

Economics 2035, HBS 4155
Fall 2019

Matthew Rabin
HBS and Economics Department
Harvard University

Psychology and Economic Theory

Tomorrow's Assumptions, Today

Fridays 1:30-4:15, 230 Cumnock Hall (on the HBS campus)
Actual beginning time (to allow river crossing): be seated and ready at 1:40 sharp

Instructor: Matthew Rabin

Offices: 435 Baker Library, 310 Littauer Center, e-mail: matthewrabin@fas.harvard.edu

Teaching Fellow: John Macke

Office: G26 Littauer Center, e-mail: jmacke@g.harvard.edu

WHAT IS THIS COURSE, AND CAN/SHOULD YOU TAKE IT?

This course explores ways that psychological research indicating systematic departures from classical economic assumptions can be translated into formal models that can be incorporated into economics. Topics include ways utility theory can be improved—such as incorporating reference dependence, news utility, social preferences, self image, and other belief-based tastes—and ways we can relax assumptions of perfect rationality—such as incorporating focusing effects, limited attention, biased prediction of future tastes, present-biased preferences, biases in probabilistic judgment, and errors in social inference. The course will emphasize (a) careful interpretation and production of new evidence on relevant departures, (b) formalizing this evidence into models that can, with discipline and rigor, generate sharp predictions using traditional economic approaches, and (c) exploring economic implications of those models presented. Although we will primarily emphasize (b), the course is meant to be useful to students whose interests lie anywhere in this spectrum, under the premise that all such research will be improved by a greater appreciation of the full spectrum. The course is intended for PhD students in the Business Economics and Economics programs and others who have a solid background in microeconomic theory at the level of introductory PhD courses in these programs. (Microeconomic courses in other programs on campus, and even many non-Harvard Economics PhD courses, are generally *not* likely to be adequate substitutes.) While obviously appropriate to those wishing to specialize in “behavioral economics”, the course is also designed for those interested in doing research in particular fields of economics. And while the course centers on theoretical models (learning and evaluation will center around solving formal problem sets), the theory is focused on empirical implementability and economic relevance, so that the course is also designed for those interested in theory-influenced empirical research.

This course contains material and approaches targeted at those with an interest in doing PhD-level research in economics. **Enrollment for credit in this course is simply not suitable for those unprepared in or uninterested in PhD-level economics *no matter* the intensity of interest in psychology or behavioral economics. *Really.*** If—after you have read the syllabus, and preferably after attending the first lecture—you have any questions about whether this course is appropriate for you, please come talk to me.

The topics covered in this course are listed later in the syllabus. Generally I will assign readings covering some of the evidence suggesting that new assumptions would improve economic analysis, discuss this evidence very briefly in class, and then use this evidence to develop new formal models. When available, I will assign papers that contain the formal models. To keep the workload manageable (sort of), the number of assigned readings will be minimal. This will be way too little to give a full sense of either the relevant evidence, or the applications; students are encouraged to read further.

Anybody is permitted to attend the lectures and I am delighted if people can benefit, but permission to enroll in the course for credit is strictly limited. Admission for credit will be automatic for regular (non-visiting) Harvard students in any department who have passed Economics 2010a and 2010b with a grade of B+ or better. (Those who have taken 2020a and 2020b may also qualify, but should perhaps talk to me.) Harvard undergraduates with *advanced* training in microeconomic theory and who have an interest in Economics graduate studies are also encouraged to consider taking the course. MIT Economics Department PhD students may take the course for credit. Brown University Economics PhD students should consult with a faculty member in their department, and then contact me for permission with relevant information (and the name and email of the faculty member they have consulted with). With apologies, all other visiting students and students enrolled at other universities (besides MIT and Brown) cannot take the course for credit, for either grades or pass-fail, nor as an official auditor whose attendance or participation must be certified to somebody. And, with more apologies, to make ourselves as useful as possible and as available as possible to the enrolled students, and to continue to make the lectures available to all who are interested in attending, we set some tight rules: Those who are not enrolled cannot turn in assignments for unofficial evaluation, nor can we make office hours available. My lectures are often highly interactive, and I don't like to exclude anybody from participating. I do ask for understanding that we want to keep the orientation of the class as described below, so that we hope that such participation is based on reading the required material and an interest in the goals of the course.

DETAILED COURSE NON-DESCRIPTION

Because it is designed as an introduction to modeling psychological phenomena that are not yet totally integrated into mainstream economic analysis, the material in this course is not entirely like what you've seen in most of your other economics courses. But it is *not* an alternative to mainstream economics. It is only about improving the psychological realism of formal economics, so as to use classical economic approaches to improve our answers to classical economic questions. Like all other courses, this course does not cover all topics that might be of interest. So, this course is ...

not about the philosophy or methodology of economics: Maybe too little time is spent on methodology in graduate school. And some methodological quandaries inhere in the topics of this course, and I have strong views that you won't be able to miss. But beyond the class, I will not spend time exploring methodological issues. Doing so takes time away from the substance. And usually when economists debate "Methodology" in the context of challenging existing assumptions, the debate ends up focusing on an abstract official line about appropriate methodology, rather than a realistic assessment of how workaday economic research is actually done. The maintained hypothesis of the course is that it is sensible for some economists to spend some of their time doing standard economic research that happens to incorporate some until-recently-untraditional-as-a-focus-within-economics elements of human nature that seem to be both true and economically relevant.

not about non-psychological models of bounded rationality: We won't consider models of bounded rationality (based on computer science, artificial intelligence, etc.) that are meant to capture cognitive limits of economic actors, but not based on evidence that humans think this way. In some arenas I think it makes tremendous sense to focus on these alternative models of bounded rationality, and more generally this can be a very useful research agenda. But that's not what this course is about. We will consider those models based on research inspired by the empirical evidence of what humans are like.

not about savanna economics: Many people are interested in how the human species evolved to be the way we are, and most economists are prone to think of evolutionary arguments when being exposed to unfamiliar assumptions. Whatever the merits or demerits of an evolutionary perspective on social science, it is not what this course is about. Under the maintained hypothesis that in the (very long) "short run" we can treat the biological aspects of human nature as fixed, we won't consider the biological dynamics of evolutionary change. We will try to figure out some facts about what humans are like, and see how that matters for the economy. Any empirical insights into how people are—from whatever source, including by researchers who find a focus on evolutionary pressures to be enlightening—is of course welcome. And presumably some researchers believe that the focus on evolutionary pressures will eventually yield high payoff in understanding humans as they currently are, at which point evolution-inspired insights into human nature about economically relevant behavior can be incorporated into a course like this. But this course will not emphasize why being the way we are was adaptive for our ancestors on the savanna.

not about experimental economics as such: Readings will include experimental papers, and as such we will when appropriate examine the nature of the experimental evidence. But the course won't be about experimental methods per se. I am not qualified to give detailed guidance on such methods, and in any event this course is meant to use the results from experiments to motivate new economic assumptions, and to emphasize the potential for non-experimental research in these topics. We also won't study experiments testing economic institutions in the laboratory, except insofar as they are either motivated by or informative about the underlying psychology of economic actors.

And:

totally not an alternative to mainstream economics.

In the most important senses, the course won't at all be a departure from mainstream economics. I am a devotee of mainstream economic methods: methodological individualism; formal, careful, mathematical articulation of assumptions; logical analysis of what conclusions follow from those assumptions; and thoughtful empirical testing of both the assumptions and the conclusions. This isn't the only way to approach social science, and it is true that obsessions with methodological individualism and mathematics can sometimes damage research. It is a good thing that these methods and standards are not imposed on all social-science research. Indeed, much of the evidence for the formal models we will be developing doesn't meet economists' narrow criteria for good research—and it should humble us that so much useful insight is derived from modes of research we do not employ. But it is my belief that the best way for economists to do economics in general, and the best way for us to use this material in particular, is with careful formal theory and statistical analysis. In these regards, the course will be purposely, pointedly, persistently, proudly, and ponderously mainstream.

COURSE REQUIREMENTS

(Please note – the requirements below are indeed requirements, and indicate that the appropriate preparation is needed. But for those with the background and time, the strictness of these requirements should not be much of a constraint on the primary emphasis of the course: to learn material that will be valuable for your research and general understanding of economics.)

There will be three problem sets. Problems will range in difficulty from moderately easy to quite hard. These problems aren't meant to be simple, and don't panic if you struggle with them. But the problem sets will be graded for correctness, so please do seek help answering any problems you are struggling with *before* handing them in.

You are encouraged to work together on the problem sets. It is a great way to learn, especially on challenging problems. But while collaboration is allowed, directly copying someone else's work is not, and will be considered a violation of the university's code of ethics. Do not read others' answers from past or present problem sets—you should write up solutions after any joint work that reflect your own understanding. Please state who you worked with, and the extent of collaboration at the top of the relevant assignments.

Please email John your problem set as a pdf by the due date, or arrange hand delivery before that. Late problem sets will be *heavily* penalized, and you should provide explanation for delay.

There are limits to the amount of time we can spend grading the problem sets. Answers requiring too much ocular, linguistic, or (avoidable) cognitive effort won't be read. Please make an effort to write/type legibly and present your results clearly and succinctly. Problems will frequently require substantial math; you are welcome to hand in all the work you did to reach an answer, rather than putting in effort redacting it, but *please* make sure to provide guidance through your steps of reasoning, or to flag work that is superfluous to the reader. Cross out anything not meant to be part of your answer. Clearly indicate your answer by labeling (if typed) or circling (if handwritten).

Planned schedule of problem sets:

Problem sets will be posted on Canvas in the following (subject-to-change) installments:

Problem Set H: Parts of it will be posted on canvas by (Mondays) September 9, September 23, and September 30, due Friday, October 11 by 1.40 pm, returned Friday, October 18.

Problem Set 2: Posted on canvas by (Mondays) October 7, October 14, and October 28, due Monday, November 4 by 5.00 pm, returned Friday, November 8, 4.15 pm.

Problem Set O: Posted on canvas (Mondays) November 4, November 11, November 18, and November 25, due Wednesday, December 5 by 5.00 pm.

Exam: To be determined, to fit people's schedule as best as possible, during the week of November 11. (There will be no final exam; material not covered in the exam will be on Problem Set O.) We will poll all to find a time that works for everybody, and aim to accommodate any good-faith efforts by enrolled students. We'll choose a time slot by the end of September, hopefully sooner. **No non-emergency reasons for missing the exam will be accepted after the time is announced.**

The course grade will be determined by 20% of your worst score on H, 2, and O, 30% on the exam, and 25% on each of your non-worst-score problem sets. (These "scores" might involve some mean-and-standard-deviation adjustments before being averaged.)

HANDOUTS, LECTURE NOTES, OFFICE HOURS, AND WHAT NOT

I intend to post both lecture notes and handouts (including problem sets, but not answer keys) on <https://canvas.harvard.edu/courses/67880>

In class and elsewhere, please address me by my first name. Don't call me Professor Rabin. (If you insist on addressing me formally, please address me as "The Legendary Patsy Cline.")

John and I will both hold office hours; we will announce the times and procedures in class, and post this information on the canvas site. Both of us aim for considerable access, and we will design and adjust logistics to make that happen.

RESEARCH

You should now be beginning the shift away from learning the results of other peoples' research into conducting your own research. A major reason for teaching this material is to positively influence your research. Yet: This course won't focus on research. So: I encourage you to think about research on your own, with each other, and with faculty, including me. It is easy to shortchange this goal under the pressure of taking courses and other obligations, so it requires some focus on your part to attend to it. I encourage you to talk to me about ideas for research applying the material from this (or any) course. While I welcome discussions on any of your ideas, including experimental research and modeling-new-psychology theory, I most strongly encourage ideas for "field-empirical" research and implications-of-these-assumptions theory. I especially encourage ideas that do not merely test the validity of some of the principles and models discussed in the course, but are of direct general interest to economics. I enjoy talking to students about their ideas for empirical research.

If you wish to talk about research, 2035-targeted office hours that we will announce are often fine for this, but also please also feel free to sign up for any of my sign-up office (at four different locations, varying in geography and sweat). More generally, if for some reason you need to talk to me about something for which office hours attended by others aren't appropriate, you should feel free to sign up. Also, for those in the Business Economics and Economics Ph.D. programs, I and other faculty are always available to discuss *any* issues regarding the program.

If you are in the second year of your PhD program, you should be attending at least one or two seminars regularly. This is central for you to start your transformation into a research-focused life. I encourage you to attend the "Behavioral" seminar, Wednesdays 12.00 – 1.15 in Littauer 301 and the theory/behavioral lunch, Fridays 12.00 – 1.15, in Littauer M15. But you should also attend at least one other seminar in some specific area of economics. Also note the optional sessions added to the lecture schedule below, which I am happy to hold if there is sufficient interest.

Tentative Schedule of Lectures

We meet on Fridays between September 6 and November 22. The following schedule of topics is tentative; required and optional readings on these topics will be provided throughout the term.

Lecture 1: September 6

- Perspectives and conceptual framework
- Introduction to belief-based utility
- Anticipatory utility and ego utility

Lecture 2: September 13

- Introduction to reference dependence and prospect theory

Lecture 3: September 20

- Reference-dependence: expectations as the reference point
- Reference-dependent risk attitudes
- Reference dependence and news utility

Lecture 4: September 27

- News utility continued
- Other risk preferences

Lecture 5: October 4

- General principles of belief-based utility
- Self image and social image
- Choice-set-based and “causative” preferences

Optional Session #1, October 5 or 6: If there is interest, we can do an extra meeting on social preferences. (Fairness, Altruism, Spite, Reciprocity, etc.)

Lecture 6: October 11

- Introduction to limited rationality
- Focusing and bracketing effects
- Context effects and choice-set-dependent distortions

Lecture 7: October 18

- Introduction to mispredicting preferences
- Projection bias: evidence and model
- Projection bias: applications

Lecture 8: October 25

Misprediction of future utility vs. present bias
Introduction to biases in judgment and quasi-Bayesian models

Lecture 9: November 1

Sampling biases

Lecture 10: November 8

More cognitive biases
Problems and challenges in non-Bayesian models
Motivated Reasoning

Scheduled Exam, TBD, week of November 11-15

Lecture 11: November 15

Introduction to Social Inference and Non-Inference

Optional Session #2, November 16 or 17: If there is interest, we can do an extra meeting on applying the material in the course to any field of economics of interest, both discussing some general ideas and giving feedback on specific student interest.

Lecture 12: November 22

Models of social learning
Ideas and approaches to research

Optional Session #3, December 5 or 6: If there is interest, we can do an (experimental) “improv” session—you bring ideas for some preference or error that seems intuitive or important to you (or, ideally, you’ve seen evidence), and Matthew will lead brainstorming on how to model it formally.

Optional Session #4, December 7 or 8: If there is interest among students who understand the intellectual enterprise enough to handle the inherent difficulty of struggling to choose good approaches and good topics, Matthew will expand on random pet peeves and fine tune some of his screeds in the course, and fill in any bad attitude that he missed during the term, about what kinds of research programs and approaches might be misguided or misleading.