Experimental Methods

Maximilian W. Müller and Sébastien Pouget

Toulouse School of Economics, MRes, Fall, 2023

E-mail: maximilian.mueller@briq-institute.org Web: https://www.maximilianwmueller.com/
E-mail: sebastien.pouget@tse-fr.eu Web: https://sites.google.com/site/pougetseb/

Course Description

This course offers an introduction to experimental methods used in economics. The objective is to have students work on an experimental analysis of a research question that they are interested in. This course is mainly based on the reverse pedagogy with a Do-It-Yourself spirit. After an initial discussion regarding the main principles of the experimental methodology, students are guided to produce an experimental research project, that is, to find a research idea, to design and run a pilot experiment, and to analyze and present their results. Students are free to work on a topic of interest to them, including, but not limited to, social preferences and norms, game theory, mechanism design, competitive behavior with applications to any field of economics.

Course Objectives

At the end of this class, students will understand the interest of experimental methods for research in economics. Students will know how to design an experiment. They will have experience in running an experimental pilot study. They will also present a pilot experimental analysis to the rest of the class. To achieve these objectives, the course covers the following subjects:

- Presentation of the experimental methodology: what are the objectives of an experiment? What are the pros and cons of the experimental methodology?
- Design of an experiment by students: how to formulate a research question suited for the experimental analysis? How to implement an experiment? In the lab? In the field?
- Designing for reproducibility: adopting open science practices for more robust results.
- Implementation and analysis of experiments designed by students.

Prerequisites

Basic statistics, Basic Microeconomics, Basic Macroeconomics, Basic Game Theory.

Tentative outline

- Sept. 6: Introduction: Experimental methodology and design of experiments (3 hours, Sébastien Pouget)
- Sept. 13: Noisy behavior and learning in experiments (3 hours, Sébastien Pouget) || *Overview: the process of designing an experiment. First stop: choosing a experimental research topic* || **To Prepare:** introduce 3 experimental research topics related to your (research) interests on one slide each: a) research topic, b) appeal of the experimental methodology for this topic
- Sept. 20: Types of experiments (lab, field, survey): overview and examples (3 hours, Maximilian Müller) || *Formulating research questions* || **To Prepare:** introduce 3 experimental papers related to your (research) interests on one slide each: a) research question, b) type of experiment (lab, field, survey), c) experimental design (experimental variation used, sample, sample size, etc.), and d) findings
- Sept. 27: Types of experiments: common experimental paradigms/designs (covering, among others, experiments on social, time, and risk preferences, experiments on individual decision-making vs. interactive experiments...) (3 hours, Maximilian Müller) || *Outlining an "ideal" (hypothetical) experiment* || **To Prepare:** 3 research questions and a brief motivation [max. 1 slide per each research question]
- Oct. 4: Experimental Design questions & decisions, common challenges & solutions, (ethical) rules (3 hours, Maximilian Müller) || *Designing a "realistic" experiment* || **To Prepare:** Formulate "ideal" (hypothetical) experiment for 3 research questions [max. 1-2 slides per each research question]
- Oct. 11: Preparing an experiment (experimental and/or survey design, experimental protocol, de-bugging, coding, simulations, formulating goals for a pilot) (3 hours, Maximilian Müller) || *Fleshing out a pilot study* || **To Prepare:** Formulate "realistic" experiments for 3 research questions [max. 1-2 slides per each research question]
- Oct. 18: Combining experimental and non-experimental methods (e.g., experimental + observational data; experimental methods + structural estimation) (3 hours, Maximilian Müller) || *Learning from piloting and preparing the main experiment* || **To Prepare:** develop a plan for conducting a pilot for 1 research question [max. 1 page] || **MIDTERM-ASSIGNMENT DUE** at beginning of class
- Oct. 25: Running experiments: research transparency (3 hours, Maximilian Müller) || *Analyzing experiments* || **To Prepare:** 1) prepare research transparency overview for 2 papers using experimental methods published in the last 10 years, outlining whether the following are available and how extensive/detailed they are: pre-registration, pre-analysis plan, data & code, experimental instructions, survey instruments. 2) Find 3 potential funding resources for experimental work open to doctoral students
- Nov. 1: No class (Holiday)

- Nov. 8: Running experiments: practical questions (3 hours, Maximilian Müller and Sébastien Pouget) || *Recap: the process of designing an experiment* || **To Prepare:** Write a referee report (+letter to the editor) on one of this year's job market papers that uses experimental methods
- Nov. 15: Students' presentations (3 hours, Maximilian Müller and Sébastien Pouget)

The overview for lectures has 3 parts: the anticipated content of the lecture, *a weekly focus on one specific part or step of designing an experiment in italics*, and what students should prepare in advance of this lecture (following **To Prepare**). While the lecture content is designed to familiarize students with experimental methods, by spelling out the process and steps of designing an experiment and combining this with tasks in preparation of each lecture, students will gain first practical experience in brainstorming and refining potential experiments. The prepared material has to be sent to Maximilian or Sébastien, depending on who is teaching the session, before the beginning of each class. We will discuss parts of the prepared student material each class to make the class as practical and relevant to you as possible. These weekly assignments will also help students prepare for the bigger midterm-assignment and final presentation.

Evaluations and grading scales

Students in this course will be evaluated based on their experimental research project. There will be a mid-term assignment (due by email before class on October 18th) for 30% of the total grade, a presentation grade for 60% of the total grade (the presentation will take place on November 15th), and a referee report for 10% of the total grade (due on November 8th).

The assignment grade will be attributed based on a one-page paper that explains the main aspects of the research topic (for 4 points), the interest of the question (for 4 points), the theory(ies) being tested (for 4 points), the main previous experimental results (for 4 points), and the experimental design (for 4 points). The assignment is individual.

The presentation grade will be attributed after a presentation of the research project made in class. The grade will reflect the main aspects of the research topic and the interest of the question (for 4 points), the theory(ies) being tested and the main previous experimental results (for 4 points), the adequacy of the experimental methodology and specific design for the research question at stake (4 points), the originality and the advancement of the experimental project (design, implementation, results) (4 points), and the format of the presentation (4 points). The research project and presentation may be made in groups of maximum two students.

The grade for the referee report (+letter to the editor) will be based on the following metric: quality of the summary of the paper (4 points), quality of the comments to the authors (6 points), the argumentation behind the recommendation to the editor (6 points), and the language, style, and tone of the referee report (4 points).

Course Policies

During Class

We understand that the electronic recording of notes might be important for class and so computers will be allowed in class. Please refrain from using computers for anything but activities related to the class. Phones are prohibited (unless otherwise stated) as they are rarely useful for anything in the course

Potential distance learning

If the situation permits, the course will be held in a classroom in order to facilitate the participation of students. However, if required by the situation, the course can migrate online and be held via a videoconferencing system. Students' presentations will be organized in class, if possible, or online.

Late assignments will be accepted for no penalty if a valid excuse is communicated to the instructor before the deadline. After the deadline, assignments will be accepted for a 50% deduction to the score up to 2 days after the deadline. After this any assignments handed in will be given 0.

Academic Integrity and Honesty

Students are required to comply with the university policy on academic integrity found in the Code of Student Conduct found at http://policies.ncsu.edu/policy/pol-11-35-01. Don't cheat. Don't be that guy. Yes, you. You know exactly what I'm talking about. See http://policies.ncsu.edu/policy/pol-11-35-01 for a detailed explanation of academic honesty.

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