Economics 219A
Fall 2006

Matthew Rabin
Economics Department
University of California—Berkeley

Foundations of Psychology and Economics

Meets: Wednesdays 12:00-3:00, 639 Evans
or, more precisely:
12:14 *sharp* to 2:58, with about 17-minute break shortly before 2:00

Your Host: Matthew Rabin
Office: 503 Evans Hall
Phone: 643-8622
E-mail: rabin@econ.berkeley.edu

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

This course explores ways to formally model the findings of psychological, experimental-economic, and other research demonstrating departures from perfect rationality, self interest, and other classical assumptions of economics. While the point of studying this material is to improve positive and normative economics, this course will focus a little on the behavioral evidence itself and mostly on formal assumptions reflecting this evidence in a way that can be used by economists; it will not focus on the economic applications. Economics 219B, taught in the spring, builds from and complements this course, and places greater emphasis on both economic applications and on field empirical methods.

This course is intended for PhD students in the Economics Department and or other departments on campus who already have a solid background in microeconomic theory. This means that you have taken Economics 201A-B or their equivalents. Economics 201A-B is a year-long required Economics PhD sequence in microeconomics, including choice under uncertainty, incentive theory, and game theory. **This course is simply not suitable for those unprepared or uninterested in graduate-level economic theory, no matter the intensity of interest in psychology or behavioral economics. *Really.***

Admission will be automatic for regular Berkeley PhD or undergraduate students in any department who have passed 201B with a grade of B or better, and is otherwise by my consent. Students from the regular Bonn and Mannheim German exchange program are almost always fully prepared, as well, and because of this and the official status of the exchange program are welcome and encouraged to take the course. Because of space, class-size, and resource limitations, the course is not open for credit (grades or pass-fail) to any other visiting students.

DETAILED COURSE DESCRIPTION

MORE ON WHETHER TO TAKE THE COURSE OR NOT

This course focuses on formal modeling. Students will be required on problem sets and exams to solve math problems of the form familiar from 201A-B, at a slightly more demanding level. The course will involve more words and less formality than the typical advanced theory field course. It will, of course, involve far more reading and discussion of the behavioral evidence and psychological foundations of our assumptions than do other theory courses—or any other economics courses. But, in the end, its emphasis is on formal modeling.

Economics 219A can be used as either part of a Psychology and Economics field or part of an Advanced Theory field. For the P&E field, it can in principle be combined with any one of Economics 219B (economic applications), 219D (experimental economics), or 219C (topics), but only 219B is being offered this year. For theory, it is most often used with Economics 206 or 209A, though it can also be combined in principle with 207A, 207B, 209B, or 296. While it will to some extent be oriented to those wishing to go into research in theory, it is probably even more useful for those who seek to apply behaviorally-inspired models for use in empirical work. It is also appropriate for those who wish merely to familiarize themselves with this material. I anticipate that many of those taking the class will not be planning to specialize in either theory or P&E, and I am enthusiastic about that fact.

Physical space permitting – with it may not – auditors with appropriate background are welcome. I like to run a very interactive classroom. But because we have a lot of material to cover, and by experience with this material, I would ask that *only* those who have read the relevant readings participate in class discussions. This is both because I am going to mostly assume participants have done the readings, and because I don't want long discussions of the appropriate psychological assumptions that are not grounded in the assigned readings that motivate and provide evidence for those assumptions.

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, the number of assigned readings will be minimal, and too little to give a full sense of the relevant evidence; students are encouraged to read further.

If after you have read the syllabus you have any questions about whether this course is appropriate for you, please come talk to me.

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 like what you've seen in most of your other courses. But it is *not* an alternative to mainstream economics. It is only about improving the psychological realism of formal economic assumptions, 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. But beyond a brief discussion at the beginning, we will not spend time exploring methodological issues. Doing so takes time away from the substance. And I feel that 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 untraditional-within-economics elements of human nature that seem to be both true and economically relevant. (We also won't spend time philosophically fretting about the nature of the terms "rationality" or "self interest", etc.; we'll try rather to be clear about the positive or normative content of claims of all particular assumptions.)

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 (e.g., "unforeseen contingencies") 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 focused more narrowly on 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 most prone to think evolutionary arguments when considering alternatives to familiar 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 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 can provide suggestions and references for how to get into experimental stuff if you are interested, and we are lucky to have qualified faculty now on campus to help (such as Shachar Kariv, John Morgan, Teck Ho, and Barb Mellers). But I am not qualified to give detailed guidance, 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.

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

PROBLEM SETS

There will be four substantive problem sets. Each will involve primarily formal problems. Problems will range in difficulty from moderately easy to quite hard. You are encouraged to work together on the basic problems, and very encouraged to come see me for help before they are due. But you are *not* allowed to read others' answers from past or present problem sets, and should only hand in answers that reflect your own understanding. 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.

Please write legibly and clearly, crossing out anything not meant to be part of your answer, and clearly indicating your final answer. Answers requiring too much ocular, linguistic, or (avoidable) cognitive effort won't be read. This doesn't mean that you need perfect penmanship and cunning concision; just that you make a minimal effort to write/type legibly and present your results clearly and succinctly. Problems will frequently require substantial math; you are welcome and encouraged to hand in all the work you did to reach an answer, but *please* make some effort to provide guidance through your steps of reasoning. (Annotating and organizing mathematical arguments is also a good skill to develop for presenting models and results in research papers.)

Planned (but typically somewhat altered) schedule of problem sets:

Plain-Bellied Sneech:	Handed out August 30; due September 20, 12:08 p.m. Answer key distributed October 4
Star-Bellied Sneech:	Handed out September 20; due October 11, 12:08 p.m. Answer key distributed October 18.
North-Going Zax:	Handed out October 25; due November 8, 12:08 p.m. Answer key distributed November 15.
South-Going Zax:	Handed out November 2; due November 29, 12:08 p.m. Answer key distributed November 29.
Yertle the Turtle:	Handed out November 22; Due the day Johnny Depp and I get married, 12:08 p.m. Answer key distributed November 29.

EXAMS

There will two in-class three-hour exams. They are tentatively scheduled for:

Midterm:	In Class, October 18
Final Exam:	In Class, December 6

The exams will be closed book. They will be based on readings, lectures, and problem sets. They will be designed to be very passable for those doing the reading, seriously engaging the problem sets, and attending lectures. The final will be heavily weighted to the post-midterm material. The exams will mostly reflect the problems from the problem sets. They will also contain not-very-picky questions about the psychological evidence designed to check on whether you've read and understood the reading. I will distribute sample past exams.

GRADING

The course grade will be a weighted sum of the score you get on each of the 4 problem sets that will be graded before the term ends, and on the two exams. The problem sets will each count 12.5% of your final grade, the midterm 31.25%, and the final 31.25%, totaling 112.5%. The extra 12.5% will be removed from whichever of the 6 scores is your worst. Except for emergencyish excuses, late problem sets will be heavily penalized (at least 25% per day) and you will not be allowed to make up missed exams.

RESEARCH

You should now be shifting 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 duties you have, so it requires some focus on your part to make sure to attend to it. I strongly 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 theoretical or experimental research, I most strongly encourage ideas for "field-empirical" research, and especially 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 are in the second year of the Economics PhD program, you should be attending at least one or two seminars regularly. This is invaluable for you to start your transformation into a research-focused life. I encourage you to attend the Psych and Econ seminar, Economics 218, Tuesdays 2-3:30 in 608-7 Evans. But I would also very strongly encourage you to attend at least one other seminar in some specific area of economics.

HANDOUTS

I am an anachronism in so many ways. One is my unwebbedness: handouts, lecture notes, etc. will not be posted on the web (nor sent by e-mail). Students will be responsible for knowing what handouts have been distributed and getting these handouts. The primary source of such information should be attending class, of course (and showing up on time when you do so). But you should also contact a fellow student when you miss a lecture (and have him or her collect handouts for you if you know in advance you will miss it). In addition, I will post outside my office after each lecture a list of the handouts so far, and have leftover handouts in an envelope for 1 or 2 weeks after the lecture.

COMMUNICATING WITH ME

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

Subject to announced changes, I plan to have open office hours at the following times:

> September 1 to December 1
> Tuesdays 4:30 to 5:30 pm
> Fridays, 2:45 to 3:45
> *No office hours September 22, 26, and 29th or October 20th.*

You share these office hours with general drop-ins and (the 2nd half of the semester) with 201A students, but you get top priority. And the 2nd half of the semester I will in addition have the following office hours:

> October 19 to December 7
> Thursdays 2:15 to 3:15

For these office hours, 201A students will get top priority.

There is no GSI for this course, so I am your GSI. Please use my office hours, including and especially for help on the problem sets. It would be remarkable if you didn't need some assistance with the material, and I am here to help. Also, one of the benefits of open office hours is to accommodate many students at once; if fellow 219A students are in my office, please join in (I'll say so if for some reason I need to talk privately to a current visitor), and feel very free to show up in groups.

In addition to drop-in office hours, I always have sign-up office hours for advising and other purposes. The sign-up sheets are outside my office. Please **do not** sign up for these slots for course-related help as a general rule. If my scheduled office hours are always infeasible for you, let me know, and in that case do not hesitate to make appointments with me. But I ask that you schedule your studying so that you are prepared to ask questions during office hours, and do not attempt to schedule extra sessions merely because of poor timing in preparation.

The course is also meant to generate research ideas, which means you should talk to me about research as well. If you wish to talk about research, please freely sign up to do so. More generally, if for some reason you need to talk to me about something for which open office hours aren't appropriate, you should feel free to sign up. Also, for those in the Economics Ph.D. program, I and other faculty are always available to discuss *any* issues regarding the program.

I have some requests regarding office hours, and on contacting me. First, my office hours end at the end. E.g., don't arrive at 5:25 on Tuesday and expect a full session. Please arrive early if you have lengthy questions, or if you don't want to risk not having time due to others' questions. Also, you are very free to ask me *some* stuff by e-mail, especially to schedule things (e-mail better than phone messages) or if you think there is a typo or something on a problem set or handout. But please be aware that e-mail sucks for answering many types of questions. "How do I do Question 4?" or "What's up with bounded rationality?" are short questions with long answers. Also, please be aware that I typically don't respond at all to any e-mail concerning substantive course material right before exams (though accessible for panic attacks, emergencies, etc.).

Please do come to my office hours. I also like students to come by at least once early in the semester to introduce themselves—no need to have a particular agenda. I try to always have candy (and when possible healthier snack options). I have toys as well, but you must earn my trust before I let you play with them.

Tentative Schedule of Lectures

There will be 12 three-hour lectures. The following schedule is tentative (and the actual schedule will typically lag this; the schedule represents the earliest a topic will be covered).

August 30—Lecture 1	Introduction Extending the utility function Reference-dependent preferences
September 6—Lecture 2	Reference-dependent preferences and risk attitudes Distributional social preferences
September 13—Lecture 3	Choice-set- and context-dependent preferences Belief-based preferences and personal equilibrium Anticipatory utility
September 20—Lecture 4	Reference-dependence redux: expectations as the reference point Self-image and ego utility.
September 27	**NO LECTURE – MATTHEW AWAY**
October 4—Lecture 5	Social preferences redux: Self image and reciprocity Rational preferences, utility, and happiness Hedonics and the measurement of happiness
October 11—Lecture 6	Focusing and Bracketing Effects Attention, Framing Effects, and Mental Accounting
October 18—Lecture 7	Misprediction of future utility: Principles and evidence
October 25	**NO LECTURE – EXAM**
November 1—Lecture 8	Misprediction of future utility: Modeling and applications Introduction and principles of present-biased preferences
November 8—Lecture 9	Procrastination and more procrastination Applications of present-biased preferences, part 1
November 15—Lecture 10	Applications of present-biased preferences, part 2
November 22—Lecture 11	Introduction to heuristics and biases in judgment Quasi-Bayesian models
November 29—Lecture 12	Representativeness-based biases Mechanism Design and the P-word.
December 6	**NO LECTURE – EXAM**

Readings

Required Reading

The required text is Kahneman, Daniel and Tversky, Amos (editors), *Choices, Values, and Frames*, Cambridge University Press, New York, NY, US, 2000. (Referred to as CVF below.) It should be stocked at ASUC bookstore (and may be popular enough to be available elsewhere). The book is a collection of "recent classics" in psychological economics, and a few specially commissioned new writings. *Many* of the required readings in the course are from this book, serving by far as the main source for the psychological foundations (as opposed to formal modeling) topics in the course—both because I have made some effort to choose those chapters for your ease, and (more) because it happens to contain many of the awesomest writings in psychology&economics. I urge you to buy it and read it even if you are just auditing.

Below is a list of the anticipated required reading, in approximate order they will be covered. Any revisions will be announced in class. Even auditors should do as many of the required readings from CVF as possible. (And I highly recommend virtually every chapter in the book, including chapters that I am not assigning.) Ideally I will have separate more-detailed handouts of optional readings for specific topics.

0. Syllabus
1. CVF Chapter 15.
2. Rabin, M. "Psychology and Economics" *Journal of Economic Literature, March 1998.*
3. CVF Chapter 8
4. CVF Chapter 2
5. CVF Chapter 11
6. CVF Chapter 18
7. Charness, G. and Rabin, M. (2002), "Understanding Social Preferences with Simple Tests," *Quarterly Journal of Economics*, August,
8. Sobel, Joel, "Interdependent Preferences and Reciprocity," *Journal of Economic Literature Vol. XLIII (June 2005), pp. 392–436*
9. Caplin A, Leahy J, "Psychological Expected Utility Theory and Anticipatory Feelings," *Quarterly Journal of Economics* 116 (1): 55-79, February 2001
10. Koszegi B, "Emotional Agency," *Quarterly Journal of Economics* 121 (1): 121-155 February 2006
11. Koszegi and Rabin (QJE, forthcoming), "A Model of Reference-Dependent Preferences" (Botond's web page).
12. Koszegi and Rabin, "Reference-Dependent Risk Attitudes," mimeo. (Botond's web page)
13. CVF Chapter 37
14. CVF Chapter 12
15. CVF Chapter 14
16. CVF Chapter 17
17. CVF Chapter 20
18. CVF Chapter 42
19. CVF Chapter 38

20. Loewenstein, G., O'Donoghue, T. and Rabin, M. (QJE, 2003) "Projection Bias in Predicting Future Preferences"
21. Frederick, S., Loewenstein, G. and O'Donoghue, T. (2002), "Time discounting and time preference: A critical review," *Journal of Economic Literature* 40 (2): 351-401, June
22. O'Donoghue, Ted and Matthew Rabin. "Doing it now or later." *American Economic Review*, 89(1), 103–124, March 1999.
23. O'Donoghue, T. and M. Rabin (2001). "Choice and Procrastination," *Quarterly Journal of Economics*, 116, 121-160
24. Angeletos, G.-M., D. Laibson, A. Repetto, J. Tobacman, and S. Weinberg (2002). "The Hyperbolic Consumption Model: Calibration, Simulation, and Empirical Evaluation," *Journal of Economic Perspectives* 15 (3): 47-68, Summer.
25. Kahneman, Daniel and Amos Tversky. "Introduction." In *Judgment Under Uncertainty: Heuristics and Biases*, Ch. 1, pp. 3–22.
26. Griffin, D. and A. Tversky (1992). "The Weighing of Evidence and the Determinants of Confidence," C*ognitive Psychology*, 24, 411-435.

Suggestions for Other Reading

Beyond CVF and other specific articles I suggest, I'd also recommend those interested to do some more general psychological reading. For psychological background, just try picking up an undergraduate text in psychology. Three journals you might most want to look at are *Journal of Personality and Social Psychology*, *Cognition*, and *Journal of Behavioral Decision-Making*. You may also want to look at stuff written over the years by economists paying attention to psychology. The best source is Richard Thaler; a couple of his books are listed below, and you can always look at his anomalies columns in the Journal of Economic Perspective. Spanning psychology and economics, virtually any of the papers written by Danny Kahneman, Amos Tversky, George Akerlof, George Loewenstein, or Colin Camerer is worth reading.

Here are some of the books most worth looking at:

Kahneman, Daniel and Amos Tversky. CHOICES, VALUES AND FRAMES, New York: Russell Sage Foundation; Cambridge, U.K.; New York: Cambridge University Press, 2000. Awesome collection. Required for the course.

Thaler, Richard H. *The Winner's Curse: Paradoxes and Anomalies of Economic Life*, Princeton University Press, 1994. Collection of Thaler's *Anomalies* columns from *Journal of Economic Perspectives*. See also his Anomalies columns in the *JEP* since this book was published.

Baron, Jonathan, *Thinking and Deciding*, Cambridge, UK; New York: Cambridge University Press, 1994. A very nice, but basic (non-economists') introduction to how people think and decide.

Nisbett, R. and Ross, S. *Human inference: strategies and shortcomings of social judgment*, Prentice-Hall, 1980. Probably the best textbook introducing the heuristics-and-biases program in social judgment.

Cialdini, R. *Influence, the psychology of persuasion,* 1993, Quill. A classic in psychology. Somebody stole my copy of it.

Gilbert, D., Fiske, S. and Lindzey, G. editors, *Handbook of Social Psychology*, 4th ed., McGraw Hill, 1998. Excellent overview of the state of the art in social psychology.

Thaler, Richard. QUASI RATIONAL ECONOMICS, New York: Russell Sage Foundation, 1991.

Elster, Jon and George Loewenstein. *Choice Over Time*, New York: Russell Sage Foundation, 1992. An excellent collection of writings on intertemporal choice from a variety of perspectives, based on a conference.

Loewenstein, George, Read, Daniel, and Baumeister, Roy (eds.), *Time and Decision: Economic and Psychological Perspectives on Intertemporal Choice*, Russell Sage Foundation, 2003. Another excellent collection in the vein of the Elster and Loewenstein volume listed just above.

Kahneman, Daniel, Paul Slovic, and Amos Tversky, eds., *Judgment under Uncertainty: Heuristics and Biases,* Cambridge University Press, 1982. Arguably the seminal book on behavioral economics. Contains many excellent papers (including virtually all of Kahneman and Tversky's seminal articles on heuristics and biases.)

Kahneman, T. Gilovich, & D. Griffin (eds.), *Intuitive Judgment: Heuristics and Biases*, Cambridge: Cambridge University Press, 2002. An update of Kahneman, Slovic, and Tversky 1982. Looks excellent.

Thaler, Richard (ed.), *Advances in Behavioral Finance*, New York: Russell Sage Foundation, 1993. Excellent collection of behavioral finance papers (if you like that sort of thing).

Shleifer, Andrei. *Clarendon Lectures*, Oxford; New York: Oxford University Press, 2000. Based on a series of lectures, very nice sort of introduction to behavioral finance.

Kagel, John. and Alvin Roth (eds.), *Handbook of Experimental Economics*, Princeton, N.J.: Princeton University Press, c1995. Good overview of findings from experimental economics, in several long chapters.

Camerer, Colin, *Behavioral Game Theory: Experiments in Strategic Interaction*, Russell Sage Foundation and Princeton University Press, 2003. This very recent book is the Bible of laboratory studies of how people play games, from the man who invented and leads the field. Both brilliant and encyclopedic.

Kahneman, D., Diener, E., and Schwarz, N. (eds), *Well-Being: The Foundations of Hedonic Psychology*, Russell Sage Foundation, 1999. A collection of articles of variable topic and quality, but containing some important chapters. I think it is a revolutionary text.

Camerer, Colin, Loewenstein, George, and Rabin, Matthew (eds.), *Advances in Behavioral Economics*, Russell Sage Foundation and Princeton University Press, 2003. A collection of mostly reprinted articles, with an emphasis on more recent research.