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Introduction

The neoclassical framework in economics provides a coherent and internally consistent body of theory that offers rigorous, parsimonious, and falsifiable models of human behavior. Augmented with auxiliary assumptions, it is flexible enough to analyze a wide range of phenomena and its qualitative predictions often accord with one's gut feeling about many phenomena. In actual practice, the neoclassical framework includes, but is not restricted exclusively to, consistent preferences, subjective expected utility, Bayes' rule to update probabilities, self-regarding preferences, emotionless deliberation, exponential discounting, unlimited cognitive abilities, unlimited attention, unlimited willpower, and frame and context independence of preferences. Neoclassical economics is also typically underpinned by optimization based solution methods and an equilibrium approach.

Neoclassical economics is a logically consistent and parsimonious framework that is based on a relatively small set of core assumptions, and it offers clear, testable, predictions. However, extensive empirical evidence that has accumulated over the last few decades reveals human behavior that is difficult to reconcile within the typical neoclassical models.

There has been a parallel growth in rigorous theoretical models that explain better the emerging stylized facts on human behavior. These models have borrowed insights from psychology, sociology, anthropology, neuroscience, and evolutionary biology. Yet, these models maintain a distinct economic identity in terms of their approach, rigor, and parsimony. Collectively, these models form the subject matter of *behavioral economics*, which is possibly the fastest growing and most promising area in economics.

Any falsifiable theory that replaces/modifies any of the core features of neoclassical economics, by alternatives that have a better empirical foundation in human behavior is a potential member of the class of behavioral economic theories, if it can pass stringent empirical tests.

Consider the following quote from Gintis (2009, p. xvi) that nicely captures the problem that we face in the current teaching of economics and, indeed, in the approach to economics: "Economic theory has been particularly compromised by its neglect of the facts concerning human behavior... I happened to be reading a popular introductory graduate text on quantum mechanics, as well as a leading graduate text in microeconomics. The physics

text began with the anomaly of blackbody radiation,....The text continued, page after page, with new anomalies...and new, partially successful models explaining the anomalies. In about 1925, this culminated with Heisenberg's wave mechanics and Schrödinger's equation, which fully unified the field. By contrast, the microeconomics text, despite its beauty, did not contain a single fact in the whole thousand-page volume. Rather the authors built economic theory in axiomatic fashion, making assumptions on the basis of their intuitive plausibility, their incorporation of the "stylized facts" of everyday life, or their appeal to the principles of rational thought....We will see that empirical evidence challenges some of the core assumptions in classical game theory and neoclassical economics."

In behavioral economics, and in this brief course, we are interested in models that explain well the evidence from the lab and the field. In particular, we subscribe to the view that economic models must pass stringent empirical tests. The job of economic theory is to offer an ever improving sequence of models that can explain everything that the refuted models could explain and in addition some new phenomena that the older models could not. I do not subscribe to the view that economic models should not be subject to stringent tests, or that they exist solely to form some intuition about a phenomena, or tell a fable or a story, or worse, that they are to be pursed for reasons of aesthetic beauty alone.

The subject matter of behavioral economics is vast in scope. Indeed, it is even more ambitious in scope as compared to the study of neoclassical economics. One can conceivably teach an entire MSc on the subject, twice over. So you would appreciate that a seven lecture course will just very barely, scratch the tip of the iceberg. My hope is that I can get you sufficiently excited about the subject so that you can continue to follow developments in this exciting area, which I firmly believe to be the future of economics.

I shall strive to give you lecture notes that are based on my forthcoming book:

- Sanjit Dhami (2016). Foundations of behavioral economic analysis. Oxford University Press.

Some background reading

A great collection of articles on judgement and decision making can be found here:

- Kahneman, D., and Tversky, A. (2000). Choices, Values and Frames. Cambridge: Cambridge University Press.
- Gilovich, T., Griffin, D., & Kahneman, D. (2002). Heuristics and biases: The psychology of intuitive judgment. New York: Cambridge University Press.

Some of the early papers are covered here:

- Camerer, C., Loewenstein, G., and Matthew, R. (eds.). (2003). Advances in Behavioral Economics, Russell Sage Foundation and Princeton University Press

Here are two useful surveys of behavioral economics:

- Rabin, M. (1998) Psychology and Economics. Journal of Economic Literature. March issue.

- DellaVigna, Stefano, (2009) Psychology and Economics: Evidence from the Field. Journal of Economic Literature. June issue.

For an excellent treatment of the experimental literature in behavioral game theory, see:

- Camerer, C.F. (2003). Behavioral Game Theory: Experiments in Strategic Interaction. Princeton: Princeton University Press.

For a really nice set of applications of behavioral economics to development economics, see:

- World Bank (2015). Mind society and behavior. The World Bank Development Report.

Two entertaining, thoughtful, non-technical, and must-read accounts of behavioral economics can be found here:

- Kahneman, D. (2012). Thinking Fast and Slow. London: Penguin Group.
- Thaler, R.H. (2015) Misbehaving: The making of behavioral economics. W. W. Norton and Company: New York.

The tentative plan of the lectures (subject to the time constraints and the speed with which you would like me to move) is as follows. The reading list contains more readings than you could possibly hope to go through in this course, but it gives you some of the foundational papers that you could chase later, depending on your interests. As we go along, I will briefly indicate the importance of many of these papers.

Days 1 and 2: Behavioral Decision Theory and Applications

Topics covered include expected utility theory and its refutations, probability weighting functions, rank dependent utility, and prospect theory. Applications covered include; Exchange asymmetries, myopic loss aversion, tax evasion, equity premium puzzle, goals as reference points, contracts as reference points, and prospect theory preferences in capuchin monkeys.

Readings

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- Benartzi, S., and Thaler, R.H. (1995). Myopic loss-aversion and the equity premium puzzle. Quarterly Journal of Economics. 110(1): 73-92.

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• Tversky, A., and Thaler, R.H. (1990). Anomalies: preference reversals. Journal of Economic Perspectives. 4(2): 201-211.

• Tversky, A., and Kahneman, D. (1992). Advances in prospect theory: cumulative representation of uncertainty. Journal of Risk and Uncertainty. 5(4): 297-323.

Days 3 and 4: Other-regarding preferences

We first consider the evidence from a range of experimental games. These include the ultimatum game, the dictator game, the trust game, the gift exchange game, and the public goods games with and without punishment. We focus on two main theoretical models, the Fehr-Schmidt model of inequity aversion and the ERC model. The main application of these models that we consider is to the design of optimal incentive schemes in principal-agent relations. The role of intentions can be modelled by using psychological game theory that I will briefly outline later. Time permitting, I might be able to cover some evidence on human virtues, and on the surprising effects of incentives.

Readings

• Abeler. J., Becker, A., and Falk, A. (2014). Truth-telling: a representative assessment. Journal of Public Economics. 113: 96-104.

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- Ellingsen, T., and Johannesson, M. (2008). Pride and prejudice: the human side of incentive theory. American Economic Review. 98(3): 990-1008.
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Day 5: Behavioral time discounting

We discuss here the exponential discounting model and the empirical evidence for the model. We shall focus on one main violation of the model, i.e. violation of stationarity, or the common difference effect. We consider one possible explanation that arises via hyperbolic discounting. Our focus will be on quasi-hyperbolic discounting and its applications to life cycle choices and to issues of procrastination.

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Day 6: Behavioral game theory

Behavioral game theory is a vast field; it probably requires at least a one semester course, at a minimum, to come to grips with the material. Given that I just have one two hour lecture, I must be very selective in my choice of topics and paint in broad brush strokes. I shall assume that you have taken at least one course in game theory at some stage. I shall speak about some of the evidence on Nash equilibrium and its refinements. I then briefly speak about level-k models, the winner's curse, and psychological game theory.

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Day 7: Judgement heuristics and biases

In our final lecture, we explore the most radical idea in behavioral economics: the heuristics and biases approach. This Nobel Prize winning work by Daniel Kahneman and Amos Tversky and others, establishes that economic agents do not behave in a manner that would make their behavior consistent with neoclassical theory even on “as if” grounds. I shall cover several judgement heuristics. Many biases arise from the tendency to believe that small samples possess the statistical properties of large samples. This gives rise to the law of small numbers, which is the basis of the representativeness heuristic, the gambler's fallacy, and the

hot hands fallacy. Other heuristics do not necessarily invoke the law of small numbers. The conjunction fallacy arises from inadequate attention to the set inclusion relation; the availability heuristic arises from drawing inferences based on readily available information; the affect heuristic arises from attention to the emotional dimension of a decision; the anchoring heuristic arises from tying one's inferences to anchors that are often irrelevant to the problem; base rate underweighting arises from giving inadequate attention to the base rate in Bayes' rule; conservatism arising from underweighting the likelihood of a sample; hindsight-bias arises from discrepancies between predictive and postdictive guesses; confirmation-bias arises from selective attention to events that is biased towards confirming one's initially held position; false consensus arises when people overestimate the extent to which others share their beliefs. Biases also arise from ignoring statistical phenomena such as regression to the mean and the distinction between necessary and sufficient conditions.

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