

The Psychology and Economics of Beliefs:

Wednesdays 9:45am-11:45pm, Zoom

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Considering taking the course?

Registration is by consent of the instructor. (There is no lottery!) Students interested in taking the course should email Professor Rabin a resume/cv if you have one, the information sheet posted on his web page and on this canvas page, and an (unofficial) transcript of your courses and grades at Harvard. Please **after reading the syllabus thoroughly** email these to matthewrabin@fas.harvard.edu (and cc Phoebe Cai at pcai@g.harvard.edu), and provide any additional information that we might consider. You should also email Professor Rabin (again, **after reading the syllabus**) if you have any additional questions. If you prefer, and especially if the questions are involved, before classes begin Professor Rabin will have 15-minute meetings you can sign up for at <https://my.timetrade.com/book/3R5SG>.

(After the term begins, Professor Rabin will have abundant 30-minute slots you can sign up for as individuals or group at <https://my.timetrade.com/book/WF1VH>)

WHAT IS THIS COURSE?

This seminar focuses on how individuals and groups come to form beliefs about important things in their lives. What careers are lucrative and rewarding? What medicines are effective? What lifestyles are healthy? What investment strategies make sense? What is your nation’s income and wealth distribution? What would a 10% decrease in taxes do to the unemployment rate? What will be the average global temperature in 2030, and how would that depend on the number of countries that adhere to the Kyoto Accords? How many days do you predict you will go on vacation next year? How many children will you have by 2030? What are the average grades among all students in this course likely to be—and what will your grade be? What percentage of UK soldiers who participated in the 2003 war in Iraq who were dead by 2008 died in Iraq or died in the UK? (On the 2018 syllabus this list of questions included “What is the probability of a

pandemic disease that doubles the death rate in the U.S. in 2019 compared to 2017?”) How many times do you expect to check your email tomorrow? How many times do you believe you did it yesterday? Etc. What would you have believed if you were alive in 1970 (what does that question even mean?) and were watching a story about a police officer shooting and killing a Black man after pulling the man over for speeding—and the police officer claimed it was in self-defense but a companion in the car of the Black man claimed his friend had his hands up submitted to arrest. How would that depend on the race of the companion, and of the police officer? If you lived in Hong Kong in 1996 and had the option to move to Britain, what would you believe would be the odds that there would be free elections for local government in 2006? How would that depend on whether you watched the massacre at Tiananmen Square on June 4-5, 1989 on television, or merely read about it in the newspaper. And, centrally, how do all these beliefs compare to correct beliefs—those that are empirically valid, or at least that would be fully rational given the information you have? You’ve had three children, all boys, what are the odds that the next child will be a girl? If you were flipping a coin and it came up tails three times in a row, what are the odds that the next flip will be heads?

We will review theories and evidence about how individuals develop their beliefs from personal observations and experience, and how people learn from each other. We will also study difficulties in defining beliefs and in measuring beliefs, and the existence (or not) of data in different domains for what people actually believe. The organizing theme will be to compare the assumption of full rationality that is traditional in economic theory to evidence identified by psychologists about the types of errors people make. We will also explore what consequences these errors have for important economic, medical, social, and political choices. In each of these domains, when do people become overconfident in their beliefs? Or instead not learn as much as they should? Are people's beliefs internally consistent? When do groups of people all come to the same conclusions, vs. “polarize” into very different beliefs.

The course will be intentionally eclectic in terms of the nature of the material, and in assignments that will count towards your grade. Students will be required to do some readings and to carefully look over some lecture notes that present some of the psychological evidence on how people form beliefs, and an emphasis on some of the ways we formally model errors in belief formation. (In all cases, learning how we model the errors will necessarily involve learning the correct statistical analysis that fully rational agents would apply.) Assignments will include mathematical problem sets requiring you to solve for both what the rational conclusions are for processing information and what conclusions our models of errors predict people will reach. The course will also involve reading and research on people’s particular beliefs in different domains, and some oral and written analysis of such research. You will also be asked to formulate (but not necessarily execute) a design for an incentivized survey to collect and interpret people’s beliefs in some domain. Most oddly, some of the course will involve you—to the degree you are comfortable and consistent with desire for privacy—analyzing and understanding how you go about forming beliefs relevant to your own economic, medical, and social choices. We will discuss some of the mechanisms being studied for improving beliefs. Required readings will include academic research in psychology, economic theory, and empirical economics, as well as some studies of what current beliefs are and some historical beliefs were.

CAN YOU TAKE THE COURSE, AND IS IT FOR YOU?

The course is available solely to undergraduates at Harvard. It is not open to registration for masters or PhD students. Because it is a seminar course that emphasizes comfortable participation and discussion in a small group, sharing the appropriate background, it is not open for auditors.

Because of the heavy emphasis on rigorous formal theories and measurements along the lines of mainstream economics, the seminar requires background in microeconomics, mathematics, and statistics/econometrics. Students should be prepared in these subjects at roughly the exposure to material expected of an economics or applied math major in the middle of junior year. Although exceptionally qualified students at earlier stages or with different backgrounds are encouraged to consider the course, it is simply not suitable for somebody who has not been exposed to math, statistics, and economics. (An understanding of Bayes Law and basic probabilities and statistics is a must, as is some exposure to mathematical microeconomics.) Completion of courses at the level of Math 21A and Stats 110 are strongly advised, and Math 1A, Economics 1010A or 1011A, and some probability or statistics course are required.

The perspective of the seminar is influenced by the background of both the professor and teaching fellow in economic theory, empirical economics, as well as psychology and (what is popularly known as) behavioral economics. Professor Rabin has been doing research related to the topics of this seminar for quite a long time. A primary goal of the seminar is to draw out connections between some of the more recent economic theory that attempts to incorporate more realistic psychology, and actual beliefs in the world. As such, we'll be exploring how to take these new theories and the psychological evidence that motivates them "to the field," to figure out if and when and how these theories matter, and we'll cover relatively new methods in identifying people's beliefs.

REQUIREMENTS AND GRADING

Although previously we have spelled out an exact schedule for the course in the syllabus, we will not do so this time. Although it was hard to plan it finely even in The Before Times, it will be much harder this time because of various uncertainties (class size, logistics of Zoom, pandemics, attempted coups, etc.) Specifics (and surveys to prompt discussion) for the first meeting will be given by the end of Friday, January 22, and in advance of meetings for the first few weeks; and a full timetable by middle of February.

Please look at the 2018 syllabus on Canvas and the classes home page to get a rough sense for the structure of the course. Also, that syllabus has extended list of readings on topics that we will cover this semester. But we will add and integrate topics that are especially topical; while the course would not usually be fine-tuned to the latest events, even for those who have lived much longer lives than you have, the inter-related horrors of recent times are a shock, and could do with some scrutiny.

The requirements are:

- Full (and punctual) attendance.
- Two mathematical problem sets during the first half of the semester
- Participation in each meeting of the class. The quality of your participation (and not simply the quantity) will be part of your grade.
- Short assignments and surveys virtually every week, turned in (with a strict deadline, typically by Tuesday at 11.59 am). A few of these will be evaluated as part of your grade, most will simply be turned in to help prepare for the discussion that week.
- A semester project that involves designing your own belief-measurement study based on the principles in the course and review of some existing studies doing so.
- Two written assignments summarizing and critiquing some research.
- Analysis of your own belief-formation in some domain
- At least one meeting with Professor Rabin during the first half of the semester.
- There will **not** be an exam in the course.

Elaboration:

Attendance: Due to the nature of the course, full attendance is required. You will of course be excused for unexpected emergencies or illnesses. Requests to be excused for other reasons (including job interviews that a company cannot provide a compelling reason to insist takes place at an exact time) must be discussed ahead of time with Professor Rabin, at the beginning of the semester or immediately when you learn about them.

Problem Sets: There will be two 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 invited (and even encouraged) to work together on the problem sets, but you are not allowed to read others' answers from past or present problem sets, and should hand in solutions separately that reflect your own understanding. You should acknowledge collaborators and describe the extent of collaboration at the top of the relevant assignments. 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.

Problem sets will be due by the start of class at 9.45 am, whether or not you are punctual, on the due date. Please email Phoebe your problem set as a pdf by the announced due dates. Late problem sets will not be accepted.

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.

Semester Project

Throughout the semester, each student will work towards designing (and possibly implementing) their own study that measures beliefs. To help with this,

- A written assignment will have students read academic papers that properly measure beliefs or directly discuss the methodology of measuring beliefs, and to articulate specific examples of beliefs that can be measured by these techniques.
- Students are encouraged to talk to Phoebe or Professor Rabin about topics and proposals for measuring specific beliefs, preferably well in advance of the deadline to be announced for getting approval of the topic by Professor Rabin.
- Each student will give a presentation of their semester project

The final product will be a carefully written proposal for an experiment that is turned in before the last class. A list of potential topics and more specific instructions will be provided after class size and interests are better understood.

Written Assignments

There will be three written assignments, including the one above, prepared ahead of a group discussion on measuring beliefs. The two other assignments will also be prior to group discussion on the topic. For these roundtables, we will assign three to five academic papers covering the given topic for everyone to read. Students are expected to thoroughly read the papers and come to the roundtable prepared to discuss these papers (and other relevant ideas/literature). These written assignments will help guide students when preparing for these roundtables. More specific instructions will be provided when each assignment is distributed.

Course Grade

Of the requirements listed, the ones that will be evaluated for assigning grades are:

Problem sets, in total: 40%
Class participation: 20%
Written assignments, in total: 20%
Semester Project: 30%

Note that the above percentages sum to 110%. We will reduce the contribution of your worst category by 10 percentage points. For example, assume you scored lower on the written assignments than the other three types of assignments. In this case, written assignments would only count towards 10% of your final grade.