

Behavioral Economics

Instructor: Simon Halliday

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This syllabus is preliminary and subject to change.

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Pre-requisites for Behavioral Economics

EC0254 requires you to have completed EC0250 and one of ECO/MTH/SDS220. You need to have completed the courses for at least some of the following reasons:

- We build substantially on consumer theory and constrained maximization from EC0250. We will look at various forms of utility functions and experiments that evaluate self-interest while also examining human rationality.
- We build on choice under uncertainty from EC0250. We evaluate whether expected utility theory is the best or only description of individual choices with risk and compare it with prospect theory.
- We will employ the knowledge you obtained from ECO/MTH/SDS220 about means, standard deviation, correlation, probability distributions and regression analysis with one or more variables in order to understand results from economic experiments.
- We will employ the practical skills you developed from ECO/MTH/SDS220 in using a statistical software package like R (or Stata) to produce graphical and statistical output that is relevant to the questions we evaluate.

As calculus is a pre-requisite for EC0250, I shall assume that you are comfortable with calculus and algebra.

Game theory (with Prof Miller or while abroad) is a recommended course to have taken, but not a pre-requisite.

You need to have access to a laptop/notebook for this course. We will use them every Thursday either for experiments or data analysis in R. If you need access to one, let me know and we shall do our best to organize one with ETS.

Learning Goals

I separate learning goals into goals with different verbs: *know*, *understand*, *comprehend*, *analyze*, *synthesize*, *do*, etc.

- *Know* the virtues and limitations of the rational actor model and its application to choice theory and the behavioral sciences.
- *Understand* the role of economics as a discipline in the behavioral sciences
- *Ask* meaningful questions with important potential answers
- *Analyze* data from experiments and surveys to answer questions relevant to the behavioral sciences
- *Synthesize* different ideas, theories and empirics within the behavioral sciences
- *Design* well conceived experiments and surveys to *answer* important questions
- *Find* ways to *wrangle* data and play around with *computing* to derive useful insights
- *Recognize* the benefits of *teaching yourself* to do new things.

Course Surveys

Please make sure you complete these surveys by the end of the first week of term.

- Your individual background and preferences: goo.gl/forms/M9DaKh366j
- Questions about your thinking and preferences: goo.gl/forms/MKPML7aMny
- Moodle statistical knowledge survey: <https://moodle.smith.edu/mod/questionnaire/view.php?id=405232>

Method of Instruction

The course is a lecture- and discussion-based course with labs and a substantial amount of student participation and teamwork. Students are expected to prepare the chapter readings for each session and to be able to answer questions about the readings to produce a high quality discussion. Each student is expected to contribute to the discussion. If you do not contribute, I shall encourage you to do so. If you contribute substantially more than anyone else, then I may ask you rather to encourage the engagement of others. We will also employ peer evaluation, though the professor will award grades.

Texts

Copies of the required texts are (or will be) available in the Smith Bookstore and are (or will be) on reserve at the Library. The supplementary texts will have copies on reserve at Neilson Library (don't buy them unless you really, really want to).

Required text

- Edward Cartwright, 2011/2018, *Behavioral Economics*, 2nd Edition or 3rd Edition, Routledge Advanced Texts in Economics and Finance, Taylor and Francis.

The companion website for the book is [here](#). At the book's website you'll see quizzes, flashcards, and worked examples.

Recommended

I would strongly recommend that you buy & read this book in the first two weeks of the course.

- Michelle Baddeley, 2017, *Behavioural Economics: A Very Short Introduction (Very Short Introductions)*, Oxford University Press, Oxford, UK.

Supplementary

We use four supplementary texts in the course. They are all available free of charge online through Moodle.

1. Bowles and Halliday (forthcoming) is a text in intermediate microeconomics that you can use to revise.
 2. Plott (2007) is for understanding the basics of different experimental designs.
 3. Grolemond and Wickham (2016) is to supplement the work you do in basic data science toward replicating and producing your own statistical results.
 4. Kieran Healy (2018) teaches in-depth data visualization.
- Bowles and Halliday, *Microeconomics: Competition, Conflict and Coordination* is a forthcoming textbook in intermediate microeconomics. You can access the pdf of the draft of the book on Moodle. I will refer to it mostly to remind you of ideas you should remember from intermediate microeconomics.
 - Charles Plott, 2007, *Markets, Games and Strategic Behavior*, Pearson. Note, a draft .pdf of this book is available [various places](#) online and I will refer to the draft version most of the time.
 - Grolemond and Wickham, 2016, *R for Data Science*, available free of charge online at r4ds.had.co.nz.
 - Healy, 2018, is available in draft form online at <https://kieranhealy.org/publications/dataviz/>

If you'd like a hard copy book, then get one of these two:

- Baumer, Horton and Kaplan, 2017, *Modern Data Science with R*, Chapman and Hall. See companion site here: mdsr-book.github.io/
- Kaplan, Danny, 2015, *Data Computing: An Introduction to Wrangling and Visualization with R*, Project MOSAIC.

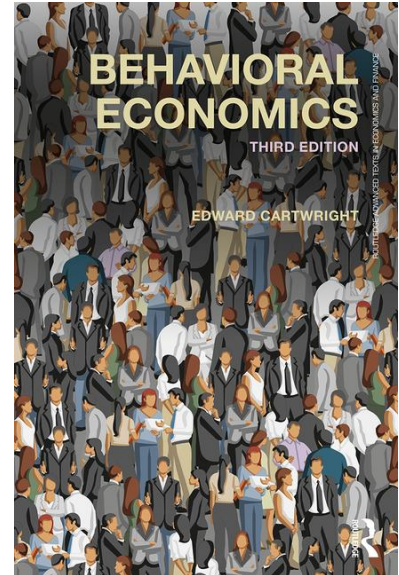


Figure 1: Our Textbook

Datacamp

We shall use DataCamp for this course for you to do exercises and learn the basics of R. We shall occasionally do exercises together during Thursday classes, or I will expect you to do Datacamp exercises or in-class exercises for homework. I abbreviate DataCamp to DC for homework.

Be sure to do the following:

1. If you do not have one, create a LinkedIn account with your Smith (or Five-college) email address (please be sure to use your .edu email address - you can add other ones later).
2. Create an account at [Datacamp.com](https://www.datacamp.com) connected to your LinkedIn account.
3. I will add you to the course on [Datacamp.com](https://www.datacamp.com) and you will be able to complete exercises that synchronize with your LinkedIn account.

Note: This is the second time I shall use DataCamp for a course I am teaching and it was really helpful last time I used it. I hope you find it helpful too.

Course Schedule

This Course Schedule is Preliminary and Subject to Change (Snow days, sudden travel, wanting more time, etc all affect what we do).

Date	Week	Topic	Reading	Lab/Experiment	Assignment
1/24	Week 1	Intro	BE Ch. 1	-	-
1/29-31	Week 2	Heuristics	BE Ch. 2	Experiment & Lab 0	DC: HW1
2/5-7	Week 3	Risk	BE Ch. 3	Lab 1	ER1
2/12-14	Week 4	Risk	BE Ch. 3	Experiment	DC: HW2
2/19-21	Week 5	Time	BE Ch. 4	Lab 2	ER2
2/26-28	Week 6	Learning & Info	BE Ch. 5	Lab 3	DC: HW3
3/5-7	Week 7	Learning & Info	BE Ch. 5 & S. 6.4	Experiment/Lab	DC: HW4
3/9-17	-	<i>Spring Break</i>	-	-	-
3/19-21	Week 8	Social Preferences	BE Ch. 7	Lab 4	ER3 (T); Prop Pres (Th)
3/26-28	Week 9	Social Preferences	BE Ch. 7	Lab 5	Prop Pres (T)
4/2-4	Week 10	Week 10	Gender	Readings	Lab 6
4/9-11	Week 11	Happiness & Utility	BE Ch. 10	Experiment/Lab	-
4/16-18	Week 12	Policy	BE Ch. 11	Lab 7: Project	ER4
4/23-25	Week 13	Policy	BE Ch. 11	Lab 8: Project	-
4/30	Week 14	Final Presentations	-	-	-
5/7-10	-	Exam Period	-	-	Project Due

Assessment

The following table summarizes the different aspects of the course's assessment.

Assessment	Percentage	Cumulative
Class Participation	10%	10%
In-class presentations	10%	20%
Take-home Midterm	25%	45%
Proposal Presentation	5%	50%
Team Project	25%	75%
Final Presentation	5%	80%
Experiment Reports	10%	90%
Lab exercises	10%	100%

- *Class Participation*: Class participation will be based on your participation in class, in your group, on Piazza, in the experiments, etc.
- *In-class presentations*: During the semester, you will give very brief presentations on topics in the chapters (in pairs or triples). You will be expected to read the original paper, give a brief written summary (to me and posted online for the class as a google doc to which you provide a link) and talk very briefly about the idea in class. There will be sign-up sheets online.
- *Proposal Presentation*: You and fellow team members will take a theory from a paper you choose and present it to the class, related to theory we cover in class. You will provide the initial thinking about the data for the experiment you would like to replicate and some ideas you're thinking of pursuing for your own design based on the replication.
- *Take-home midterm*: You will have one week to complete a take-home midterm exam. The mid-term will involve data analysis, theory from the textbook, and interpretation of experimental results from published papers.
- *Team Project*: In teams of 4-5 you will consider a question in behavioral economics that you can use an experiment to answer. You will devise an experimental design, compose instructions, and explain the statistical methods you would use to analyze the data. You will review the relevant literature and explain the theory that pertains to your question. **Be sure to meet Professor Halliday before spring break.** I shall provide a list of meet-up times on Piazza via Google Calendar.
- *Final presentation*: You and your team members will produce a powerpoint presentation and present your experimental design in class.
- *Experiment reports (ER)*: You will write experimental lab reports during the semester based on experiments you participate in during the semester. We will do 4 experiments, you will be expected to hand in the report online by the next class. They are indicated in the provisional schedule by ER1 through ER4.

- *Lab Exercises*: These are graded Complete/Incomplete. If you complete it, you get the point. If not, then not. Similarly for DataCamp where completing the exercises is what's important. If you feel like you already know the content, then let me know and we can credit it you out of specific homeworks (your backgrounds with R are quite diverse).

In-class Experiments

We will use [VEconLab](#) to run in-class experiments, typically during the Thursday class-times. I'm also investigating two alternative platforms: [MobLab](#) and [economics-games](#).

Moodle & Website

In general, I will use my site, simondhalliday.com/behavioral for content for ECO254. We also have a moodle site where I will put copies of files that we use in the course and where you will need to upload your assignments. I'll explain why I use my website as a resource.

Guideline Questions to Think About Your Team Research Project

Each member of the class will participate in a team to research a project. In doing so, you will need to think about a research experiment you would like to do (assume you had the funds and other resources to do so). It would be useful for you to write down answers to the following questions, and then iterate by revising your answers as you think about each question, discuss it with your team members, your other colleagues and the instructor. Send me your write up at any stage you wish, and feel free to come and talk to me about it.

1. What is the question you would like to have answered after the experiment? (Your answer should be a single sentence with a question mark at the end.)
2. What do you know already about the possible answers to the question you have stated above?
3. What are the various possible ways of finding an answer to the question you have stated above? Include both experimental and other methods you can think of.
4. What are the advantages and disadvantages of using an experiment to find an answer?
5. How important is this question to YOU? What are the chances that the answer you get from the experiment will surprise you or others? What are the chances that it will change someone's mind?
6. How would you conduct the experiment? (Write down a design and develop instructions.)

Think about **knowing** coming from a variety of different resources: our classes, the textbook, papers you read, your previous classes, any reading you do online and so on. All your knowledge and learning can inform what you already know.

7. Is your experimental design the *simplest possible design* to help answer the question you have stated?
8. What are the possible outcomes of the experiment? Do the possible outcomes include at least one outcome that will *answer* the question you stated above? What is the chance that you will observe this outcome?

At any stage of your thinking, feel free to go back and revise your earlier answers if you wish to.

Team Formation

I will put you into teams. I will take your answers to the course survey about your backgrounds – your majors, the courses you’ve taken, etc – to design teams with diverse backgrounds and capabilities. As this is an upper-level course, all of you should have taken the pre-reqs, but the extra courses you’ve taken will help to improve the diversity of perspectives in your teams. I would recommend that you assign each person in your team a role and either hold roles constant for the semester or occasionally rotate roles to expose people to different tasks.

Team Project Deadlines

You have a few deadlines that I have imposed on your Team Research Project.

- initial meeting with me
- team proposal presentation
- initial literature review submission
- confirm data import & initial replication exercise
- team final presentation
- final submission of project

I would suggest that you consider imposing deadlines within your team which you write up as a contract which all your team members agree to and sign. Provide me with a scan/photo of the agreement and submit parts of the project as the semester proceeds. You can amend the contract if everyone votes and agrees (send me a copy of the amendment). If you don’t vote to amend, then someone may fail to meet their contractual obligations. This happens all the time in teams, so please also be forgiving, but also let me know if this happens repeatedly and a group member does not do their agreed tasks.

Stats Prep & Spinelli Center

In the first week of ECO254, you will need to complete a knowledge survey on Moodle. Please access the knowledge survey through [Moodle](#).

Mr. Raul Zelada Aprili is the [statistics consultant](#) at the Spinelli Center. He can coach you on the use of Excel, Stata and R. If you want an appointment with him then email spinelli@smith.edu.

Revising and Learning Statistics

There are many resources online for learning or revising statistics.

- For introductory statistics, [Open Intro Statistics](#) is a free online textbook paired with R (and *mosaic*) that you can use to revise relevant statistical knowledge and applications.
- For the use of statistics in experiments, [A First Course in Design and Analysis of Experiments](#) is a textbook originally published in 2000 that has gone out of print, but the pdf of which has reverted to the author (Gary Oehlert) and which he has made available free of charge online under a creative commons license.

Excel, Stata and R

During the course we will use R to do statistical analysis and produce graphics. R is rated among the top ten most useful programming languages and is growing in use. See for example, this blogpost: www.r-bloggers.com/r-6-in-ieee-2015-top-programming-languages-rising-3-places/

We need to do statistical analysis in the course, so you will learn about tidy data, the grammar of graphics and the basics of statistical analysis building on the theoretical knowledge you should have from ECO/MTH/SDS220. If you prefer to use Stata you are welcome to, but R is becoming more commonplace and there is more support for its use at Smith. Also, R and RStudio are *free* so you can access R using RStudio on your own computer. In contrast, Stata is costly and either the college or you yourself will have to pay for R.

We will use Microsoft Excel as a spreadsheet package for this course. You should also be able to use Google Docs as an alternative. I do not recommend MacOS Numbers: it is strictly inferior to both these alternatives. MS Excel is used in a variety of business, banking and accounting settings and I strongly advise you to improve your knowledge of the software. The main use of Excel will be to prepare data for use in R by exporting the data to a csv file. So you know, the following constitutes a non-exhaustive list of the functions I expect you ought to know how to use in Excel for the workplace, but which I shan't go into myself in this course: `corr`, `cov`, `sum`, `count`, `if`, `sumif`, `countif`, `concatenate`, `stddev`, `index`, `match`, `vlookup`. (Maria will go through many of these in the Excel Workshop.)

For Help with Excel, Stata or R, I suggest you go to the following links:

- **Excel, Stata and R** Princeton's [Data and Statistical Services](#): They cover topics related to Stata and R and have very helpful annotated screenshots

to help you understand what's going on. They have a helpful comparison document for Stata and R in case you happen to know the one package better than the other.

- **R only** [The Five College Guide to R and R Studio](#): Covers the basics of what you want to be able to do in R-studio and R using the mosaic package. Prof. Horton also has a variety of very helpful videos on his webpage at Amherst for [getting started with R](#) (scroll about half-way down the page). He uses the lovely `mosaic` package to make R more accessible.
- **Stata and R** UCLA's Statistics [help pages](#): they have comprehensive help [R](#), and for [Stata](#). I use them regularly as reminders and tutorials.
- **Stata only** German Rodriguez's online [Stata tutorial](#) at Princeton.
- **Stata only** Stata.com's long list of [resources for learning Stata](#).

Important Make sure you can save an Excel file as a comma separated value (.csv) file so that you can import it easily into either Stata (using the command `insheet`) or R (using the commands `read.csv` or `read.table`). To get help in Stata you can type in `help` followed by the command's name e.g. `help insheet`. To get help in R you can type in `?` followed by the command's name, e.g. `?read.csv`.

TIP If you want to import Stata data (a .dta file) into R, you should use the `haven` package.

Style Guides

When doing statistical work, it is imperative that you adopt a good style when presenting your work. I recommend that you use a style guide.

- Hadley Wickham has a brief and useful [style guide](#).
- Google has a very comprehensive style guide for its employees who use R, [Google's R Style Guide](#)

Reproducibility and Integrity in Research

In ECO254, we shall do our best to follow the norms of the Teaching Integrity in Empirical Research ([TIER](#)) project in conjunction with the Open Science Framework ([OSF](#)).

Quantitative Literacy/Quantitative Reasoning

"Economics is an empirically oriented discipline. The focus is on explaining and testing our understanding of economic phenomena. Hence, students need an appreciation for an ability to deal with empirical matters." Siegfried et al 1991, p.216

"The foundation in empirical methods depends on (1) knowing something about the measurement of economic variables (methods of data collection,

reliability, etc.); (2) being able to organize, work with, and manipulate data for purposes of comparison; (3) the capacity to test hypotheses with empirical data; and (4) knowing how to interpret the results of various statistical procedures. The quantitative methods course should be reoriented from its almost singular statistical focus to emphasize this wider range of quantitative methods employed by economics.”(ibid. p.216)

I will do my best to help you become more quantitatively literate and to help you to become better applied social scientists in your study of behavioral economics.

Stats Tutors

Sunday through Thursday nights 7-9pm in Burton 301 there are statistics tutors who are there to help students in MTH/SDS220. But, they can also help you out with using R. You can find out more on the Spinelli Center Website: www.smith.edu/qlc/tutoring.html#S2.

Additional Links and Resources

- Rebecca Morton and Kenneth Williams. [From Nature to the Lab: The Methodology of Experimental Political Science and the Study of Causality](#). Working manuscript.

Piazza, Questions & Email

In ECO254 we will use [Piazza](#). Piazza is a website that allows participants to post questions (with their names or anonymously). Please sign up here: piazza.com/smith/spring2019/eco254.

You can respond to questions other people ask and they can respond to questions you ask. I can also endorse, comment on and add feedback to questions. I strongly encourage you to assist each other online (and preferably to do so with your names) so that I can see if and when you understand or do not understand an idea. Using Piazza also helps to ensure that I do not receive many emails asking the same question (which has happened in the past). If you email me about something already covered on Piazza, I will direct you to Piazza. I will add you all to the Piazza course after which you will receive an email alert and need to create a log-in for Piazza. Many of you probably already have such a log-in (I hope you remember your passwords).

All of which said, please feel free to email me. Typically, if an email is *not* about course content (which should almost always go on Piazza), then the email will be about something that is particularly relevant to you personally, e.g. you are traveling and will miss class, you need an extension for an assignment, you have a physical or mental health issue that needs to be resolved, etc. I shall always do my best to accommodate you. That said, I receive many, many



emails. I try to ensure I get back to you within 24 hours (during the business week) or by Monday (if you emailed over the weekend). Occasionally, I may miss an email because of reading it on my phone and forgetting to mark it as unread to respond to it later. I apologize in advance if this happens.

Some notes on our goals and our learning

- It is the third time I am teaching ECO254.
- I love the ideas in behavioral economics. I love to talk about them, think about them out loud, and to debate their relevance.
- As I will have many half-formed thoughts and draft ideas, forgive me if I get something wrong. I will do the same with you. Feel free to preface any such statement you make with “I have a half-formed thought,” or “I have a draft idea.” Encourage others who are willing to put their ideas out there and offer generous feedback.
- I am doing my best to provide a fantastic course.
- I want you to leave the course with some mastery of behavioral economics and a practical skill in the use of R.
- I am learning how best to provide such a course and how best to encourage student learning.
- I have used R erratically for about 5 years now. I think it is an excellent and powerful statistical programming language. I continue to learn how best to use it and to improve my skills as I go. It’s all about learning by doing.
- So I am learning too. Please be forgiving because I am trying to learn enough to satisfy *all* of you, whereas you need to learn enough to satisfy *one* of me.

Acknowledgments

In developing this syllabus, I have drawn on resources from variety of people: Jennifer Imazeki, John Spraggon, Shyam Sunder, Daniel Kaplan, Richard Ball, Steve Weber, Galen Panger, and others who I probably don’t realize I pilfered from. From [#econtwitter](#): [@grant_mcdermott](#), [@josh_t_dean](#), and [@humphreys_brad](#) (and to others who re-tweeted, but didn’t send specific suggestions).

Thanks to all of you.