Experimental Methods in Social Sciences (in particular Economics)

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Introduction

Overview of First Lecture

- A brief history of experiments on economically relevant questions
- The purpose of experiments in social sciences
- What is important when designing an experiment?
- Outline of the course

A Brief History of Experiments on Economically Relevant Questions

Early articles:

- Bernoulli (1738, english translation 1954, Econometrica): St. Petersburg paradox: hypothetical choice experiment (simply asked other scholars on their opinion)
- Thurstone (1931, Journal of Social Psychology): indifference curve representation of preferences (hypothetical choices, criticized by Wallis and Friedman 1942)
- Chamberlain (1948, Journal of Political Economy): market organization
- (Dresher and) Flood (1952, Rand Corporation, 1958, Management Science): prisoner's dilemma game
- Allais (1953, Econometrica): individual decision making under risk
- Sauermann and Selten (1959, Zeitschrift für die gesamte Staatswissenschaft (JITE)): oligopoly experiment

Experiments in Economics and other Social Sciences today

- In economics, experiments are now a widely accepted tool
  - today experiments on nearly every topic in economics, including macro
  - increasing methodological variety
    - laboratory
    - field
    - lab-in-the-field
    - internet (MTurk)
    - (internet) panels (GSOEP)
- Political science largely mirrors this, but has sometimes more generous standards of what is considered an experiment
  - more hypothetical decisions
  - partly rather surveys
- Differences to experimental approach in (social) psychology will be discussed in detail

The Key Motivation for Experiments in Social Science

- Exogenous variation
  - key challenge of empirical analysis is identifying causality
  - experiments allow for controlled exogenous variation, keeping all other variables of interests and confounds constant
- Replicability
  - because experiments (should) follow clearly specified plan, they are replicable, allowing to check for robustness and variations
  - field analysis typically not replicable

The Purpose of Experiments in Economics (Roth, 1995)

1. Speaking to Theorists
   - "theory-first" approach to experimental research (Plott)
   - to test the predictions of well-articulated formal theories
   - to observe unpredicted "regularities" that might lead to new theory formulations
   - examples:
     - are humans selfish, are they altruistic?
     - are humans rational, e.g, can they do backward induction or iterated elimination of dominated strategies?
     - do markets converge to equilibrium?

The Purpose of Experiments in Economics (Roth, 1995)

2. Searching for Facts
   - "data-first" approach to experimental research (Plott)
   - to study the effects of variables about which existing theory is silent
   - this might include subtle institutional differences and differences in design and implementation of experiments
   - to understand causalities rather than correlations observed in field data to develop theory
   - examples:
     - double-blindness
     - institutional details of markets
     - framing effects
     - do different subject pools lead to different results?
     - do groups decide differently than individuals?
     - does the size of financial incentives matter?

The Purpose of Experiments in Economics (Roth, 1995)

3. "Whispering in the Ears of Princes"
   - "design economics" (Roth)
   - to answer questions raised by regulatory or other state agencies about the effect of changes in the way some market, or other economic activity is organized
   - to study counterfactual designs at low costs (e.g., tests of particular auction formats or matching schemes)
   - examples:
     - testing auctions for telecom licences
     - testing matching mechanisms (students to schools, interns to hospitals, clerks to judges, etc.)
     - testing pricing and allocation of airport landing slots and space station space
     - testing the carbon pollution reduction scheme
     - testing competing regulatory schemes
4. Getting right what (some) experimental psychologists get wrong

What is a good experiment? Seven questions by Shyam Sunder

When thinking about an experiment, it is a good idea to find answers to the following seven questions

1. What is the question that 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 as well as any other methods you know.
4. What are the advantages and disadvantages of using an experiment to find an answer?

What is a good experiment? Seven questions by Shyam Sunder

5. 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 instructions.)
7. Is your experimental design the simplest possible design to help answer the question you have stated?

The rest of the course will address some issues that matter in the process of designing, running, analyzing and interpreting experiments

Outline of the Course

- We will discuss important aspects of the design and analysis of experiments
- Focus will not be on exciting results, but on proper methodology
- Topics
  - lab experiments, class-room experiments, field experiments, lab-in-the-field experiments, internet experiments, survey experiments
  - generalizability of (laboratory) experiments
  - framing effects
  - experimenter demand effects
  - differences in methodology between economists, psychologists, and political scientists
  - selection bias
  - within-subjects and between-subjects analysis
  - the role of beliefs and problems with measuring beliefs
  - differences in subject pools, e.g., gender effects and how (not) to take them into account
  - specific econometric problems of experiments and publication biases

Literature

- Roth, Alvin E. (1995) "Introduction to Experimental Economics", In Handbook of Experimental Economics, edited by John Kagel and Alvin E. Roth, Princeton University Press, 3–109.