

Ec 517
Spring 2017
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Economics of Social Learning

Herds, fads, bubbles, unexpected revolutions can be explained by the behavior of rational individuals. This course provides the elements for an analysis which is based on the process by which each individual learns from the observation of the actions of others (social learning). The course will discuss concepts such as informational cascades, lack of common knowledge and networks. Applications will be presented mainly in economics but also in political science, history and animal behavior. Experiments will be run in class.

Prerequisite

The class is not prerequisite in economics but familiarity with simple probability calculus (including conditional probabilities, Bayes' rule, and simple properties of some distributions) is required.

Requirements

The class size, even after attrition, may not allow for individual presentations as in the previous year. There will be at least one mid-term and homeworks, which count towards the course grade. The weights will be set at the beginning of February, before the first mid-term. The first mid-term will be on February 23.

Lecture notes

There will be comprehensive lecture notes. One purpose for me in teaching the course is to rewrite, at a less technical level and with new material, my textbook (*Rational Herds*, Cambridge University Press, 2004). Hence you don't need to buy the book. The course has a web site, which is an essential tool that you should consult often.

The first chapter (first draft) is already on the web site of the course. It should give you an idea about the technical level of the course. You don't have to understand everything right now, but if you think that this is too technical, then please do not enroll in the course. There are other people who would like to get in and cannot because the class is full. Some topics in the course may be less technical. However, the probability calculus will be the central tool for a precise language in the analysis of issues.

The readings are indicative of the topics that will be presented in the course. Some of them are technical because they are written for professionals. There are included because they provide useful insights on issues and on the direction of current research. We will obviously use only the less technical part of these readings.

There will be changes in this list of readings/topics during the semester (not during the first month). If everything is perfectly prepared for the course, I will get bored, especially because I have taught the course a number of times. I need some unexpected topics and reading.

Syllabus

The references to *Rational Herds* are only indicative. Similar chapters will be found in the lecture notes.

1. Social and Rational learning

In this course, what makes our approach interesting is that imitation, herds and failures of social learning may occur when individuals are rational. We therefore have to analyze first how rational individuals (to be defined) learn from the observation of events and of the behavior of others. We will also see how the beliefs of rational individuals (about a given state of the world) must converge.

- Rational Herds, parts of Chapters 2 and 3.
- Holt, C. A. and L. T. Anderson (1996). "Classroom Games: Understanding Bayes' Rule," *The Journal of Economic Perspectives*, 10, 179-187.
- "The cultural niche: Why social learning is essential for human adaptation." Boyd, R., P. J. Richerson and J. Henrich (2011). *Proceedings of the National Academy of Sciences*.

2. Pathologies in social learning: cascades and herds

We may imitate others when we think that they know something that we don't. For example, we go to a crowded restaurants, etc... When we imitate others, we don't convey to others our own information that could be useful to others. If everyone behaves like that, no information is revealed by the behavior of individuals and there is an *informational cascade*. We will analyze rigorously the conditions under which such situation may occur with rational individuals. We will also make a distinction between cascades and herds.

Theory:

- *Rational Herds*, parts of chapters 3 and 4.

Experiments:

- "Informational Cascades in the Laboratory: Do They Occur for the Right Reasons." Huck, S. and J. Oechssler (1998), *Journal of Economic Psychology*, 21, 661-671.
- "Herding Behaviour Inside the Board: an experimental approach." González, M. R. Modernell and E. París (2006), *Corporate Governance*, 14, 388-405.
- "Limited Depth of Reasoning and Failure of Cascade Formation in the Laboratory." Kübler, D. and G. Weizsäcker (2004), *Review of Economic Studies*, 71, 425-441.

3. Waiting games for information

Consider penguins on a cliff, uncertain whether a killer whale is roaming below the surface of the ocean. They would like another penguin to jump first. (The proof is that they sometimes push each other. True story). Likewise in an economic recession, entrepreneurs may wait for good news before investing. But the good news may be investment by others. There is a waiting game where people are waiting because people

are waiting. This process and its properties can be analyzed with simple tools of game theory.

Theory:

- *Rational Herds*, parts of chapter 5.

4. Reputational herding and groupthink

Another explanation for imitation is to acquire or keep reputation. For example, we may use a politically correct language; financial analysts may think that if they may mistakes in investment, the penalty is smaller when others make the same mistakes, hence they may tend to follow similar strategies. Groupthink may have contributed to the fatal decision to launch the shuttle that exploded because of the failures its O-rings.

Theory:

- *Rational Herds*, parts of chapter 10.
- “Groupthink: Collective Delusions in Organizations and Markets,” Benabou, R. (2009).

Experiments:

- “Gregarious Analysts – Experimental Evidence for Reputational Herding.” Bedke, N. K. Bizer and M. Spiwoks (2009), *Journal of Money, Investment and Banking*, 26-36.
- “NASA and the Columbia Disaster: Decision-making by Groupthink?” Ferraris, C. (2003), *Proceedings of the 2003 Association for Business Communication Annual Convention*.

5. Herding in Finance

Financial markets have special characteristics: agents are supposed to be strongly rational; prices can provide more information than discrete actions. Nevertheless, they may be subject to “irrational exuberance”. This section investigates this issue.

Theory:

- “Rational herding in financial economics”. Devenow, A. and I. Welch (1996), *European Economic Review*, 40, 603-615.

6. Bubbles

Can bubbles in financial markets occur with rational agents? We investigate the issue from a theoretical and experimental point of view. A bubble may take place when everyone knows that there is a bubble, everyone knows that everyone knows that there is a bubble, every knows that everyone knows that.... The sentence can be repeated a large number of times, but it cannot be repeated infinitely. That defines the absence of *common knowledge*. The issue is much more general than bubbles.

Theory:

- *Rational Herds*, parts of chapter 16.

Applications

- “The Bubble Game: An Experimental Study of Speculation”. Moinas, S. and S. Pouget, (2013), *Econometrica*, 81, 1507-39.
- The game will be played in class and the results compared with the theory.

7. Coordination

Individuals may be acting together because it pays off to take the same action, independent of any information problem. For example, the penguins on the cliff (Section 3) may see the killer whale in the water, but any hungry penguin thinks that if one has to jump, it is better to jump with others, rather than being alone in front of the killer whale. An analysis of the problem shows that the situation is similar to that of fluctuations in economic activity or sudden switches in political regimes.

Theory:

- *Rational Herds*, parts of chapter 12.

Applications

- “Preference Falsification, Policy Continuity and Collective Conservatism”. Kuran, T. (1987), *Economic Journal*, 97, 642-65.
- *Private Truths, Public Lies: The Social Consequences of Preference Falsification*. Kuran, T. (1995), Cambridge University Press.

8. Networks (and introduction)

Networks is becoming a new and lively research area. How does the structure of the network of interactions influence economic outcomes? How do networks evolve?

- “Structure and Strategy in Collective Action.” Chwe, M. S.-Y. (1999), *American Journal of Sociology*, 105, 128-56.
- “Communication and Coordination in Social Networks.” Chwe, M. S.-Y. (2000), *Review of Economic Studies*, 67, 1-16.
- “The Strength of Weak Ties.” Granovetter, M. S. (1973), *American Journal of Sociology*, 78, 1360-80.
- *An introduction to the Economics of Networks*. Goyal S. (2009), (extracts).
- “An Overview of Social Networks and Economic Applications.” Jackson, M., (2010), *Handbook of Social Economics*, Elsevier Press.

9. Social learning in the animal world

Theory

- “Ants, Rationality and Recruitment”. Kirman (1993), *Quarterly Journal of Economics*, 108, 137-56.

Studies

- “Collective decision-making by ant colonies: A crowd is wise for hard tasks but not for easy ones.” Sasaki, T., Granovskiy, B., Mann, R.P., Sumpter, D.J.T. and Pratt, S.C. (2013), *Proceedings of the National Academy of Sciences*.
- “Linear recruitment leads to allocation and flexibility in collective foraging by ants.” Shaffer, Z., Sasaki, T. and Pratt, S.C. (2013), *Animal Behavior*, in press.
- “Groups have a larger cognitive capacity than individuals.” Sasaki, T. and Pratt, S.C. (2012), *Current Biology* 22: R827-R829.