

Behavioral Economics G6493-001

Spring 2015

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 three key areas of Behavioral Economics:

- Bounded Rationality, which studies the way 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
- Reference Dependence, which studies the way in which people assess the outcome of a choice by its contrast with a reference point rather than intrinsic taste for the outcome itself.

This is not an exhaustive list of behavioral economic topics, and the course is designed to be complimentary to others at Columbia. Social preferences (for example fairness and reciprocity) will be covered by Alessandra Casella's course (G6492) in Spring 2016. (My and Alessandra's courses form this year's field sequence in Behavioral Economics.) Pietro Ortoleva's course (G6219), scheduled for 2016/2017 will cover behavioral models of choice under risk and uncertainty, as well as non-Bayesian learning. Mike Woodford's course (G6220), also scheduled for 2016/17, will discuss macroeconomic applications of the models of bounded rationality I introduce in this course.

For each of the three 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 approaches that have been used to fit this evidence, and how these models can be tested. Finally we will look at the application of behavioral models to economic situations in order to understand their implications.

The course will draw on material 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. Neuroeconomics 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 and reference dependent 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 have been applied more widely in the economics literature
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:** Approximately every other week, 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. **Exams:** There will be three take home exams (or problem sets) during the class, one in the for each of the topics

Each of the exams 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. However, 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 Wednesdays between 2.10 and 4.00 in 1102 in the international affairs building.

Office hours will be Mondays 4.00pm-6.00pm, though I will be available outside these times if you contact me in advance.

My contact details are as follow:

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Website: TBD (lecture notes will be posted here)

Timetable

Following an introductory lecture, the course will be split into three sections: Bounded rationality, temptation and self control, and reference dependence. As is typical for second year topics courses, the material is constantly evolving, so the following plan may change over the course of the semester, as will the reading list. The latest version of the plan will be uploaded to the course website.

9th September. Lecture 1: Introduction. As well as getting to know each other, we will have a refresher course on the behavioral implications of utility maximization. This will be handy because we will make use of some of the techniques later on. We will also discuss some of the classic failures of utility maximization which will motivate the section of the course on bounded rationality.

- *Key reading (s):* Unlike many other lectures in the course, this lecture will quickly cover material from a number of different papers, so there is no key readings as such. However, two excellent sources covering revealed preference and the testing of utility maximization are
 - “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.
- *Class presentation (to be prepared for the following week)*
 - Choi, Syngjoo, et al. "Who is (more) rational?." The American Economic Review 104.6 (2014): 1518-1550
- *.Background Reading*
 - Echenique, Federico, Sangmok Lee, and Matthew Shum. "The money pump as a measure of revealed preference violations." Journal of Political Economy 119.6 (2011): 1201-1223.
 - Beatty, Timothy KM, and Ian A. Crawford. "How demanding is the revealed preference approach to demand?." The American Economic Review 101.6 (2011): 2782-2795.

- o "Revealed Preference, Rational Inattention, and Costly Information Acquisition"
Andrew Caplin and Mark Dean, Mimeo, 2014 (note this is the working paper, not the AER article. You want to have a look at the experimental section)
- o Caplin, Andrew, Mark Dean, and Daniel Martin. "Search and satisficing." *The American Economic Review* (2011): 2899-2922. (Again, you want the experimental section)
- o Abaluck, J., and J. Gruber. "Choice Inconsistencies Among the Elderly: Evidence from Plan Choice in the Medicare Part D Program." *The American economic review* 101.4 (2011): 1180-1210.
- o Iyengar, Sheena S., and Mark R. Lepper. "When choice is demotivating: Can one desire too much of a good thing?." *Journal of personality and social psychology* 79.6 (2000): 995.
- o Huber, Joel, John W. Payne, and Christopher Puto. "Adding asymmetrically dominated alternatives: Violations of regularity and the similarity hypothesis." *Journal of consumer research* (1982): 90-98.
- o Simonson, Itamar. "Choice based on reasons: The case of attraction and compromise effects." *Journal of consumer research* (1989): 158-174.
- o Bushong, Benjamin, et al. "Pavlovian processes in consumer choice: The physical presence of a good increases willingness-to-pay." *The American economic review* 100.4 (2010): 1556-1571.
- o Chetty, Raj, Adam Looney, and Kory Kroft. "Salience and Taxation: Theory and Evidence." *The American Economic Review* 99.4 (2009): 1145.
- o Tversky, Amos, and Daniel Kahneman. "The framing of decisions and the psychology of choice." *Science* 211.4481 (1981): 453-458.

16th September. Lecture 2: Bounded Rationality 1 - Consideration Sets. It has long been believed by marketers and retailers that people do not seriously consider all the possible alternatives when making a choice. Instead they form a 'consideration set' of alternatives from which they choose. In this lecture we will consider some of the recent models of consideration set formation that have appeared in the economics literature

- *Key reading (s):*
 - o Caplin, Andrew, Mark Dean, and Daniel Martin. "Search and satisficing." *The American Economic Review* (2011): 2899-2922
- *Class presentation (to be prepared for the following week)*
 - o De Clippel, Geoffroy, Kfir Eliaz, and Kareen Rozen. "Competing for consumer inattention." *Journal of Political Economy* 122.6 (2014): 1203-1234.
- *Background Reading*
 - o Manzini, Paola, and Marco Mariotti. "Stochastic choice and consideration sets." *Econometrica* 82.3 (2014): 1153-1176.
 - o Masatlioglu, Yusufcan, Daisuke Nakajima, and Erkut Y. Ozbay. "Revealed attention." *The American Economic Review* (2012): 2183-2205.

- o Lleras, Juan Sebastian, et al. "When more is less: Limited consideration." Unpublished, October (2010). Eliaz and Spiegler
- o Caplin, Andrew, and Mark Dean. "Search, choice, and revealed preference." *Theoretical Economics* 6.1 (2011): 19-48.
- o Ching, Andrew, Tülin Erdem, and Michael Keane. "The price consideration model of brand choice." *Journal of Applied Econometrics* 24.3 (2009): 393-420.
- o Hauser, John R., and Birger Wernerfelt. "An evaluation cost model of consideration sets." *Journal of consumer research* (1990): 393-408.
- o Roberts, John H., and James M. Lattin. "Development and testing of a model of consideration set composition." *Journal of Marketing Research* (1991): 429-440. "Testing models of consumer search using data on web browsing and purchasing behavior."
- o De los Santos, Babur, Ali Hortaçsu, and Matthijs R. Wildenbeest. "Testing models of consumer search using data on web browsing and purchasing behavior." *The American Economic Review* 102.6 (2012): 2955-2980.
- o Eliaz, Kfir, and Ran Spiegler. "Consideration sets and competitive marketing." *The Review of Economic Studies* 78.1 (2011): 235-262.

23rd September Lecture 3: Bounded Rationality 2: Rational Inattention (1). In this lecture we begin to study the class of 'rational inattention' models that have been used to try to understand the informational choices of cognitively constrained agents. To start with, we consider the case in which information costs are not known, but instead have to be inferred from choice

- *Key reading (s):*
 - o Caplin, Andrew, and Mark Dean. "Revealed Preference, Rational Inattention, and Costly Information Acquisition." NBER Working Paper w19876 (2014)
- *.Class presentation (to be prepared for the following week)*
 - o Bartos, Vojtech, et al. "Attention Discrimination: Theory and Field Experiments with Monitoring Information Acquisition." (2014).
- *Background Reading*
 - o "Caplin, Andrew, and Daniel Martin. A testable theory of imperfect perception." *The Economic Journal* 125.582 (2015): 184-202.
 - o Ellis, Andrew. "Foundations for optimal inattention." (2013).
 - o De Oliveira, Henrique, et al. "Rationally inattentive preferences." Available at SSRN 2274286 (2013).
 - o Lu, Jay. "Random choice and private information." unpublished, Princeton University (2013).

30th September (Though this lecture may have to be moved) Lecture 4: Bounded Rationality 2: Rational Inattention (2). We continue our discussion of models of rational inattention by considering the popular special case in which the cost of information are based on the concept of Shannon Mutual Information

- *Key reading (s):*

- 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.
- Sims, Christopher A. "Implications of rational inattention." *Journal of monetary Economics* 50.3 (2003): 665-690.
- *Class presentation (to be prepared for the following week)*
 - Yang, Ming. "Coordination with flexible information acquisition." *Journal of Economic Theory* (2014).
- *Background Reading*
 - Van Nieuwerburgh, Stijn, and Laura Veldkamp. "Information immobility and the home bias puzzle." *The Journal of Finance* 64.3 (2009): 1187-1215.
 - Martin, Daniel. "Strategic pricing and rational inattention to quality." Available at SSRN 2393037 (2012).
 - Cover, Thomas M., and Joy A. Thomas, Elements of Information Theory, New York: Wiley-Interscience, 2d ed., 2006, esp. chaps. 2, 7, 10.
 - Caplin, Andrew, and Mark Dean. Behavioral implications of rational inattention with shannon entropy. No. w19318. National Bureau of Economic Research, 2013.
 - Matejka, Filip, Jakub Steiner, and Colin Stewart. Rational Inattention Dynamics: Inertia and Delay in Decision-Making. No. 10720. CEPR Discussion Papers, 2015.
 - Matejka, Filip, and Christopher A. Sims. "Discrete actions in information-constrained tracking problems." Princeton University manuscript (2010).

7th October Lecture 5: Bounded Rationality 4: Attention and weighting in multi-dimensional problems.

In this lecture we will cover a set of models which aim to understand how people focus their attention on particular aspects, or dimensions of a choice problem, and how this can affect choice

- *Key reading (s):*
 - Bordalo, Pedro, Nicola Gennaioli, and Andrei Shleifer. "Salience Theory of Choice Under Risk." *The Quarterly journal of economics* 127.3 (2012): 1243-1285.
 - Bushong, Benjamin, Matthew Rabin, and Joshua Schwartzstein. "A model of relative thinking." Unpublished manuscript, Harvard University, Cambridge, MA (2014).
- *Class presentation (to be prepared for the following week)*
 - Soltani, Alireza, Benedetto De Martino, and Colin Camerer. "A range-normalization model of context-dependent choice: a new model and evidence." *PLoS Comput Biol* 8.7 (2012): e1002607-e1002607.
- *Background Reading*
 - Parducci, Allen. "Category judgment: a range-frequency model." *Psychological review* 72.6 (1965): 407.
 - Bordalo, Pedro, Nicola Gennaioli, and Andrei Shleifer. "Salience and Consumer Choice." *Journal of Political Economy* 121.5 (2013): 803-843.

- o Cunningham, Tom. "Comparisons and choice." Unpublished Manuscript, Harvard University (2011).
- o Kőszegi, Botond, and Adam Szeidl. "A model of focusing in economic choice." *The Quarterly Journal of Economics* 128.1 (2013): 53-104.
- o Louie, Kenway, Lauren E. Grattan, and Paul W. Glimcher. "Reward value-based gain control: divisive normalization in parietal cortex." *The Journal of Neuroscience* 31.29 (2011): 10627-10639.
- o Padoa-Schioppa, Camillo. "Range-adapting representation of economic value in the orbitofrontal cortex." *The Journal of Neuroscience* 29.44 (2009): 14004-14014.
- o Rangel, Antonio, and John A. Clithero. "Value normalization in decision making: theory and evidence." *Current opinion in neurobiology* 22.6 (2012): 970-981.
- o Rubinstein, Ariel. "Similarity and decision-making under risk (Is there a utility theory resolution to the Allais paradox?)." *Journal of Economic Theory* 46.1 (1988): 145-153.
- o Woodford, Michael. "Inattentive valuation and reference-dependent choice." Unpublished Manuscript, Columbia University (2012).
- o Gabaix, Xavier, et al. "Costly information acquisition: Experimental analysis of a boundedly rational model." *The American Economic Review* (2006): 1043-1068.

14th October) Lecture 6: Bounded Rationality 5: Drift Diffusion Models. An extremely influential approach within psychology and neuroscience is to model the process of information acquisition as a sequence of signals received the decision maker until their beliefs cross a threshold, at which point a decision is made. In this class we discuss the evidence for such "drift diffusion" models

- *Key reading (s):*
 - o Busemeyer, Jerome R., and James T. Townsend. "Decision field theory: a dynamic-cognitive approach to decision making in an uncertain environment." *Psychological review* 100.3 (1993): 432.
 - o Krajbich, Ian, and Antonio Rangel. "Multialternative drift-diffusion model predicts the relationship between visual fixations and choice in value-based decisions." *Proceedings of the National Academy of Sciences* 108.33 (2011): 13852-13857.
- *Class presentation (to be prepared for the following week)*
 - o None
- *Background Reading*
 - o Webb, Ryan. "Dynamic constraints on the distribution of stochastic choice: Drift Diffusion implies Random Utility." Available at SSRN 2226018 (2013).
 - o Gold, Joshua I., and Michael N. Shadlen. "The neural basis of decision making." *Annu. Rev. Neurosci.* 30 (2007): 535-574.
 - o Ratcliff, Roger, and Gail McKoon. "The diffusion decision model: theory and data for two-choice decision tasks." *Neural computation* 20.4 (2008): 873-922.

- Krajbich, Ian, Carrie Armel, and Antonio Rangel. "Visual fixations and the computation and comparison of value in simple choice." *Nature neuroscience* 13.10 (2010): 1292-1298.

21st October (though this lecture may have to be moved) Lecture 7: Temptation and Self Control 1: An introduction to modelling temptation and self control. In this opening lecture we will discuss the intuitive evidence that there are temptation and self control problems are widespread, and the approaches that have been taken to modeling such behavior

- *Key reading (s):*
 - Gul, Faruk, and Wolfgang Pesendorfer. "Temptation and self-control." *Econometrica* (2001): 1403-1435.
 - Laibson, David. "Golden eggs and hyperbolic discounting." *The Quarterly Journal of Economics* (1997): 443-477.
- *Class presentation (to be prepared for the following week)*
 - None
- *Background Reading*
 - Muraven, Mark, and Roy F. Baumeister. "Self-regulation and depletion of limited resources: Does self-control resemble a muscle?." *Psychological bulletin* 126.2 (2000): 247.
 - Ariely, Dan, and Klaus Wertenbroch. "Procrastination, deadlines, and performance: Self-control by precommitment." *Psychological science* 13.3 (2002): 219-224.
 - Carvalho, Leandro S., Stephan Meier, and Stephanie W. Wang. "Poverty and economic decision making: evidence from changes in financial resources at payday." *Unpublished manuscript* (2014).
 - Bénabou, Roland, and Jean Tirole. "Willpower and personal rules." *Journal of Political Economy* 112.4 (2004): 848-886.

28th October Lecture 8: Temptation and Self Control 2: Models of Commitment: In this second lecture we will discuss in more detail models in which temptation leads to a preference for commitment, or a desire for smaller choice sets.

- *Key reading (s):*
 - Lipman, Barton L., and Wolfgang Pesendorfer. *Temptation*. No. WP2010-021. Boston University-Department of Economics, 2010.
- *Class presentation (to be prepared for the following week)*
 - Amador, Manuel, Iván Werning, and George-Marios Angeletos. "Commitment vs. flexibility." *Econometrica* 74.2 (2006): 365-396.
- *Background Reading*
 - Fudenberg, Drew, and David K. Levine. "A dual-self model of impulse control." *The American Economic Review* (2006): 1449-1476.
 - Galperti, Simone. "Commitment, Flexibility, and Optimal Screening of Time Inconsistency." Available at SSRN 2565171 (2012).

- Masatlioglu, Yusufcan, Daisuke Nakajima, and Emre Ozdenoren. Revealed Willpower. mimeo, 2011.

4th November: Lecture 9: Temptation and Self Control 3: Models of Non-Exponential Discounting. This lecture covers the relationship between temptation and non-exponential discounting, particular 'present bias'.

- *Key reading (s):*
 - 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.
- *Class presentation (to be prepared for the following week)*
 - DellaVigna, Stefano, and Ulrike Malmendier. "Contract design and self-control: Theory and evidence." The Quarterly Journal of Economics (2004): 353-402.
- *Background Reading*
 - Blow, Laura, Martin Browning, and Ian Crawford. Never mind the hyperbolics: nonparametric analysis of time-inconsistent preferences. No. W14/17. IFS Working Papers, 2014.
 - Harris, Christopher, and David Laibson. "Dynamic choices of hyperbolic consumers." Econometrica 69.4 (2001): 935-957.
 - Halevy, Yoram. "Strotz meets Allais: Diminishing impatience and the certainty effect." The American Economic Review (2008): 1145-1162.
 - Saito, Federico Echenique Taisuke Imai Kota. "Testable Implications of Models of Intertemporal Choice: Exponential Discounting and Its Generalizations." (2015).
 - Barro, Robert J. "Ramsey meets Laibson in the neoclassical growth model." Quarterly Journal of Economics (1999): 1125-1152.
 - Jackson, Matthew O., and Leeat Yariv. "Collective dynamic choice: the necessity of time inconsistency." Available at SSRN 1699444 (2011).
 - Eliaz, Kfir, and Ran Spiegler. "Contracting with diversely naive agents." The Review of Economic Studies 73.3 (2006): 689-714.

11th November: Lecture 10: Temptation and Self Control 4: Evidence Here we will look at the evidence for preference for commitment, present bias, and the link between the two

- *Key reading (s):*
 - Augenblick, Ned, Muriel Niederle, and Charles Sprenger. "Working Over Time: Dynamic Inconsistency in Real Effort Tasks*." The Quarterly Journal of Economics (2015): qjv020.
- *Class presentation (to be prepared for the following week)*
 - None
- *Background Reading*

- o Ashraf, Nava, Dean Karlan, and Wesley Yin. "Tying Odysseus to the mast: Evidence from a commitment savings product in the Philippines." *The Quarterly Journal of Economics* (2006): 635-672.
- o John, Anett. *When Commitment Fails-Evidence from a Regular Saver Product in the Philippines*. No. 055. Suntory and Toyota International Centres for Economics and Related Disciplines, LSE, 2014.
- o Kaur, Supreet, Michael Kremer, and Sendhil Mullainathan. "Self-Control at Work."
- o Bryan, Gharad, Dean Karlan, and Scott Nelson. "Commitment devices." *Annu. Rev. Econ.* 2.1 (2010): 671-698.
- o DellaVigna, Stefano, and Ulrike Malmendier. "Paying not to go to the gym." *The American Economic Review* (2006): 694-719.
- o Toussaert, Séverine. "Eliciting temptation and self-control through menu choices: a lab experiment on curiosity." (2015).
- o Dean, Mark, and Anja Sautmann. "Credit constraints and the measurement of time preferences." Available at SSRN 2423951 (2014).
- o Andreoni, James, and Charles Sprenger. "Estimating Time Preferences from Convex Budgets." *The American Economic Review* (2012): 3333-3356.
- o Andreoni, James, and Charles Sprenger. "Risk preferences are not time preferences." *The American Economic Review* 102.7 (2012): 3357-3376.
- o Dean, Mark, and John McNeill. *Preference for Flexibility and Random Choice: an Experimental Analysis*. No. 2014-10. 2014.
- o Halevy, Yoram. "Time consistency: Stationarity and time invariance." *Econometrica* 83.1 (2015): 335-352.

18th November: Lecture 11: Reference Dependence 1: Evidence for Reference Dependent Preferences

We start by examining some of the classic experimental results which demonstrate the need for models of reference dependence

- *Key reading (s):*
 - o 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.
 - o Camerer, Colin F. "Prospect theory in the wild: Evidence from the field." Colin F. Camerer, George Loewenstein, and Matthew. Rabin, eds., *Advances in Behavioral Economics* (2004): 148-161.
- *Class presentation (to be prepared for the following week)*
 - o Zeiler, Kathryn, and Charles R. Plott. "The willingness to pay/willingness to accept gap, the endowment effect, subject misconceptions and experimental procedures for eliciting valuations." *American Economic Review* (2004).
- *Background Reading*

- o Ert, Eyal, and Ido Erev. "On the descriptive value of loss aversion in decisions under risk: Six clarifications." *Judgment and Decision Making* 8.3 (2013): 214-235.
- o Harbaugh, William T., Kate Krause, and Lise Vesterlund. "The Fourfold Pattern of Risk Attitudes in Choice and Pricing Tasks*." *The Economic Journal* 120.545 (2010): 595-611.
- o Rees-Jones, Alex. "Loss aversion motivates tax sheltering: Evidence from US tax returns." Available at SSRN 2330980 (2014).
- o Von Gaudecker, Hans-Martin, Arthur Van Soest, and Erik Wengström. "Heterogeneity in risky choice behavior in a broad population." *The American Economic Review* (2011): 664-694.
- o Camerer, Colin, et al. "Labor supply of New York City cabdrivers: One day at a time." *The Quarterly Journal of Economics* (1997): 407-441.
- o Crawford, Vincent P., and Juanjuan Meng. "New york city cab drivers' labor supply revisited: Reference-dependent preferences with rationalexpectations targets for hours and income." *The American Economic Review* 101.5 (2011): 1912-1932.
- o Madrian, Brigitte C., and Dennis F. Shea. The power of suggestion: Inertia in 401 (k) participation and savings behavior. No. w7682. National bureau of economic research, 2000.

25th November: Lecture 13: Reference Dependence 3: Models of Prospect Theory and Loss Aversion

Covering classic models of reference dependent behavior.

- *Key reading (s):*
 - o Kőszegi, Botond, and Matthew Rabin. "A model of reference-dependent preferences." *The Quarterly Journal of Economics* (2006): 1133-1165.
 - o Kahneman, Daniel, and Amos Tversky. "Prospect theory: An analysis of decision under risk." *Econometrica: Journal of the Econometric Society* (1979): 263-291.
- *Class presentation (to be prepared for the following week)*
 - o Masatlioglu, Yusufcan, and Efe A. Ok. "Rational choice with status quo bias." *Journal of Economic Theory* 121.1 (2005): 1-29.
- *Background Reading*
 - o Tversky, Amos, and Daniel Kahneman. "Advances in prospect theory: Cumulative representation of uncertainty." *Journal of Risk and uncertainty* 5.4 (1992): 297-323.
 - o Tversky, Amos, and Daniel Kahneman. "Loss aversion in riskless choice: A reference-dependent model." *The quarterly journal of economics* (1991): 1039-1061.
 - o Abeler, Johannes, et al. "Reference points and effort provision." *The American Economic Review* (2011): 470-492.
 - o Masatlioglu, Yusufcan, and Collin Raymond. "Stochastic Reference Points, Loss Aversion and Choice under Risk." (2013).

- Masatlioglu, Yusufcan, and Efe A. Ok. "A canonical model of choice with initial endowments." *The Review of Economic Studies* (2013): rdt037.
- Kőszegi, Botond, and Matthew Rabin. "Reference-dependent risk attitudes." *The American Economic Review* (2007): 1047-1073.
- Kamenica, Emir. "Contextual inference in markets: On the informational content of product lines." *The American Economic Review* 98.5 (2008): 2127-2149.

2nd December: Lecture 13: Reference Dependence 3: Reference dependence and Limited Attention.

Exploring the ways in which limited attention can bring about reference dependent behavior

- *Key reading (s):*
 - Woodford, Michael. "Inattentive valuation and reference-dependent choice." Unpublished Manuscript, Columbia University (2012).
- *Class presentation (to be prepared for the following week)*
 - None
- *Background Reading*
 - Dean, Mark, Ozgur Kibris, and Yusufcan Masatlioglu. "Limited Attention and Status Quo Bias." Available at SSRN 2519242 (2014).

9th December: Lecture 14: Reference Dependence 4: Reference dependence in the Brain.

- *Key reading (s):*
 - Caplin, Andrew, et al. "Measuring beliefs and rewards: a neuroeconomic approach." *The quarterly journal of economics* 125.3 (2010): 923.
 - Schultz, Wolfram, Peter Dayan, and P. Read Montague. "A neural substrate of prediction and reward." *Science* 275.5306 (1997): 1593-1599.
- *Class presentation (to be prepared for the following week)*
 - None
- *Background Reading*
 - Caplin, Andrew, and Mark Dean. "Dopamine, reward prediction error, and economics." *The Quarterly Journal of Economics* (2008): 663-701.
 - Schultz, Wolfram, and Anthony Dickinson. "Neuronal coding of prediction errors." *Annual review of neuroscience* 23.1 (2000): 473-500.
 - Glimcher, Paul W. "Understanding dopamine and reinforcement learning: the dopamine reward prediction error hypothesis." *Proceedings of the National Academy of Sciences* 108.Supplement 3 (2011): 15647-15654.
 - Tom, Sabrina M., et al. "The neural basis of loss aversion in decision-making under risk." *Science* 315.5811 (2007): 515-518.
 - De Martino, Benedetto, Colin F. Camerer, and Ralph Adolphs. "Amygdala damage eliminates monetary loss aversion." *Proceedings of the National Academy of Sciences* 107.8 (2010): 3788-3792.