

Topics on Microeconomic Theory

by

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This course attempts to give preliminary and selective introduction on Evolutionary Game Theory and Learning in Games. The main textbook is: *Individual Strategy and Social Structure—An Evolutionary Theory of Institute*, by Peyton Young.

Course Arrangements: A series of lectures on evolutionary game theory and paper presentations by participants.

Outlines of Lectures

1. Overview
2. Varieties of Learning Behaviour
3. Fictitious Play
4. Brief Introduction on Markov Processes
5. Dynamic and Stochastic Stability
6. Adaptive Learning and Small Games
7. Variations on the Learning Process
8. Local Interaction
9. Equilibrium and Disequilibrium Selection in General Games
10. Bargaining
11. Contracts

Evaluation: (1) Paper presentations/Lecture (50%) and (2) Reports/Comments on presentation given by one of your classmates >>> **NOT YOUR OWN** (50%).

References

I. Evolutionary Game Theory

(1) Books

Boyd and Peter Richerson (1985): *Culture and the Evolutionary Process*

Boyd and Peter Richerson (2005): *Not by Genes Alone: How Culture*

Transformed Human Evolution

Boyd and Peter Richerson (2005): *The Origin and Evolution of Cultures*

Cressman (2003): *Evolutionary Dynamics and Extensive Form Games*

Fudenberg and Levine (1998): *The Theory of Learning in Game*

Fudenberg and Tirole (1991): *Game Theory*

Maynard Smith (1982): *Evolution and the Theory of Games*

Weibull (1995): *Evolutionary Game Theory*

Young (1998): *Individual Strategy and Social Structure*

Young (2004): *Strategic Learning and its Limits*

(2) Papers (*The Reading List for Paper Presentation will be given in due course*)

Borgers and Sarin (1997): "Learning Through Reinforcement and Replicator Dynamics," *Journal of Economic Theory* **77**, 1-14.

Ellison and Fudenberg (1993): "Rules of Thumb for Social Learning," *Journal of Political Economy*, **101**, 612-643.

Ellison and Fudenberg (1995): "Word-of-Mouth Communication and Social Learning," *Quarterly Journal of Economics*, **110**, 1, 93-125.

Ely and Yilankaya (2001): "Nash Equilibrium and the Evolution of Preferences," *Journal of Economic Theory*, **97**, 255-272.

Heller (2004): "An Evolutionary Approach to Learning in a Changing Environment," *Journal of Economic Theory*, **114**, 31-55.

Juang (2001): "Learning from Popularity," *Econometrica*, **69**, 735-747.

Juang (2002): "Rule Evolution and Equilibrium Selection," *Games and Economic Behavior*, **39**, 71-90.

Kandori, M., Mailath, R., and Rob, R. (1993): "Learning, Mutation and Long Run Equilibria in Games," *Econometrica*, **61**, 29-56.

Kandori, M., and Rob, R. (1995): "Evolution of Equilibria in the Long Run: A General Theory and Applications," *Journal of Economic Theory*, **65**, 383-414.

Lambson and Probst (2004): "Learning by Matching Patterns," *Games and Economic Behavior*, **46**, 398-409.

Robson, A. J., and Vega-Redondo, F. (1996): "Efficient Equilibrium Selection in Evolutionary Games with Random Matching," *Journal of Economic Theory* **70**, 65-92.

Young, P. (1993): "The Evolution of Conventions," *Econometrica*, **61**, 57-84.

II. Networks (We will talk about this part if possible!)

- Allen, F. and D. Gale (2000), "Financial Contagion," *Journal of Political Economy*, 108, 1-33.
- Aumann, R. and Myerson, R. (1988), "Endogenous Formation of Links Between Players and Coalitions: An Application of the Shapley Value," In: Roth, A (ed.) *The Shapley Value*, Cambridge University Press, 175-191.
- Bala, V. and Goyal, S. (2000a) "A non-cooperative model of network formation," *Econometrica*, 68, pp 1181-1230.
- Calvó-Armengol, A. (2004), "Job Contact Networks," *Journal of Economic Theory* 115, 191-206.
- Calvó-Armengol, A. and M.O. Jackson (2004), "The Effects of Social Networks on Employment and Inequality," *American Economic Review*, vol. 94, no. 3, 426-454, June.
- Calvó-Armengol, A. and M.O. Jackson (2005), "Like Father, Like Son: Labor Market Networks and Social Mobility," California Institute of Technology Working Paper, <http://www.hss.caltech.edu/~jacksonm/mobility.pdf>, .
- Demange, G. (2004), "On group stability in hierarchies and networks," *Journal of Political Economy*.
- Dutta, B., S. Ghosal, and D. Ray (2003), "Farsighted Network Formation," forthcoming: *Journal of Economic Theory*.
- Dutta, B., and Mutuswami, S. (1997), "Stable Networks," *Journal of Economic Theory*, 76, 322-344.
- Ellison, G. (1993), "Learning, Local Interaction, and Coordination," *Econometrica*, 61, 1047-1071.
- Ellison, G. and Fudenberg, D. (1995), "Word-of-Mouth Communication and Social Learning," *The Quarterly Journal of Economics*, 110, 93-126.
- Goyal, S. and Vega-Redondo, F. (2005), "Learning, Network Formation and Coordination," *Games and Economic Behavior*.
- Haller, H. and Sarangi, S. (2005), "Nash Networks with Heterogeneous Links," *Mathematical Social Sciences*, 50, 181-201.
- Jackson, M.O. (2004), "A Survey of Model of Network Formation: Stability and Efficiency," in *Group Formation in Economics; Networks, Clubs and Coalitions*, edited by Gabrielle Demange and Myrna Wooders, Cambridge University Press: Cambridge U.K.

- Jackson, M.O. (2006), "The Economics of Social Networks," Chapter 1 in Volume I of *Advances in Economics and Econometrics, Theory and Applications: Ninth World Congress of the Econometric Society*, edited by Richard Blundell, Whitney Newey, and Torsten Persson, Cambridge University Press.
- Jackson, M.O. and Watts, A. (2002a), "The Evolution of Social and Economic Networks," *Journal of Economic Theory*, vol. 106, no.2, pp 265-295.
- Jackson, M.O. and Watts, A. (2002b), "On the Formation of Interaction Networks in Social Coordination Games," *Games and Economic Behavior*, vol. 41, no.2, pp 265-291.
- Jackson, M.O. and Wolinsky, A. (1996), "A Strategic Model of Social and Economic Networks," *Journal of Economic Theory*, vol 71, No. 1, pp 44-74.
- Morris, S. (2000), "Contagion," *Review of Economic Studies*, 67: 57-78.
- Schelling, T. (1971), "Dynamic Models of Segregation," *Journal of Mathematical Sociology*, 1, 143-186.
- Vega-Redondo, F. (2002), "Building Up Social Capital in a Changing World," mimeo: Universidad de Alicante.
- Watts, A. (2001), "A Dynamic Model of Network Formation," *Games and Economic Behavior*, 34, pp 331-341.