# ECN 119: Psychology and Economics
# Introduction

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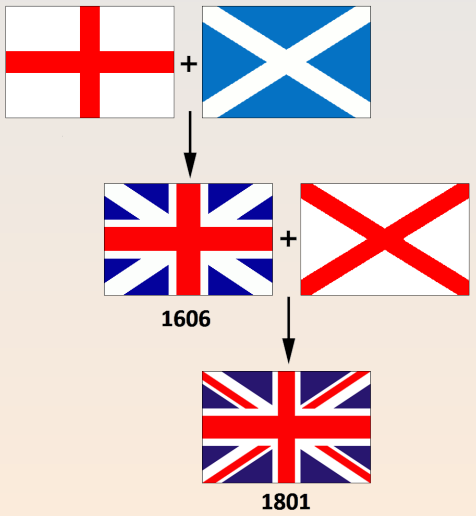
## Geography




## Geography






## Geography

## An experiment

A famous experiment in behavioral economics:

- There is a stake of $20
- Player 1 proposes a split of the $20 between the two players
  - That is: two (non-negative) amounts that add up to $20
- Player 2 must decide whether to accept or reject the split that player 1 proposed
  - If player 1's proposal was *acceptable* to player 2: the proposed split is implemented
  - If player 1's proposal was *not acceptable* to player 2: neither player gets anything

What would you do if you were player 2? What if you were player 1?



## Another experiment

Another famous experiment in behavioral economics:

- There is a stake of $20
- Player 1 proposes a split of the $20 between the two players
  - That is: two (non-negative) amounts that add up to $20
- The split is implemented
- What would you do in this case?



## Interpreting the experiments

- How do you interpret what happened in the experiments?
- Keeping the same basic structure for the scenarios, what changes to the setup do you think would have influenced what happened and why?

Potential issues in experimental methods?

- Hawthorne effect
- Self selection
- Representativeness
- Generalizability



## Decisions

Take four categories of choice problem:

1. Choice under certainty: pick your favorite thing from the stuff that's available
2. Choice under uncertainty: pick your favorite gamble from the stuff that's available
3. Choice over time: pick your favorite consumption stream from the ones that are available
4. Choice under strategic interaction: pick your favorite action given what you expect other people to do

'Standard' economic theory (think mid 20th century) has a methodology for thinking through each of those

- Simple, useful, logically coherent...
- But not always that good at describing or predicting behavior

## The standard model

A 'non-behavioral' decision maker in an economic model typically

1. makes choices as if maximizing a stable utility function,
2. discounts the future with constant impatience,
3. evaluates risk in accordance with Expected Utility Theory,
4. accurately thinks recursively in strategic situations,
5. cares only about what they get and not what happens to others,
6. and forms beliefs according to Bayes's Rule.



## Our course

We will go through these one by one in the six sections of our course:

1. Choice
2. Time
3. Risk
4. Games
5. Fairness
6. Beliefs



## Rationality

*Rationality* is the building block for microeconomics

- 'Selecting the most preferred from the available options.'
- In math: objective and constraints

$$\max U \text{ subject to } B \tag{1}$$

- Rationalizability

**An example**

You're about to leave the house. It's raining outside. Your umbrella is by the door. Do you take it or not?

- What is the *rational* choice?



## Rationality

What about decisions that have ramifications over time?

**An example**

It will rain later. To afford an umbrella, you'd have to skip lunch.

- How do you weigh the future versus the present?

## Rationality under uncertainty

Rationality extends into a world with uncertainty

$$\max EU \text{ subject to } B \tag{2}$$

$$EU(L) = \sum_{n=1}^{N} u_n p_n \tag{3}$$

**An example**

You're about to leave the house. It might rain later, or it might not. Your umbrella is by the door. Do you take it or not?



## A particular kind of uncertainty

Sometimes, the consequences of your choice also depends on the choice that I make

**An example**

You're about to leave the house. It might rain later, or it might not. If Jim drove to work today, he will give you a ride home if it's raining. Your umbrella is by the door. Do you take it or not?

What will other people do?

- Game theory is about thinking about how other people think
- And thinking about how other people think you think
- Ad nauseum...

*Mutual* rationality is the working model... but it's complicated



## Explaining choices

Here's a question for us to keep in mind:

What can explain the choices I see people make?

- What motivation could they have been working towards?
- What forces could they have been subject to?
- (Do the motivations have to be conscious?)



## The rational choice model

- The rational choice model is a model about how people behave:

**Rational choice model**

Choose the thing you most prefer from the options that are available

- The trick is that what you prefer might be completely different from me
- So rationality is not necessarily about maximizing your cash or wealth

## Rationalizing choices

- *Any* single choice can be rationalized
- A more subtle question: can a set of choices be rationalized by the same preferences?
- This question of *consistency* of choices is at the heart of much of behavioral economics
- Are inconsistencies just changing tastes?
- Or a preference for variety?
- Or...



## Explaining choices

Here's another question for us to keep in mind:

**What data would refute a given model of behavior?**

- Can I rule out things about a person when I see them make one decision? Two? Many?
- How many decisions do I need to see them make? Different decisions or similar ones?



## Three ways that economics is done

1. Theory
   - From assumptions to conclusions
   - Mathematical modeling
2. Experiments
   - Laboratory experiments
   - Field experiments
3. Empirical analysis
   - Analysis of real-world data
   - Statistical modeling
   - Historical episodes and experiences
   - Natural experiments

Throughout our course we'll see examples of how these work and how the approaches interact



## Models

## Models



## Models

One way that economists think about the world is **modeling**.

- Making models is telling stories
- A fable has a point, but don't take it too seriously
- "All models are wrong, but some are useful." (Box and Draper 1987)
- When we build models to theorize about the world, we can't chase realism
- The tradeoff we face as modelers is how much detail or realistic complications to include in our model versus how broadly applicable we want the story to be
- "If there is one hypothesis that is consistent with the available evidence, there are always an infinite number that are." - Friedman
- "All else equal..."
- Math, pictures, words: all are valid ways to do modeling!



## Models

HEALTH

### Now Is the Time to Overreact

If the measures we're taking to fight the coronavirus work, they'll look excessive later on. But the alternative is worse.

IAN BOGOST MARCH 16, 2020




## Models

## Models




## Models



## Models




## On modeling

**On Exactitude in Science**
Jorge Luis Borges, *Collected Fictions*, translated by Andrew Hurley.

...In that Empire, the Art of Cartography attained such Perfection that the map of a single Province occupied the entirety of a City, and the map of the Empire, the entirety of a Province. In time, those Unconscionable Maps no longer satisfied, and the Cartographers Guilds struck a Map of the Empire whose size was that of the Empire, and which coincided point for point with it. The following Generations, who were not so fond of the Study of Cartography as their Forebears had been, saw that that vast Map was Useless, and not without some Pitilessness was it, that they delivered it up to the Inclemencies of Sun and Winters. In the Deserts of the West, still today, there are Tattered Ruins of that Map, inhabited by Animals and Beggars; in all the Land there is no other Relic of the Disciplines of Geography.

—Suarez Miranda,*Viajes de varones prudentes*, Libro IV,Cap. XLV, Lerida, 1658

## Models

- 'Trying to realistically capture the world' is just *one* way to engage with modeling
- Not all films or books are supposed to be 'realistic'
- Not all economic models have to be 'realistic'
- 'Unrealistic' stories are valid too!
- Modeling is an art: deciding what to assume about people's preferences is one of the most important modeling decisions there is.
- We usually proceed by assuming that someone will choose *as if* they were rational and had a particular set of motivating preferences.
- In economics, we have standard ways of talking about the rational choice model using math ('utility functions') and pictures ('indifference maps') as well as words—we will briefly review all of that in topic 1



## Lost in a model

We must be careful not to lose ourselves in our models

- The "uncanny valley" (Masahiro Mori 1970) applied to economics: a model that is not the world, but close enough to be creepy?
- Do we want a model like that?
- Beware Jean Baudrillard's "desert of the real" (*Simulacra and Simulation* 1981) where the model replaces a reality from which it is untethered
- (cf. The Matrix)
- The world is not the model, and the model is not the world



## Counterfactuals in the wild

- The big picture is that as economists we constantly ask: "all else being equal, how does **this** affect **that**?"
- In film, TV, literature, and video games, it's common to tell stories in a world like our own but slightly different
  - Time travel and the butterfly effect (e.g. *The Simpsons* "Treehouse of Horror V: Time and Punishment", *Terminator*, *Primer*)
  - Alternate histories (e.g. Philip Roth's *The Plot Against America*, Susanna Clarke's *Jonathan Strange and Mr Norrell*, Philip K. Dick's *The Man in the High Castle*)
  - Sci-fi and superheroes (e.g. *Battlestar Galactica*, the *Marvel* universe, *Watchmen*)
  - Even 'realistic' stories have this feature, though!
- In economics, models are our stories and they can do similar things for us
- The question is: what kind of stories do we want to tell as we try to better understand the world?