Psychology and Economic Theory

Tomorrow's Assumptions, Today

Instructor: Matthew Rabin
E-mail: matthewrabin@fas.harvard.edu

Teaching Fellow: Davide Taglialatela
E-mail: taglialatela@g.harvard.edu

Mondays, 300 Chan Hall (HBS Campus)

Canvas Site: https://canvas.harvard.edu/courses/123706

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 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 reading through this syllabus** you have any questions about whether this course is appropriate for you, please sign up to talk to me. I will have 30-minute office hours throughout the semester linked from my home page, and always have such slots available to Harvard students to discuss anything, especially research, and we will announce more general course office hours in coordination with those registered for the course as we begin the term. From August 28 to September 15 I will also try to have sign-ups for shorter meetings if people want to talk about taking the course. Please remember to send a follow up email per sign-up instructions.

I would suggest filling out the information sheets provided on canvas and send them to me before meeting. (You must fill these out to attend the course or take it for credit in any event.)

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 talk to me first.) First-year PhD students, as well as Harvard or MIT 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 will be allowed to take the course for sure; MIT PhD students in other programs should consult with me about doing so. 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 I can contact about preparedness). 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 participation must be certified. (Students at Harvard and MIT who wish to work through the material without registering will be allowed to do so, but should also talk to me.) Those who are not enrolled cannot turn in problem sets for unofficial evaluation, nor attend office hours designed for help on problem sets or formal material.

Because of the structure of the course, even following along without registration may not be easy without a serious engagement with the material, and for both those registered and those not, the notes will not be suited for printing out. This barrier is intentional, for pedagogical purposes of both each individual participant (I believe thinking through the concepts and the math as you go through it is generally the best way to learn this type of material) and for their fellow students (to assure that when we meet all participants are prepared and engaged).

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 AND STRUCTURE

There will be four problem sets---Spring, Summer, Winter, and Fall. 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.

While most problems can be done working together and with our help during office hours, on each problem set we will also include one problem that we ask you to work on entirely alone—*not* working together nor will Davide and I help you in office hours. This is meant to induce hard independent thinking. The emphasis will remain on learning the material, not evaluation, so (1) these will not be weighted heavily in comparison to the "collaborative" problems, and (2) we're not going to go out of our way to avoid organic discussions simply to obstruct progress on these problems.

The course grade will be determined by your problem sets, with 30% weight on each of your best two problem sets, and 20% each on your worst two. (These "scores" might involve some mean-and-standard-deviation adjustments before being averaged.) Please submit your problem set on canvas by the due date on the 2035 canvas site.

There are limits to the amount of time we can spend grading the problem sets, so please make an effort to present your results clearly and succinctly. Problems will frequently require substantial math; you are welcome to hand in all the work you did, and we don't want you to put in effort

redacting your work, but *please* make sure to provide guidance through your steps of reasoning, flag work that is superfluous to the grader, and clearly indicate your eventual answers.

The problem sets (but not answer keys) will be posted on canvas. While each "season" will have an announced set due date, we sometimes post the problems that comprise them incrementally as the relevant material gets covered. Experience suggests attempting to announce the timing in the syllabus undergoes enough revisions that I won't do so here.

We will also post lecture notes, as well as reading lists (with required(ish) readings, but also a broader sampling that you might find of interest; please ask me about additional readings on topics not included in case I can suggest something https://canvas.harvard.edu/courses/123706). Our plan is to post interactive lecture notes on all the required (and some optional) material on canvas. These notes will generally encourage you to work through material as you go along (individually or as self-organized small groups. (We even have some parts of the notes where you will be more than encouraged—you will be required to provide answer questions, sometimes even correctly, before moving on. This will all vary by topic and date of preparation.)

Davide and I will both hold abundant 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—the lack of specifics here is to let us design and adjust logistics to make that happen, based on class size, people's schedules, etc. In the meantime, I always have sign-up hours with various live and virtual locations posted.

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.")

RESEARCH

Most who are taking this course should be in transit from a life of coursework towards a life of research. A major reason for teaching this material is to positively influence your research. While it is of course intended for those interested in psychology and economic theory, it is likely (and it is my wish) that most taking the course plan research or policy careers in other areas. Indeed, the material in this course and the focus of my own research is towards models that can be used as input into other areas of economics. This is a course in theory, but it is meant as applicable theory that is engaged with the rest of economics.

And 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.

In addition to coursework related meetings, if you wish to talk about research, please also feel free to sign up for a slot. 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.

Tentative Schedule of Lectures

We meet on Mondays between September 11 and December 4. The following schedule of topics is tentative; required and optional readings on these topics will be provided throughout the term.

Lecture 1: September 11

    Perspectives and conceptual framework
    Implications-oriented psychology and economics
    Time, (experienced) utility, and choice
    Introduction to belief-based utility

Lecture 2: September 18

    Introduction to reference dependence and prospect theory
    Reference-dependence: expectations as the reference point
    Reference-dependent risk attitudes
    Reference dependence and news utility

Lecture 3: September 25

    News utility continued
    General principles of belief-based utility

Lecture 4: October 2

    Self image and social image
    Choice-set-based and "causative" preferences
    Other risk preference
Non-Lecture: October 9 (No lectures due to Canadian Thanksgiving)

Lecture 5: October 16

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

Lecture 6: October 23

    Present-biased preferences
    The three brands of "time inconsistency"

Lecture 7: October 30

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

Lecture 8: November 6

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

Lecture 9: November 13

Sampling biases and other cognitive biases

Lecture 10: November 20

Problems and challenges in non-Bayesian models
Motivated reasoning
Limited attention

Lecture 11: November 27

Introduction to Social Inference and Non-Inference

Lecture 12: December 4

Models of social learning
Ideas and approaches to research

Possible optional meetings: In addition to these lectures, depending on demand, I am happy to hold additional optional meetings on topics of interest. This can include a meeting on "social preferences" (fairness, altruism, spite, reciprocity, etc.) early in the course, which I will distribute some notes on but not present in lectures. Other possible topics to consider: 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 (and this can also be useful to me get thoughts on applicability to particular fields that students are concentrating on. Something I've never actually done, but intrigues me, is to 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 I can lead some brainstorming on how to model it formally. Another possible optional session could include is if there is any particular screed or bad attitude that I started in class but ran out of time (or even I considered too tangential), or I can share some of my pet peeves I forgot to screed about in class entirely. Or you can bring your own critiques (which are encouraged during regular class meetings, but that likewise needed to be limited), pet peeves, screeds, or simply questions about how we approached the material or how one might use some of this to inspire research. I am also especially interested in questions you might have about missing topics.