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Behavioral Economics G6493-001
Fall 2018
Columbia University
Instructor: Mark Dean

Background

The standard model of economic behavior describes a perfectly rational, self-interested utility maximizer with unlimited cognitive resources. In many cases, this provides a good approximation of the types of behavior that economists are interested in. However, over the past 30 years, experimental and behavioral economists have documented ways in which the standard model is not just wrong, but is wrong in ways that are important for economic outcomes. Understanding these behaviors, and their implications, is one of the most exciting areas of current economic inquiry.

Course Overview

The aim of this course is to introduce you to four key areas of Behavioral Economics:

- Bounded Rationality, which studies the way in in which cognitive constraints and limitations can affect economic choice
- Temptation, which studies the behavior of economic agents who suffer from self-control problems due, for example, to addiction or impatience
- Context dependence, which studies the way in which decision makers assess the outcome of a choice by its contrast with a reference point or other context provided by the choice problem rather than intrinsic taste for the outcome itself.
- Risk preferences, which studies departures from the model of a decision maker who uses rational expectations and expected utility to make choices when outcomes are uncertain

This is not an exhaustive list of behavioral economic topics – for example due to time limits we will not cover models of fairness, reciprocity etc – collectively described as models of social preferences.

This course forms part of the Behavioral Economics field which will this year comprise of 3 courses. The other two are "Games in the Lab" which will be taught by Alessandra Casella in the Fall and "Recent Advances in Bounded Rationality" which will be taught by Kfir Elaiz (a visitor from Tel Aviv) in the spring. We have worked to try to make these courses complementary – Alessandra will focus more on strategic interactions and game theory, while Kfir will focus more specifically on applications of bounded rationality.

For each of the topic areas covered by the course, we will begin by discussing the evidence that the standard economic model is missing something important. We will then study the various models that have been used to fit this evidence, and how they can be tested. Finally we will look at the application of behavioral models to economic situations in order to understand their implications beyond the narrow

world of behavioral economics (typically you will read the papers for this last section on your own to present to the class – see below)

The course will draw on materiel from many areas related to behavioral economics. Experimental economics will provide us with much of the evidence that we discuss. Decision theory will allow us to understand the observable implications of behavioral models, and so how to test them. Psychology will provide a lot of insight and enormous amounts of data regarding human behavior. Neuroscience will provide an understanding of some of the biological processes which underlie economic choice.

The course has four main aims.

1. Teach you the technical skills necessary to understand and begin research in behavioral economics
2. Provide an overview of the experimental evidence related to bounded rationality, temptation, reference dependence and risk preferences, and give you the tools necessary to conduct experimental research into the validity of behavioral economic models
3. Describe the models that have been developed in these areas, and show how they can be applied to address broader economic problems
4. Give a guide to some of the open questions in the literature, where research may fruitfully undertaken

Assessment

Assessment for the course will be based on two elements

1. **Presentations:** Most weeks, every member of the class will be required to prepare a 15 minute presentation on an assigned paper. One person will be selected at random to give the presentation in class.

2. **Problem Sets:** There will be four problem sets during the class, one in the for each of the topics

Each of the problem sets and the classroom presentations will carry roughly equal weight.

Prerequisites

The course is primarily designed for graduate students who have taken the 1st year microeconomics sequence. It is also possible for others to take the course if they are keen, and have a decent technical background. However, such students take the course do so at their own risk.

Course Materials

By and large, the course will be based on academic papers (which are available online) and lecture notes (which I will make available). There are a few books that you may find useful. The first is "Notes on the Theory of Choice" by David Kreps, which is a deceptively simple book that provides a fantastic

introduction to classical decision theory. The second is "Elements of Information Theory" by Thomas Cover and Joy Thomas, which will be useful for those of you interested in the literature on rational Inattention. A third is "Neuroeconomics, Decision Making and the Brain" by Paul Glimcher and Ernst Fehr (eds) which, as its name suggests, will be interesting to those of you who are more interested in the neuroeconomics side of things.

Administrative Details

The class will meet on Fridays between 10.10 and 12.00 in room 1102 in the International Affairs Building.

Office hours will be Tuesdays 10.00am- 12.00pm, though I will be available outside these times if you contact me in advance.

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Timetable

7th September: Lecture 1: Introduction.

Aims

- Say hello to each other!
- Lay theoretical groundwork for the course by explaining why representation theorems are useful for testing models that come from behavioral economics
- Provide refresher on the classic representation theorems for utility maximization
- Talk through issues that come about when testing representation theorems in practice – namely goodness of fit and power
- (If time) talk through some classic failures of utility maximization

Key readings

- '"Notes on the Theory of Choice", David Kreps, Chapter 1-3
- Varian, Hal R. "Revealed preference." Samuelsonian economics and the twenty-first century (2006): 99-115.
- Dean, Mark, and Daniel Martin. "Measuring rationality with the minimum cost of revealed preference violations." Review of Economics and Statistics 98.3 (2016): 524-534.

Paper for presentation:

- Beatty, Timothy K. M., and Ian A. Crawford. "How Demanding Is the Revealed Preference Approach to Demand?" The American Economic Review, vol. 101, no. 6, 2011, pp. 2782–2795.

14th September: Lecture 2: Bounded Rationality 1: Inattention, Consideration Sets and Satisficing

Aims

- Introduce the concept of bounded rationality and the related field of limited attention, and the issues that they are trying to solve
- Provide an overview of the various approaches that have been taken to modelling inattention
- Introduce two models of limited attention: consideration sets and satisficing
- Describe the issues associated with testing these models, and the various solutions that have been proposed
- Describe the evidence for these models

Key readings

- Gabaix, X, "Behavioral Inattention" (2017), a chapter prepared for the Handbook of Behavioral Economics (edited by Douglas Bernheim, Stefano DellaVigna and David Laibson).
- Handel, Benjamin, and Joshua Schwartzstein. "Frictions or Mental Gaps: What's Behind the Information We (Don't) Use and When Do We Care?." Journal of Economic Perspectives 32.1 (2018): 155-78.
- Caplin, Andrew, Mark Dean, and Daniel Martin. "Search and satisficing." The American Economic Review (2011): 2899-2922
- Abaluck, Jason, and Abi Adams. What do consumers consider before they choose? Identification from asymmetric demand responses. No. w23566. National Bureau of Economic Research, 2017.

Paper for presentation:

- Taubinsky, Dmitry, and Alex Rees-Jones. Attention variation and welfare: theory and evidence from a tax salience experiment. Vol. 22545. National Bureau of Economic Research, 2016.

21st September: Lecture 3: Bounded Rationality 2: Rational Inattention 1

Aims

- Introduce the model of rational inattention as an important workhorse model for characterizing behavior when attention is limited
- Describe how to test a model of rational inattention when information costs are unknown
- Discuss the relevant experimental evidence

Key readings

- Caplin, Andrew, and Mark Dean. "Revealed preference, rational inattention, and costly information acquisition." The American Economic Review 105.7 (2015): 2183-2203.
- Oliveira, Henrique, et al. "Rationally inattentive preferences and hidden information costs." Theoretical Economics 12.2 (2017): 621-654.
- Dean, Mark, and Nathaniel Neligh. Experimental tests of rational inattention. Working Paper, Columbia University, 2017.

Paper for presentation:

- Bartoš, Vojtěch, et al. "Attention Discrimination: Theory and Field Experiments with Monitoring Information Acquisition." American Economic Review 106.6 (2016): 1437-1475.

28th September: Lecture 4: Bounded Rationality 3: Rational Inattention 2

Aims

- Introduce the concept of Shannon mutual information as a cost of information, which is extremely popular in the applied literature
- Discuss how to solve the rational inattention model with Shannon costs
- Discuss the relevant experimental evidence, and how the Shannon model can be modified to make better predictions

Key readings

- Matejka, Filip, and Alisdair McKay. "Rational inattention to discrete choices: A new foundation for the multinomial logit model." American Economic Review 105.1 (2015): 272-98.
- Mackowiak, Bartosz, Filip Matejka, and Mirko Wiederholt. "Rational Inattention: A Disciplined Behavioral Model.", working paper (2018).
- Hébert, Benjamin, and Michael Woodford. Rational inattention and sequential information sampling. No. w23787. National Bureau of Economic Research, 2017.Paper for presentation
- Caplin, Andrew, Dean Mark and Leahy, John "Rationally Inattentive Behavior: Characterizing and Generalizing Shannon Entropy", Working Paper, 2017

Paper for presentation:

- Gabaix, Xavier. "A sparsity-based model of bounded rationality." The Quarterly Journal of Economics 129.4 (2014): 1661-1710.

5th October: Lecture 5: Temptation and Self Control 1: Introduction to Temptation and Self Control

Aims

- Describe why problems of temptation and self control are important for economics
- Describe two key modeling approaches – preference for commitment and time inconsistency
- Begin to discuss models on menu preferences as an introduction to modelling commitment

Key readings

- Moffitt, Terrie E., et al. "A gradient of childhood self-control predicts health, wealth, and public safety." Proceedings of the National Academy of Sciences 108.7 (2011): 2693-2698.
- Mani, Anandi, et al. "Poverty impedes cognitive function." science 341.6149 (2013): 976-980.
- Kreps, David M. "A representation theorem for" preference for flexibility"." *Econometrica: Journal of the Econometric Society*(1979): 565-577.

Paper for presentation:

- Allcott, Hunt, Benjamin B. Lockwood, and Dmitry Taubinsky. "Regressive Sin Taxes, with Applications to the Optimal Soda Tax." (2018).

12th October: Lecture 6: Temptation and Self Control 2: Models of Commitment and Time Inconsistency

Aims

- Describe the Gul-Pesendorfer model of temptation and self control as a model of commitment
- Describe models of non-exponential discounting which allow for time inconsistency
- Describe the links between the two

Key readings

- Lipman, Barton L., and Wolfgang Pesendorfer. Temptation. No. WP2010-021. Boston University-Department of Economics, 2010.

- Laibson, David. "Golden eggs and hyperbolic discounting." The Quarterly Journal of Economics (1997): 443-477.
- Olea, José Luis Montiel, and Tomasz Strzalecki. "Axiomatization and measurement of quasi-hyperbolic discounting." The Quarterly Journal of Economics 129.3 (2014): 1449-1499.

Paper for presentation:

- Eliaz, Kfir, and Ran Spiegler. "Contracting with diversely naive agents." The Review of Economic Studies 73.3 (2006): 689-714.

19th October: Lecture 7: Temptation and Self Control 3: Evidence for Commitment and Time Inconsistency

Aims

- Describe when and where people exhibit preference for commitment
- Describe when and where people exhibit time inconsistency
- Ask why people might not exhibit as much preference for commitment as we might think

Key readings

- Augenblick, Ned, Muriel Niederle, and Charles Sprenger. "Working Over Time: Dynamic Inconsistency in Real Effort Tasks*." The Quarterly Journal of Economics (2015): qjv020.
- Kaur, Supreet, Michael Kremer, and Sendhil Mullainathan. "Self-control at work." Journal of Political Economy 123.6 (2015): 1227-1277
- Toussaert, Séverine. "Eliciting Temptation and Self-Control Through Menu Choices: A Lab Experiment." *Econometrica*86.3 (2018): 859-889.

Paper for presentation:

- Angeletos, George-Marios, et al. "The hyperbolic consumption model: Calibration, simulation, and empirical evaluation." Journal of Economic Perspectives 15.3 (2001): 47-68.

26th October: Lecture 8: Context Dependence 1: Evidence for Reference and Context Dependence

Aims

- Describe what it means for choice to be 'context dependent', and why it violates the standard model
- Introduce evidence for the fact that behavior depends on a reference point
- Introduce evidence that choices depend on context (in the form of the choice set) more generally

Key readings

- Kahneman, Daniel, Jack L. Knetsch, and Richard H. Thaler. "Anomalies: The endowment effect, loss aversion, and status quo bias." The journal of economic perspectives (1991): 193-206.
- Isoni, Andrea, Graham Loomes, and Robert Sugden. "The Willingness to Pay—Willingness to Accept Gap, the" Endowment Effect," Subject Misconceptions, and Experimental Procedures for Eliciting Valuations: Comment." *American Economic Review* 101.2 (2011): 991-1011.
- Lea, Amanda M., and Michael J. Ryan. "Irrationality in mate choice revealed by túngara frogs." Science 349.6251 (2015): 964-966.

Paper for presentation:

- Thaler, Richard H., and Shlomo Benartzi. "Save more tomorrow™: Using behavioral economics to increase employee saving." Journal of political Economy 112.S1 (2004): S164-S187.

2nd November: Lecture 9: Context Dependence 2: Models of Reference Dependence

Aims

- Describe two of the most influential models of reference dependent behavior
  - Prospect Theory
  - The Koszegi Rabin Model
- Discuss the question of where reference points come from

Key readings

- Kőszegi, Botond, and Matthew Rabin. "A model of reference-dependent preferences." The Quarterly Journal of Economics (2006): 1133-1165.
- Tversky, Amos, and Daniel Kahneman. "Loss aversion in riskless choice: A reference-dependent model." The quarterly journal of economics 106.4 (1991): 1039-1061.
- Ok, Efe A., Pietro Ortoleva, and Gil Riella. "Revealed (p) reference theory." *American Economic Review* 105.1 (2015): 299-321.

Paper for presentation:

- DellaVigna, Stefano, et al. "Reference-dependent job search: Evidence from Hungary." The Quarterly Journal of Economics 132.4 (2017): 1969-2018.

9th November: Lecture 10: Context Dependence 10: Models of Choice Set Dependent Choice

Aims

- Introduce four key models of the way in which the set of available options can affect the choices that people make
  - Salience
  - Range Normalization
  - Focusing
  - Learning

Key readings

- Natenzon, Paulo. "Random choice and learning." Working paper 2017
- Bordalo, Pedro, Nicola Gennaioli, and Andrei Shleifer. "Salience Theory of Choice Under Risk." The Quarterly journal of economics 127.3 (2012): 1243-1285.
- Kőszegi, Botond, and Adam Szeidl. "A model of focusing in economic choice." The Quarterly Journal of Economics 128.1 (2013): 53-104.
- Louie, Kenway, Mel W. Khaw, and Paul W. Glimcher. "Normalization is a general neural mechanism for context-dependent decision making." Proceedings of the National Academy of Sciences 110.15 (2013): 6139-6144.

Paper for presentation:

- Bordalo, Pedro, Nicola Gennaioli, and Andrei Shleifer. "Salience and Consumer Choice." Journal of Political Economy 121.5 (2013): 803-843.

16th November: Lecture 11: Risk and Uncertainty 1: Expected Utility and its Violations

Aims

- Provide a refresher course on the models of objective and subjective expected utility

- Provide behavioral characterizations of these models
- Introduce the key pieces of laboratory evidence that show violations of expected utility

Key readings

- ‘“Notes on the Theory of Choice”, David Kreps, Chapter 5-9
- Starmer, Chris. "Developments in non-expected utility theory: The hunt for a descriptive theory of choice under risk." *Journal of economic literature* 38.2 (2000): 332-382.
- Halevy, Yoram. "Ellsberg revisited: An experimental study." *Econometrica* 75.2 (2007): 503-536.

Paper for presentation:

- Dow, James, and Sergio Ribeiro da Costa Werlang. "Uncertainty aversion, risk aversion, and the optimal choice of portfolio." Econometrica: Journal of the Econometric Society (1992): 197-204.

30th November: Lecture 12: Models of non-expected utility for risk

Aims

- Introduce four key models that relax the assumptions of expected utility in the domain of risk
    - Prospect theory and rank dependent utility
    - Regret theory
    - Disappointment aversion
    - Cautious expected utility

Key readings

- Gul, Faruk. "A theory of disappointment aversion." Econometrica: Journal of the Econometric Society (1991): 667-686.
- Loomes, Graham, and Robert Sugden. "Regret theory: An alternative theory of rational choice under uncertainty." The economic journal 92.368 (1982): 805-824.
- Tversky, Amos, and Daniel Kahneman. "Advances in prospect theory: Cumulative representation of uncertainty." Journal of Risk and uncertainty 5.4 (1992): 297-323.
- Cerreia-Vioglio, Simone, David Dillenberger, and Pietro Ortoleva. "Cautious expected utility and the certainty effect." Econometrica 83.2 (2015): 693-728.

Paper for presentation:

- Gill, David, and Victoria Prowse. "A structural analysis of disappointment aversion in a real effort competition." *American Economic Review* 102.1 (2012): 469-503.

7th December: Lecture 13: Models of non-expected utility for uncertainty

Aims

- Introduce three key models that relax the assumptions of expected utility in the domain of uncertainty
    - Max-min
    - Variational Preferences
    - Smooth model of ambiguity aversion
- Discuss the evidence for overconfidence as a violation of rational expectations

Key readings

- Schmeidler, David, and Itzhak Gilboa. "Maxmin expected utility with non-unique prior." Uncertainty in Economic Theory. Routledge, 2004. 141-151.Loomes, Graham, and Robert

- Strzalecki, Tomasz. "Axiomatic foundations of multiplier preferences." Econometrica 79.1 (2011): 47-73.
- Klibanoff, Peter, Massimo Marinacci, and Sujoy Mukerji. "A smooth model of decision making under ambiguity." Econometrica 73.6 (2005): 1849-1892.
- Ortoleva, Pietro, and Erik Snowberg. "Overconfidence in political behavior." American Economic Review 105.2 (2015): 504-35