

# PRL introduction

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# Introductions

- what class year are you?
- major?
- what are you hoping to get out of this class?

# Warm up: marijuana

Let's play a game...

- You will flip a coin...
- if heads, you will write down the number 1 if your social security number ends with an even digit, otherwise write down 0.
- if tails, you will write down the number 1 if you ever used marijuana (smoke, edible, ...), otherwise 0.

**Question:** What percentage of students have used marijuana?

## Warm up: marijuana

Law of total probability

$$\begin{aligned}P(1) &= P(1, \text{heads}) + P(1, \text{tails}) \\&= P(1 \mid \text{heads})P(\text{heads}) + P(1 \mid \text{tails})P(\text{tails})\end{aligned}$$

The bar “|” means conditional probability – like fixing a known state of the world.

When you're done, tell me whether you wrote down a 1 or 0!

# What is this class all about?

Evaluating policies (economic, governmental, otherwise) using the best available **evidence** + **techniques**.

# How are we doing this?

The **evidence** is data.

- data cleaning and organization
- data summarization

The **techniques** are statistical learning and coding.

- coding
- statistical modeling
- causal inference
- unsupervised learning

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$\underbrace{\text{evidence} + \text{techniques}}_{\text{thoughtful interpretation}} = \text{solid policy analysis!}$

# Class structure

## Foundational topics (weeks 1 through ~10)

- (1) Causality
- (2) Probability
- (3) Prediction (regression)
- (4) Unsupervised learning

## How to do research (weeks 11 through 15)

- (1) Reading academic papers
- (2) Data visualization, avoiding pitfalls
- (3) Resources at UT



# Class structure

## Before class

- readings and coding practice

## During class

- lecture and discussion

## After class

- homeworks (one per week)

# Class structure

## Evaluation

- homeworks (20%)
- in-class midterm (30%)
- research project (40%)
- engagement / participation (10%)

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## Research project

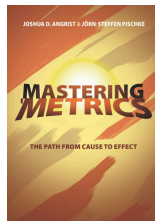
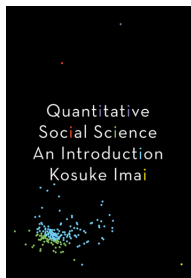
- individual
- you choose either
  - (i) replicate existing policy analysis from peer-reviewed research
  - (ii) conduct your own policy analysis, gather data and investigate

# Research project

- (i) replicate existing policy analysis from peer-reviewed research
- (ii) conduct your own policy analysis, gather data and investigate

In either case, I expect a detailed and thorough analysis and report.  
Let me know of your research topic by [October 30th](#).

# Books



- we will use the left book (QSS) for readings and exercises
- we will use the right book (MM) for supplementary reading
- additional readings will be provided as we work our way through the semester

# Expectations

- collaborate with your fellow students
- engage with the readings and in class discussions
- please make every effort to attend the coding / TA sessions!
- I will be asking a lot of you because I know you're excellent students :)
- keep up with the fast pace and have fun!