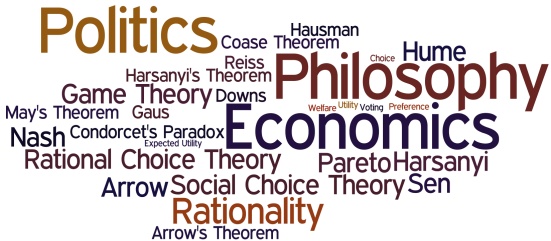
PHPE 400
Individual and Group Decision Making

Eric Pacuit
University of Maryland
pacuit.org



First Steps

1. Make sure you are signed up and can login to Piazza (available on the course website)

2. Sign up for Tophat with join code 616833. *You must purchase the pro-subscription and access Tophat through the ELMS site.*

3. Read the course policies (`https://phpe400.info/policies`) and syllabus (`https://umd.instructure.com/courses/1370492/assignments/syllabus`).

To Do

1. Answer the introductory quiz on Tophat (due Friday): https://app.tophat.com/e/616833/content/1214973
2. Complete Problem Set 1 by **Friday, September 6 at 11pm**: `https://umd.instructure.com/courses/1370492/assignments/6860648`

Grading

Participation	30%
Problem Sets	40%
Midterm	15%
Final Exam	15%

Online Tools

Course Website

`https://umd.instructure.com/courses/1370492`

Online Discussion

`https://umd.instructure.com/courses/1370492/external_tools/42711`

Participation Questions

`https://umd.instructure.com/courses/1370492/external_tools/81891`

Readings and Course Notes

`https://umd.instructure.com/courses/1370492/modules`

`https://notes.phpe400.info`

Practicalities: Math

The course is completely self-contained, but it does require that you become comfortable with some mathematical notation.

Practicalities: Math

The course is completely self-contained, but it does require that you become comfortable with some mathematical notation.

- For example, sets $X = \{a, b, c\}$, subset of $X \subseteq Y$, element of $x \in X$, cross-product $X \times Y = \{(x, y) \mid x \in X, y \in Y\}$, relations $R \subseteq X \times X$, functions $f : X \to Y, \ldots$

Practicalities: Math

- Ask questions, especially about notation that you do not understand (no matter how trivial).
- The participation questions are designed, in part, to make sure you understand the mathematical notation.
- It is important to use the proper notation on the problem sets and the exams (otherwise we won't understand your answers).
- Attend the discussion sections.

Practicalities: Math

Economic models consist of clearly stated assumptions and behavioral mechanisms. As such, they lend themselves to the language of mathematics. Flip the pages of any academic journal in economics and you will encounter a nearly endless stream of equations and Greek symbols...

Practicalities: Math

> Economic models consist of clearly stated assumptions and behavioral mechanisms. As such, they lend themselves to the language of mathematics. Flip the pages of any academic journal in economics and you will encounter a nearly endless stream of equations and Greek symbols...**The reason economists use mathematics is typically misunderstood. It has little to do with sophistication, complexity, or a claim to higher truth. Math essentially plays two roles in economics, neither of which is cause for glory: clarity and consistency.**
>
> (Rodrik, pp. 22-23)

D. Rodrik (2015). *Economic Rules: The Rights and Wrongs of the Dismal Science*. W. W. Norton.

What is this course about?

1. What does it mean for an individual or a group to make a **rational** decision?

What is this course about?

1. What does it mean for an individual or a group to make a **rational** decision?

2. Critically examining the idealizations and other assumptions behind mathematical models used in Philosophy, Political Science, and Economics.

(Useful?) Assumptions

In truth, simple models of the type that economists construct are absolutely essential to understanding the workings of society. Their simplicity, formalism, and neglect of many facets of the real world are precisely what makes them valuable. These are a feature, not a bug. What makes a model useful is that it captures an aspect of reality. What makes it indispensable, when used well, is that **it captures the most relevant aspect of reality in a given context**. (p. 11, Rodrik)

D. Rodrik (2015). *Economics Rules: The Rights and Wrongs of the Dismal Science*. W. W. Norton.

Decision Problems

Decision Problems

Decision Theory: How should individuals make decisions under uncertainty?

Decision Problems

Decision Theory: How should individuals make decisions under uncertainty?

Game Theory: How should individuals strategize in interactive situations?

Decision Problems

Decision Theory: How should individuals make decisions under uncertainty?

Game Theory: How should individuals strategize in interactive situations?

Social Choice Theory: How should a group aggregate individual opinions to reach a collective decision?

Date	Topic
8/26 8/28	Introduction, Rational preferences
9/2 9/4	**No class - Labor Day** Rational preferences
9/9 9/11	Expected utility theory
9/16 9/18	Expected utility theory
9/23 9/25	Expected utility theory Decision theory
9/30 10/2	Decision theory
10/7 10/9	Midterm Exam Introduction to game theory
10/14 10/16	Introduction to game theory

Date	Topic
10/21 10/23	Voting
10/28 10/30	Voting
11/4 11/6	Topics in social choice theory
11/11 11/13	Topics in social choice theory
11/18 11/20	Topics in social choice theory
11/25 **11/27**	Aggregating utilities **No class - Thanksgiving break**
12/2 12/4	Aggregating utilities
12/9	Review

Simple Choice Model

Menu

Simple Choice Model

Choice

Simple Choice Model

Rational Choice?

Simple Choice Model

The concept of "preference" is central to economic theory. Economists typically take preferences to be predetermined or "given" facts about individuals and, for their purposes, not in need of explanation or subject to substantive appraisal. Economic analyses begin with an individual's preferences, whatever that may be.

(p. 56, Hausman, McPherson and Satz)

Simple Choice Model

Rational Choice?

Preference

Simple Choice Model

Rational Choice

Preference

Simple Choice Model

Irrational Choice

Preference

P

P

Preferences *and* Beliefs

- **Option uncertainty**: What type of wine is it? Is the red wine sweet or dry? Is the white wine spoiled? Is the lemonade very sugary? . . .

Preferences *and* Beliefs

- **Option uncertainty**: What type of wine is it? Is the red wine sweet or dry? Is the white wine spoiled? Is the lemonade very sugary? . . .

- **Context**: What are we having to eat? What time of day is it? How many drinks have you had? Are you driving home? Are there other drink choices that are available (e.g., a beer or a soda)?. . .

Preferences

Preferring or choosing x is different that "liking" x or "having a taste for x": one can prefer x to y but *dislike* both options

Preferences are always understood as *comparative*: "preference" is more like "bigger" than "big"

Concepts of *preference*

1. *Enjoyment comparison*: I prefer red wine to white wine means that I *enjoy* red wine more than white wine.

Concepts of *preference*

1. *Enjoyment comparison*: I prefer red wine to white wine means that I *enjoy* red wine more than white wine.

2. *Favoring*: Affirmative action calls for racial/gender preferences in hiring.

Concepts of *preference*

1. *Enjoyment comparison*: I prefer red wine to white wine means that I *enjoy* red wine more than white wine.

2. *Favoring*: Affirmative action calls for racial/gender preferences in hiring.

3. *Choice ranking*: In a restaurant, when asked "do you prefer red wine or white wine", the waiter wants to know which option I choose.

Concepts of *preference*

1. *Enjoyment comparison*: I prefer red wine to white wine means that I *enjoy* red wine more than white wine.

2. *Favoring*: Affirmative action calls for racial/gender preferences in hiring.

3. *Choice ranking*: In a restaurant, when asked "do you prefer red wine or white wine", the waiter wants to know which option I choose.

4. *Comparative evaluation*: I prefer candidate A over candidate B means "I judge A to be *superior* to B". This can be *partial* (ranking with respect to some criterion) or *total* (with respect to every relevant consideration).

Concepts of *preference*

1. *Enjoyment comparison*: I prefer red wine to white wine means that I *enjoy* red wine more than white wine.

2. *Favoring*: Affirmative action calls for racial/gender preferences in hiring.

3. *Choice ranking*: In a restaurant, when asked "do you prefer red wine or white wine", the waiter wants to know which option I choose.

4. *Comparative evaluation*: I prefer candidate A over candidate B means "I judge A to be *superior* to B". This can be *partial* (ranking with respect to some criterion) or *total* (with respect to every relevant consideration).

Rational choice

A decision maker chooses rationally if her preferences are rational and there is nothing available that the decision maker prefers to what she chooses.

Rational choice

A decision maker chooses rationally if her preferences are rational and there is nothing available that the decision maker prefers to what she chooses.