Chicago Press, 1995.
- Young, Peyton. EQUITY IN THEORY AND PRACTICE. Princeton University Press, 1994.
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- Zagare, Frank C., and D. Marc Kilgour. PERFECT DETERRENCE. Cambridge University Press, 2000.
- Zeckhauser, Richard J., Ralph L. Keeney, and James K. Sebenius (eds.). WISE CHOICES: DECISIONS, GAMES, AND NEGOTIATIONS. Harvard Business School Press, 1996.