PSC 400
SYRACUSE UNIVERSITY

DATA ANALYTICS FOR POLITICAL SCIENCE

ESTIMATING CAUSAL EFFECTS WITH RANDOMIZED EXPERIMENTS

ASSIGNMENTS

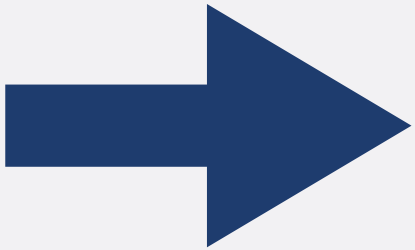
- Review Exercise 1 due next week Wednesday
- Problem Set 1 due next week Friday
- Will post both later today or tomorrow

DATASET: STAR.CSV

variable	description
classtype	class size the student attended: "small" or "regular"
reading	student's 3rd-grade reading test scores (in points)
math	student's 3rd-grade math test scores (in points)
graduated	identifies whether the student graduated from high school: 1=graduated or 0=did not graduate

WHAT WE WANT TO KNOW

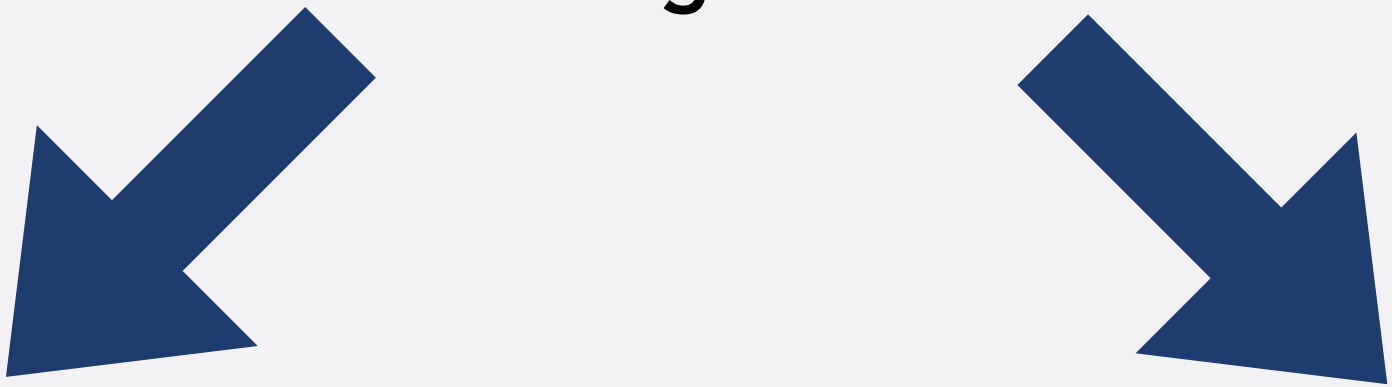
Smaller vs.
larger class size



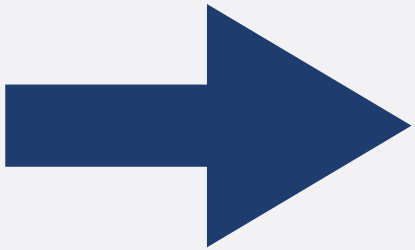
Academic
Outcomes

PROBLEM

Parents socio-economic background



Smaller vs. larger class size



Academic Outcomes

EXPERIMENT

- Randomly assign treatment
- Randomly assign students to small or regular class sizes

EXPERIMENT

- Students who are randomly assigned to be in smaller classes will be the same as students randomly assigned to larger classes on everything (except class size)
  - e.g. similar parental wealth
  - Similar gender composition
  - etc.

AVERAGE CAUSAL EFFECT

- Average score of students randomly assigned to small classes - Average score of students randomly assigned to larger classes
  - Average causal effect
  - Also known as average treatment effect (ATE)
  - Estimated using difference-in-means estimator

ANOTHER EXPERIMENT

- Is there racial discrimination in the labor market?
  - What is the causal effect of applicants' race on whether they are hired or not?

CAUSALITY

- How can we estimate the causal effect of race on hiring?
  - Want to compare Black and white applicants that are the same in terms of education, skills, experience, fit, etc.
  - Only difference: their race

ANOTHER EXPERIMENT

- Researchers sent out resumes of fictitious job candidates
  - Resumes identical, except names of applicant
  - Some names e.g. Allison, Emily, Matthew
  - Other names e.g. Tyrone, Rasheed, Lakisha
  - Outcome: Was applicant invited for interview?

RESUME.CSV

Table 2.1. Résumé Experiment Data.

Variable	*Description*
`firstname`	first name of the fictitious job applicant
`sex`	sex of applicant (`female` or `male`)
`race`	race of applicant (`black` or `white`)
`call`	whether a callback was made (`1` = yes, `0` = no)

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- What is the difference-in-means of callback rates between black and white respondents?

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- What is the difference-in-means of callback rates between *male* black and white respondents?

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- What is the difference-in-means of callback rates between *female* black and white respondents?