PSC 202

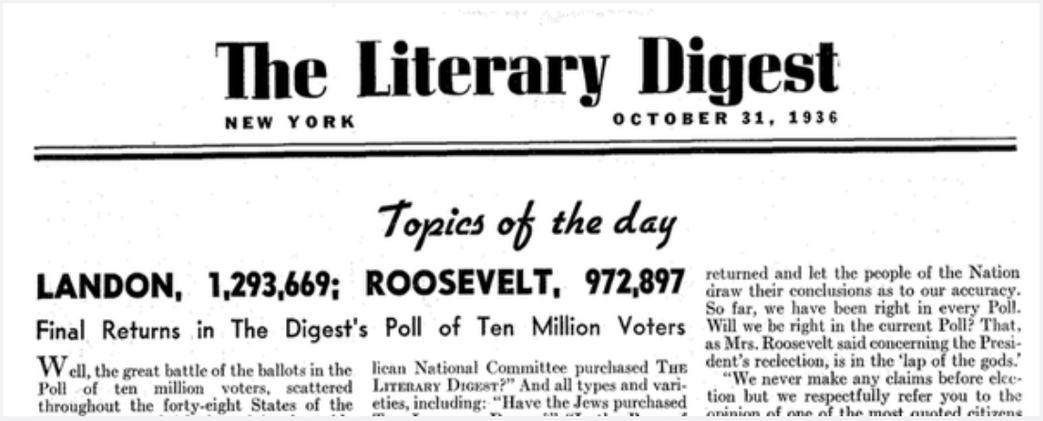
SYRACUSE UNIVERSITY

# INTRODUCTION TO POLITICAL ANALYSIS

## REVIEW

# THIS WILL NOT BE ON THE EXAM

- When conducting a study, collection of data is important
  - Do:
    - Population/census, random sample
  - Don't:
    - Send out questionnaires
    - Hope people fill them out and submit them, while not offering any incentive for people to actually do that
    - Get low response rate and self-selected sample
    - Use the results of the self-selected sample to make important decisions



The Literary Digest

NEW YORK — OCTOBER 31, 1936

*Topics of the day*

**LANDON, 1,293,669; ROOSEVELT, 972,897**

Final Returns in The Digest's Poll of Ten Million Voters

Well, the great battle of the ballots in the Poll of ten million voters, scattered throughout the forty-eight States of the

lican National Committee purchased THE LITERARY DIGEST?" And all types and varieties, including: "Have the Jews purchased

returned and let the people of the Nation draw their conclusions as to our accuracy. So far, we have been right in every Poll. Will we be right in the current Poll? That, as Mrs. Roosevelt said concerning the President's reelection, is in the 'lap of the gods.'

"We never make any claims before election but we respectfully refer you to the

# AND YET...

## Student Access in EvaluationKIT

For students, completing feedback forms in EvaluationKIT is easy to do. There are multiple access points:

- Access form(s) in the Course Feedback widget on the Blackboard main page
- Log in to **coursefeedback.syr.edu** with netID and password
- Click on the EvaluationKIT link in invitation or reminder emails to login and view available feedback forms from a phone or computer
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**EvaluationKIT Login**

# FEEDBACK TIME

SCAN ME

coursefeedback.syr.edu

Response rate of 85% or more: Extra participation credit for class

# TODAY

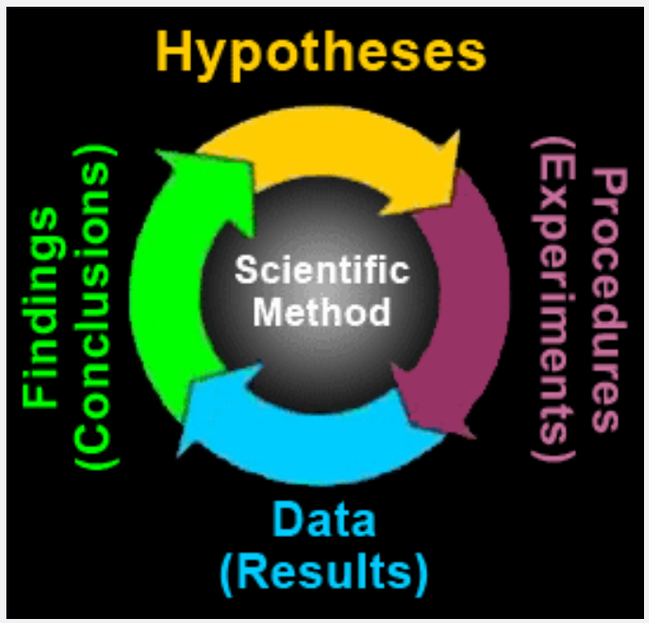
- Big Picture Review
- Review for exam, study guide

# SCIENCE

- Science is not about what you study, but about how you study it
- It’s about the procedure you use to conduct testing

# SCIENTIFIC PROCESS

- Formulate research question
- Propose explanation/theory, hypotheses
- Data collection process
- Use data to evaluate hypotheses
- Reassess explanation



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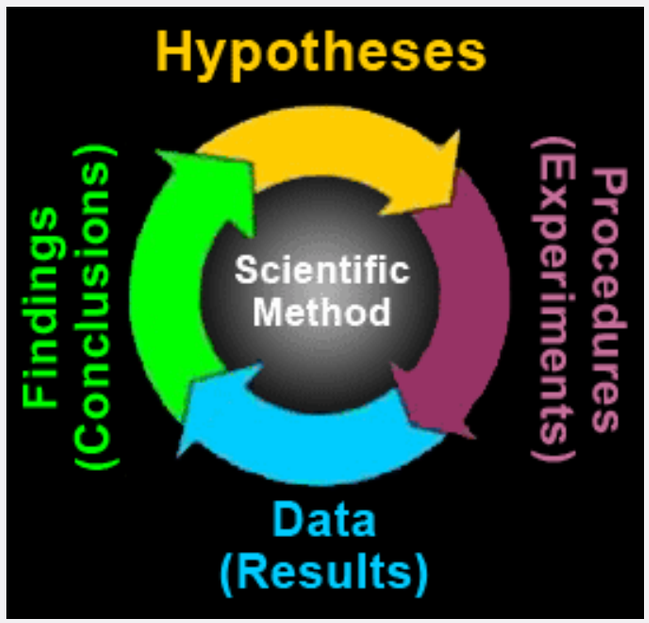

# HURDLES TO CAUSALITY

- Is there a credible causal mechanism that connects X to Y?
- Can we rule out the possibility that Y could cause X?
- Is there covariation between X and Y?
- Have we controlled for all confounding variables (Z) that might make the association between X and Y spurious?

# SCIENTIFIC PROCESS

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- Propose explanation/theory, hypotheses
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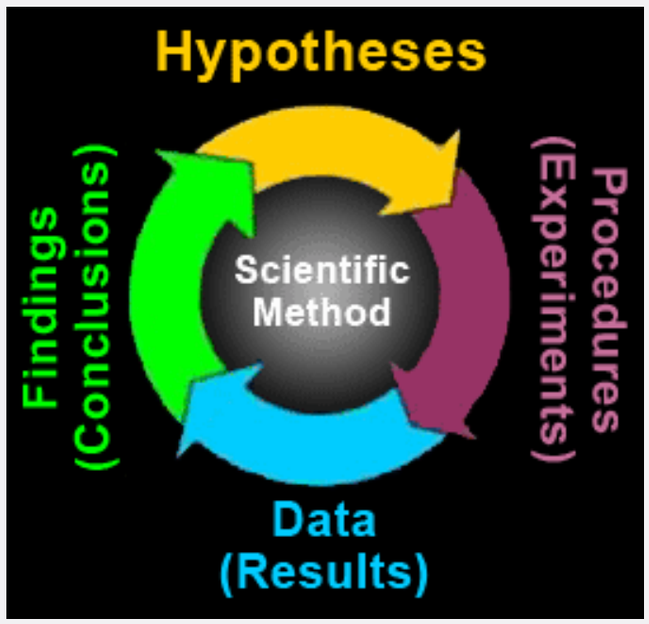

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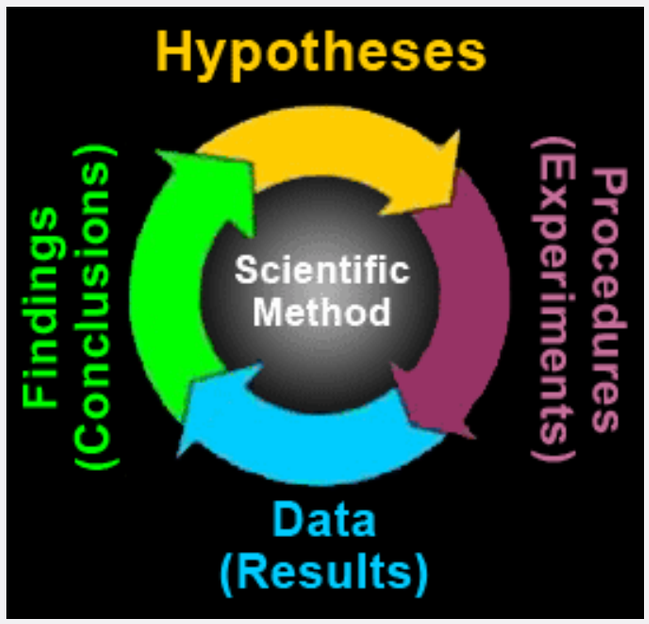

# HURDLES TO CAUSALITY

- **Is there a credible causal mechanism that connects X to Y?**
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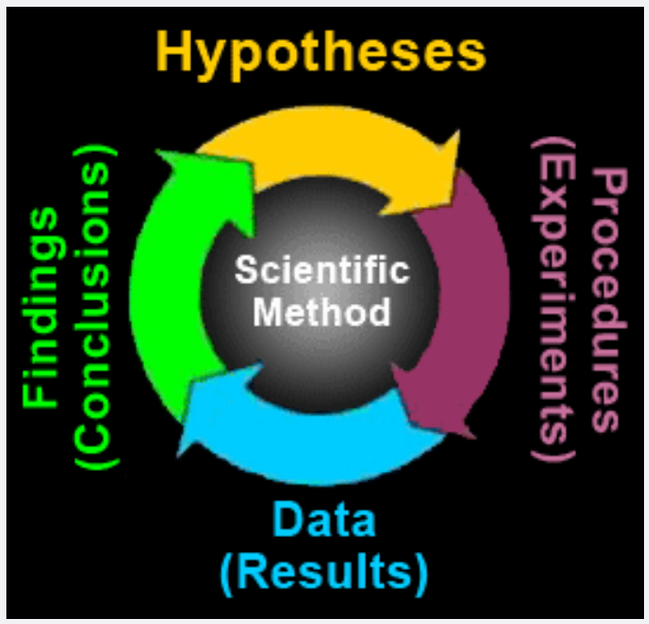

# TODAY

- Big Picture Review
- Review for exam, study guide

# EXAM

- Monday: Exam #3
  - Can bring a calculator (no phone etc.)
  - Allowed to bring one single-page letter-size (8.5x11) sheet with you. Front side only. What you put on it is up to you, but it has to be your own.
- If you take exams at CDR, please sign up now!

# STUDENT HOURS

- **Next Monday: 11-1**
- 530 Eggers or Zoom
  - Zoom info on syllabus

# EXAM

- Material covered
  - Everything from Apr 5 (Hypothesis Testing with One Confounder) to today

# HURDLES TO CAUSALITY

- Is there a credible causal mechanism that connects X to Y?
- Can we rule out the possibility that Y could cause X?
- Is there covariation between X and Y?
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# BIVARIATE RELATIONSHIP

Partisanship → Support for vaccine mandate

- Zero-order effect: Democrats are 39 percentage points more likely to support a vaccine mandate than Non-Democrats

# MAYBE THIS IS GOING ON?

**Gender (Z)**

**W more likely to be Democrats than M**

**W more supportive of vaccine mandate than M**

**Partisanship (X)** → **Vaccine Mandate (Y)**

**Partisanship by itself has no effect on vaccine mandate attitude**

# TERMINOLOGY

- Controlled effect: relationship between an independent variable (X) and a dependent variable (Y) within one value of another independent variable (Z)

# CONTROLLED COMPARISON TABLE

| Vaccine Mandate | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Non-Dem | Total | Dem | Non-Dem | Total |
| | 36% | | | 31% | | |
| Mandate | 71% (40) | 35% (8) | 61% (48) | 59% (10) | 28% (9) | 39% (19) |
| No Mandate | 29% (16) | 65% (15) | 39% (31) | 41% (7) | 72% (23) | 61% (30) |
| Total | 100% (56) | 100% (23) | 100% (79) | 100% (17) | 100% (32) | 100% (49) |

# CONTROLLED EFFECT

- Even when looking just among men, and just among women, partisanship still has an effect on support for vaccine mandate
- Effect of partisanship holds when “controlling for” gender

# SPURIOUS RELATIONSHIP

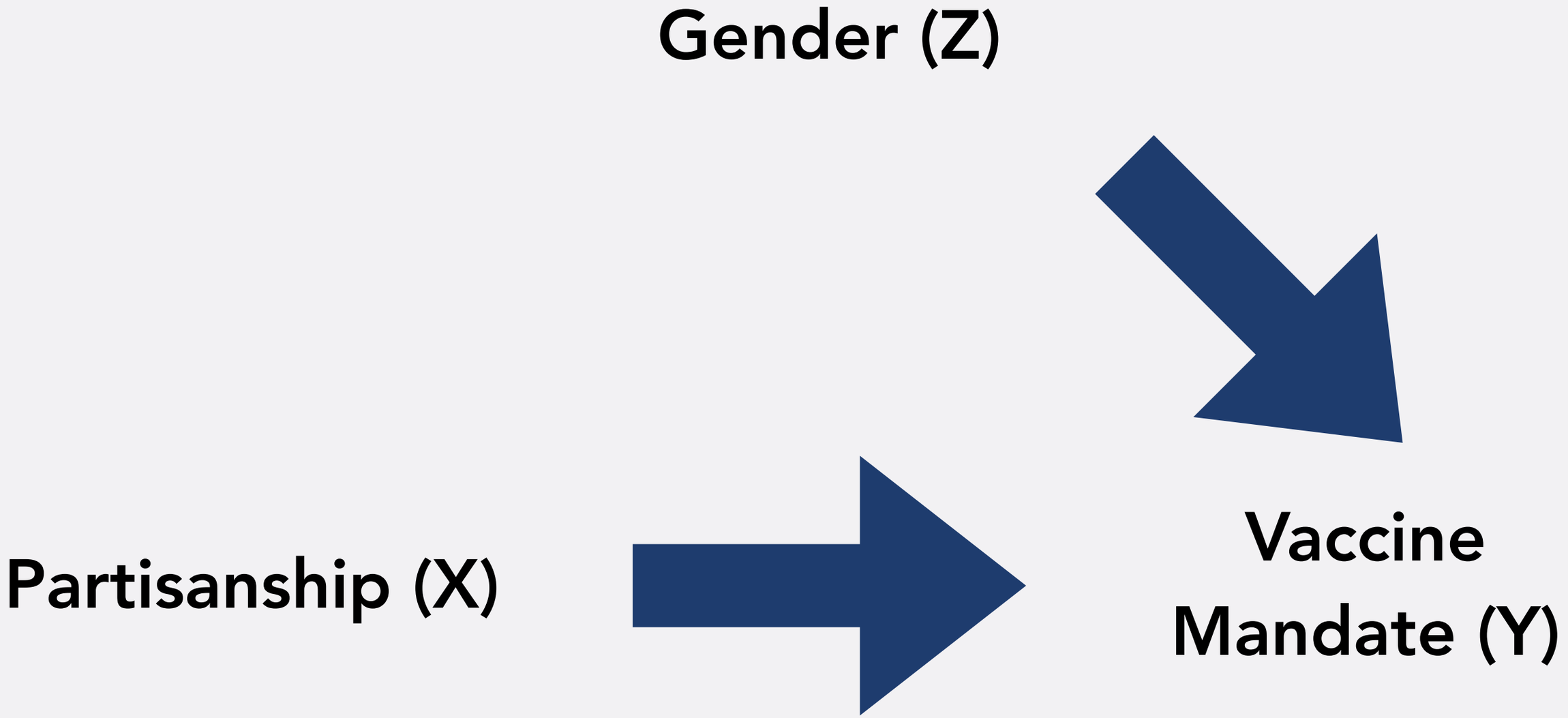
Gender (Z)

Partisanship (X)

Vaccine Mandate (Y)

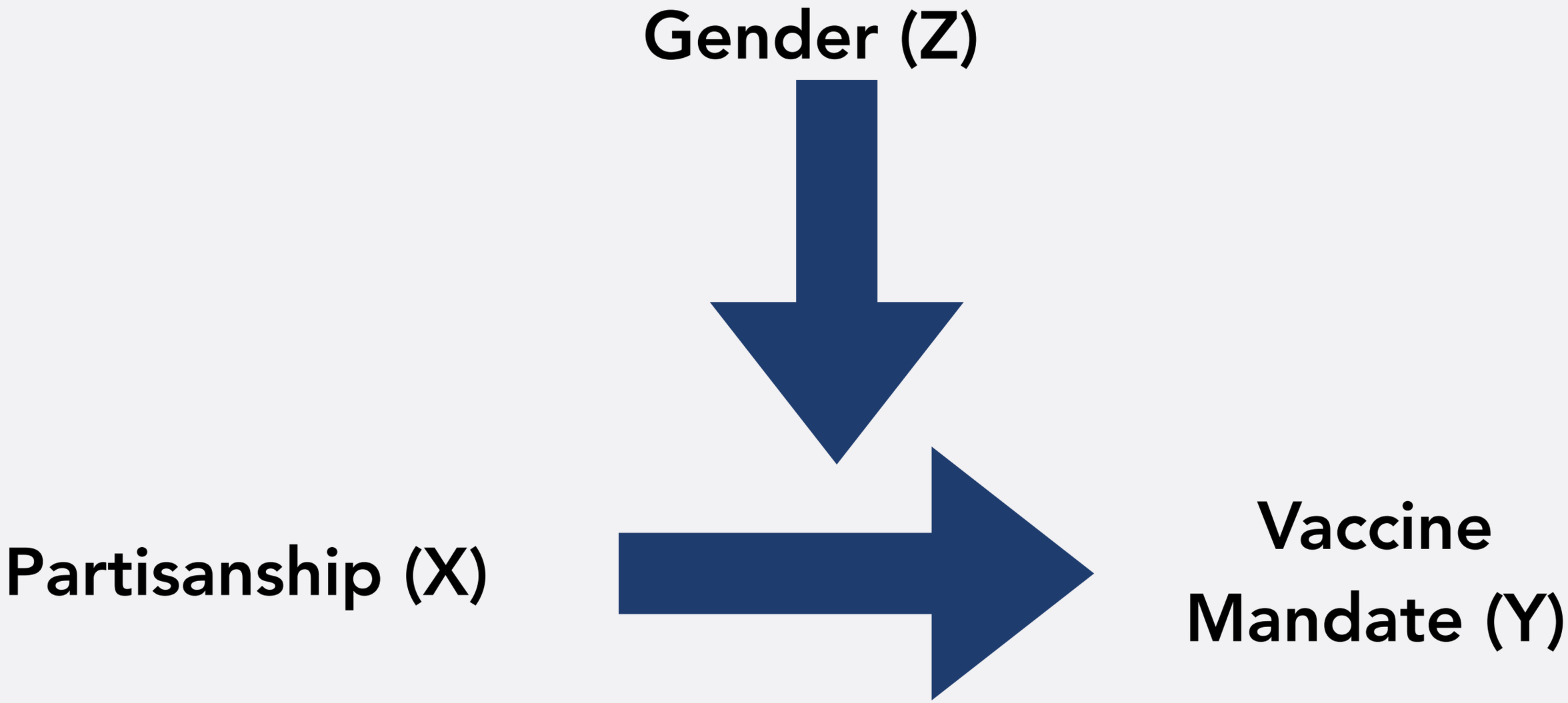
- Once we control for gender, no independent effect of partisanship
- All controlled effects zero or close to zero

# ADDITIVE RELATIONSHIP




- Both partisanship *and* gender determine Y
- Controlled effects not zero and of roughly same size

# INTERACTIVE RELATIONSHIP




- Gender determines how much partisanship affects Y
- Controlled effects not zero and of different size

# MULTIPLE REGRESSION

- Another way to control for potential confounding variables: multiple regression
- Allows us to control for many potential confounders

# DV: APPROVAL OF J. BIDEN

| | Coefficient | Standard Error | T-Value |
|---|---|---|---|
| Intercept | 92.1 | 28.1 | 3.28 |
| Liberal-Conservative | -0.41 | 0.08 | -4.96 |
| Age | -1.50 | 1.47 | -1.02 |
| Gender (Male) | -3.80 | 3.84 | -0.99 |

$R^2$: 0.26

# EFFECT OF LIB/CONS

- Coefficient: -0.41
- Interpretation: For every one point increase on the liberal-conservative scale, the evaluation of J. Biden decreases by 0.41 points, *holding all other independent variables constant*

# EFFECT OF LIB/CONS

$$t = \frac{H_A - H_0}{\text{Standard Error}}$$

$$t = \frac{-0.41 - 0.00}{0.08} = -5.13$$

- We reject $H_0$, so effect of liberal-conservative on evaluation is significant at the 5% level

# DV: APPROVAL OF J. BIDEN

| | Coefficient | Standard Error | T-Value |
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$R^2$: 0.26

# EFFECT OF GENDER

- Coefficient: -3.8
- Interpretation: If someone is male, their evaluation of J. Biden is expected to be 3.8 points lower than if someone is female, *holding all other independent variables constant*

# EFFECT OF GENDER

- **t-value: -0.99**
- **We do not reject $H_0$, so effect of gender on evaluation is not significant at the 5% level**

# DV: APPROVAL OF J. BIDEN

| | Coefficient | Standard Error | T-Value |
|---|---|---|---|
| Intercept | 92.1 | 28.1 | 3.28 |
| Liberal-Conservative | -0.41 | 0.08 | -4.96 |
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$R^2$: 0.26

# PREDICTED VALUE

- Evaluation = 92.1 - 0.41*Lib/Cons - 1.50*Age - 3.8*Gender (Male)
- Expected approval for someone who is:
  - 50 on Lib/Cons scale
  - 22 years old
  - Male

# PREDICTED VALUE

- Evaluation = 92.1 - 0.41*Lib/Cons - 1.50*Age - 3.8*Gender (Male)
- Expected approval for someone who is:
  - 50 on Lib/Cons scale
  - 22 years old
  - Male
- Evaluation = 92.1 - 0.41*50 - 1.50*22 - 3.8*1 = 34.8

# DV: APPROVAL OF J. BIDEN

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|---|---|---|---|
| Intercept | 92.1 | 28.1 | 3.28 |
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$R^2$: 0.26

# OBSERVATIONAL RESEARCH DESIGN

- Linear regression is (usually) used in observational research design
- Takes data as we find it in the world
- Regression isolates the independent effect of X on Y, controlling for other variables (=potential alternative explanations)

# OBSERVATIONAL RESEARCH DESIGN

- Can never be sure we controlled for all potential alternative explanations
- Potentially low internal validity

# EXPERIMENTAL RESEARCH DESIGN

- Researchers *actively decide* assignment of the independent variable
- Treatment and control groups
  - Subjects randomly allocated

# EXPERIMENTAL RESEARCH DESIGN

- On average, treatment and control group are the same on *every* variable we can think of
- *Except* on the independent variable of interest, where researcher assigns treatment and control
- Unlikely that differences in Y between treatment and control groups caused by other variables
- High internal validity

# EXPERIMENTAL RESEARCH DESIGN

- Different types of experiments
  - Field experiment
  - Lab experiment
  - Survey experiment
  - Natural experiment

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- Different types of experiments
  - Field experiment
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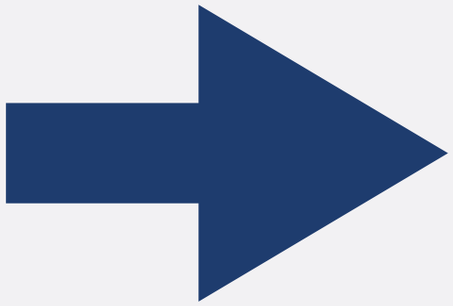
# SCHOOL CHOICE

Attending state flagship university



Later Earnings

- What is effect of attending state flagship university vs. other public university?

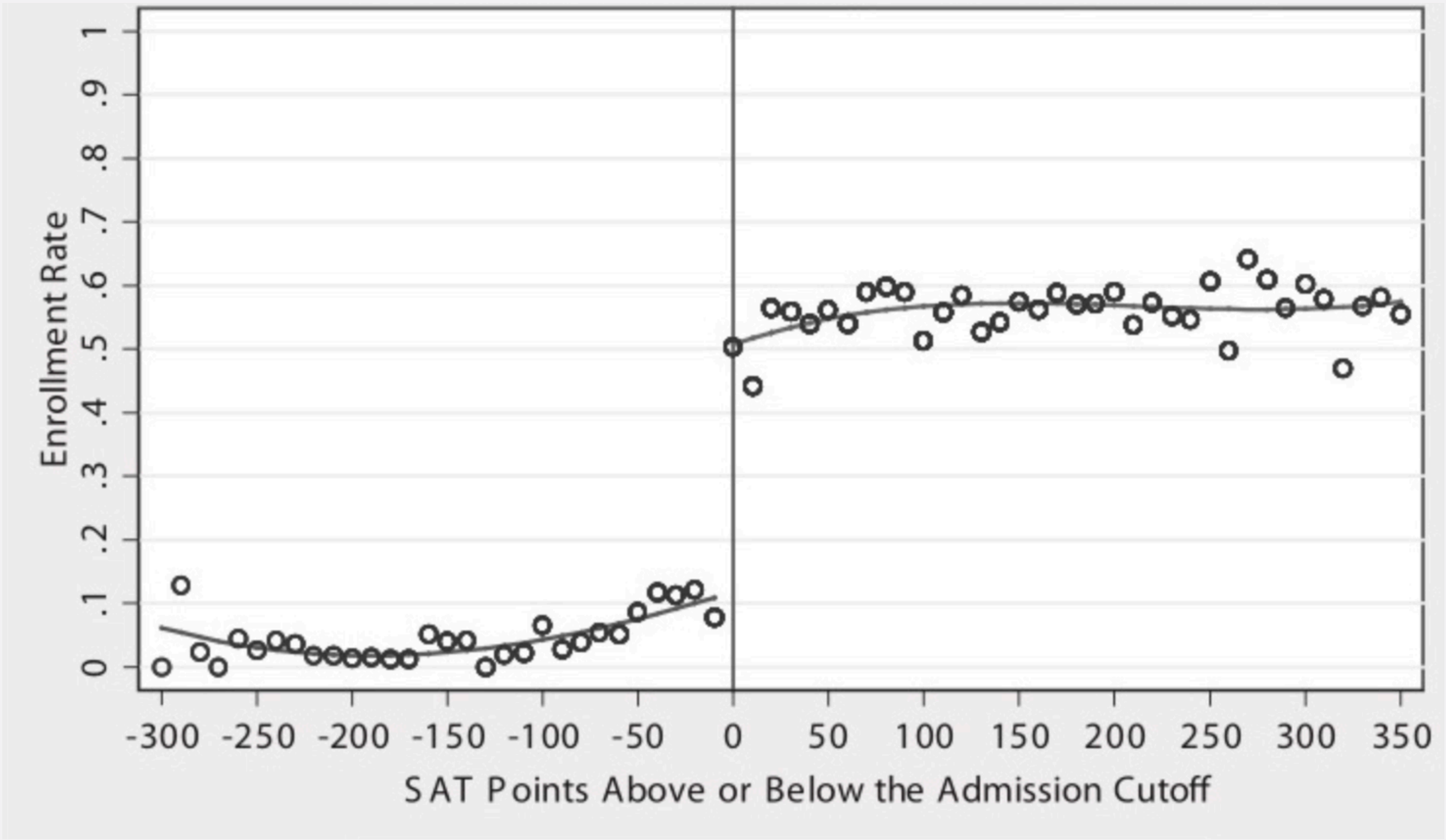
# EFFECTS OF SCHOOLS

- Flagship universities are more selective
- Students who attend flagships are different from students who don’t in many ways
  - Ability, work ethic, family background, etc.
- So, again, difficult to establish causal effect of attending flagships

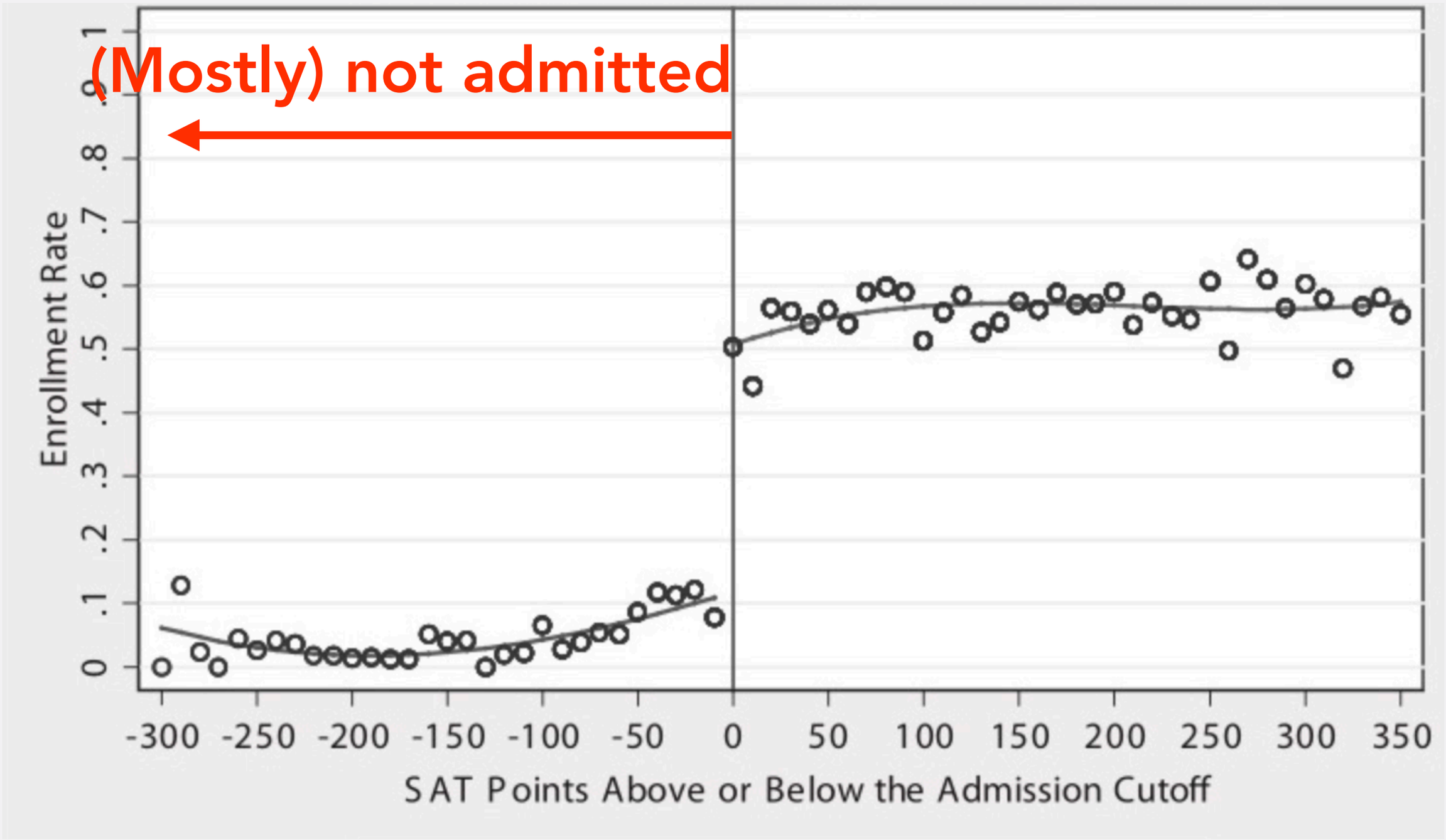
# EFFECTS OF SCHOOLS

- Hoekstra (2009) analyzes admissions data from the University of Florida
  - School places a lot of emphasis on SAT score
  - Has an admissions cutoff: if student is above it they are admitted, if students are below it they are (mostly) not admitted

# EFFECTS OF SCHOOLS



# EFFECTS OF SCHOOLS



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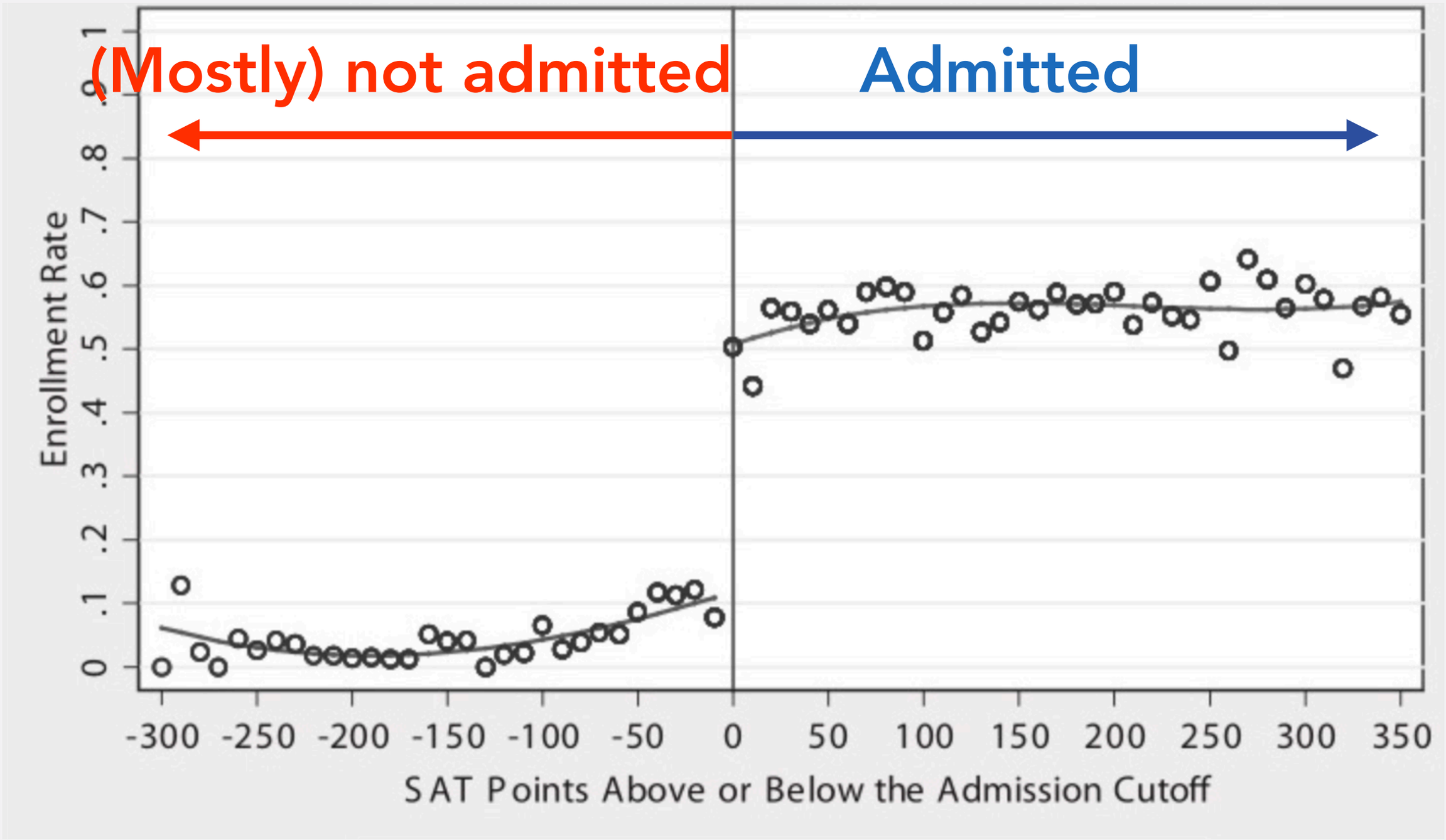
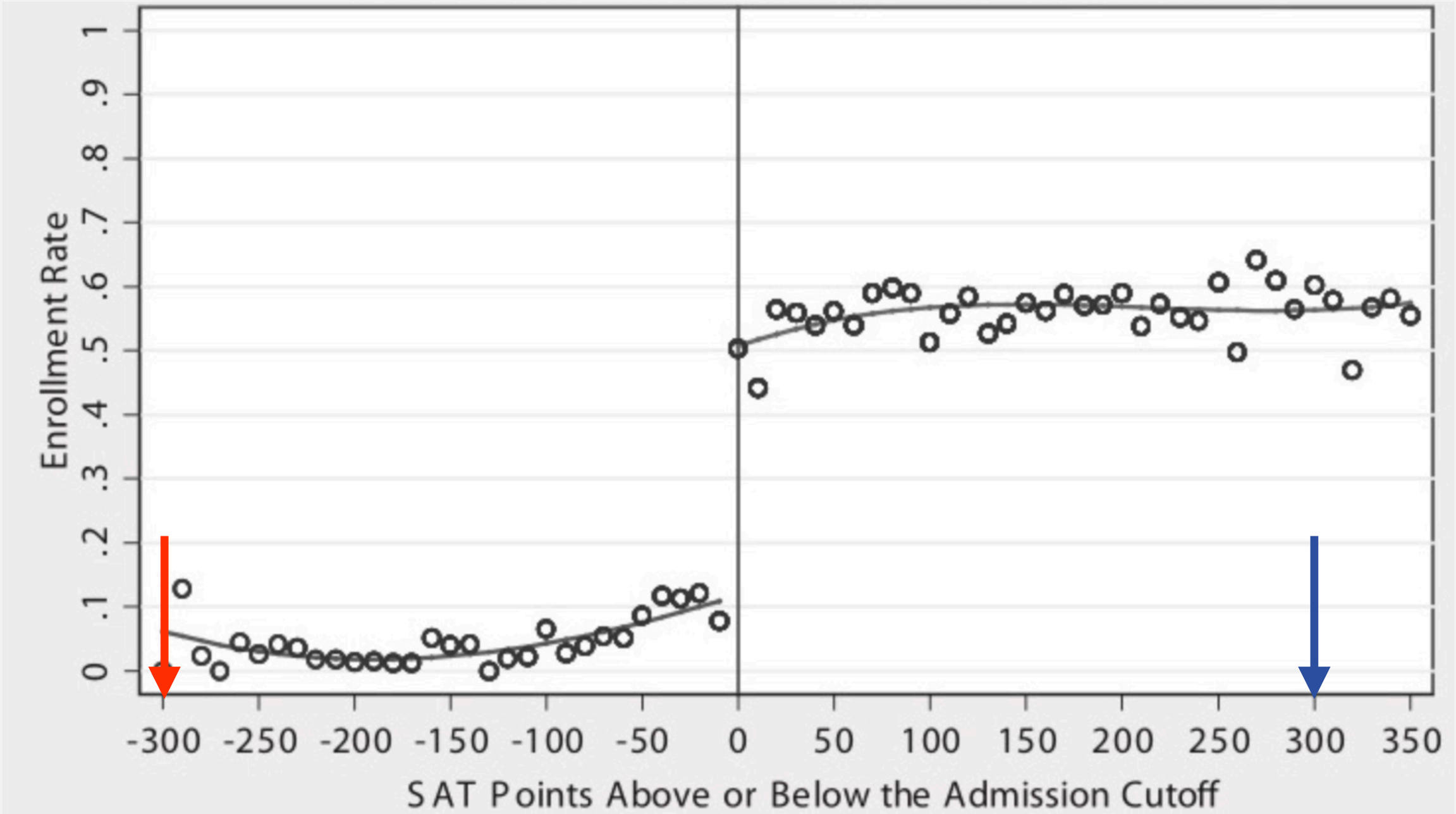
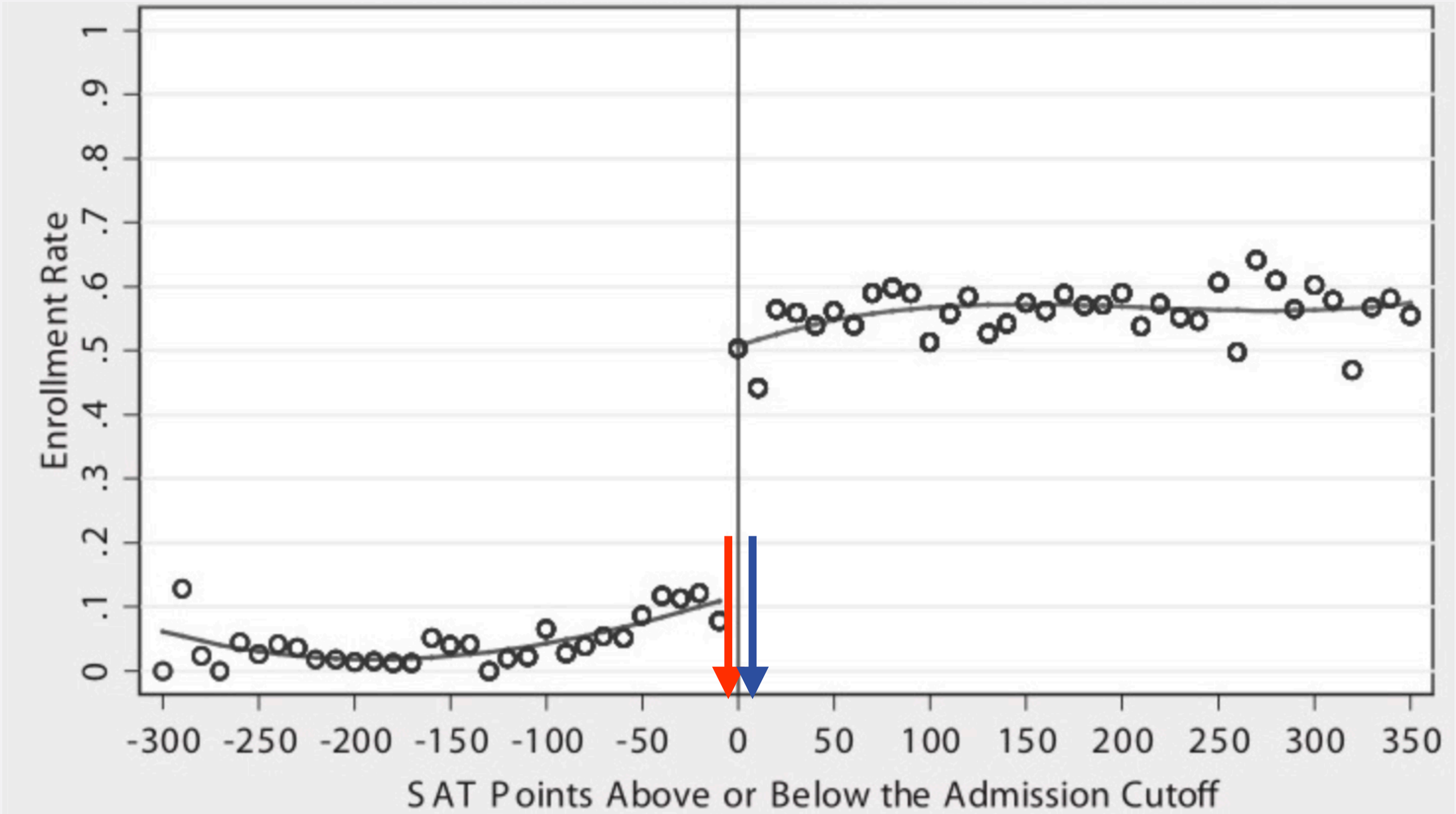


# EFFECTS OF SCHOOLS



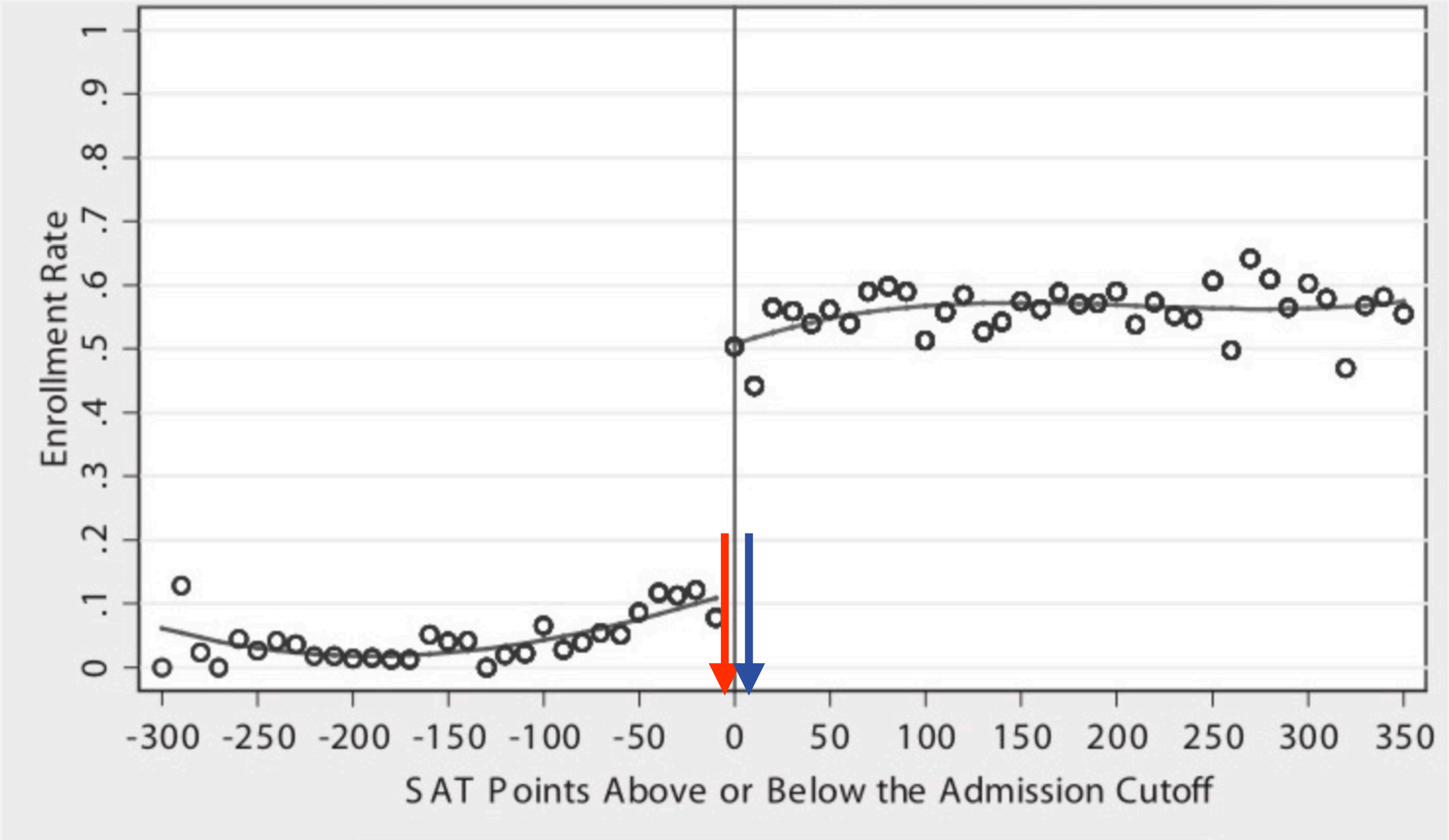

- **Students 300 points above cutoff are very different from students 300 points below cutoff**
  - **e.g. "smarter", work harder, etc.**

# EFFECTS OF SCHOOLS



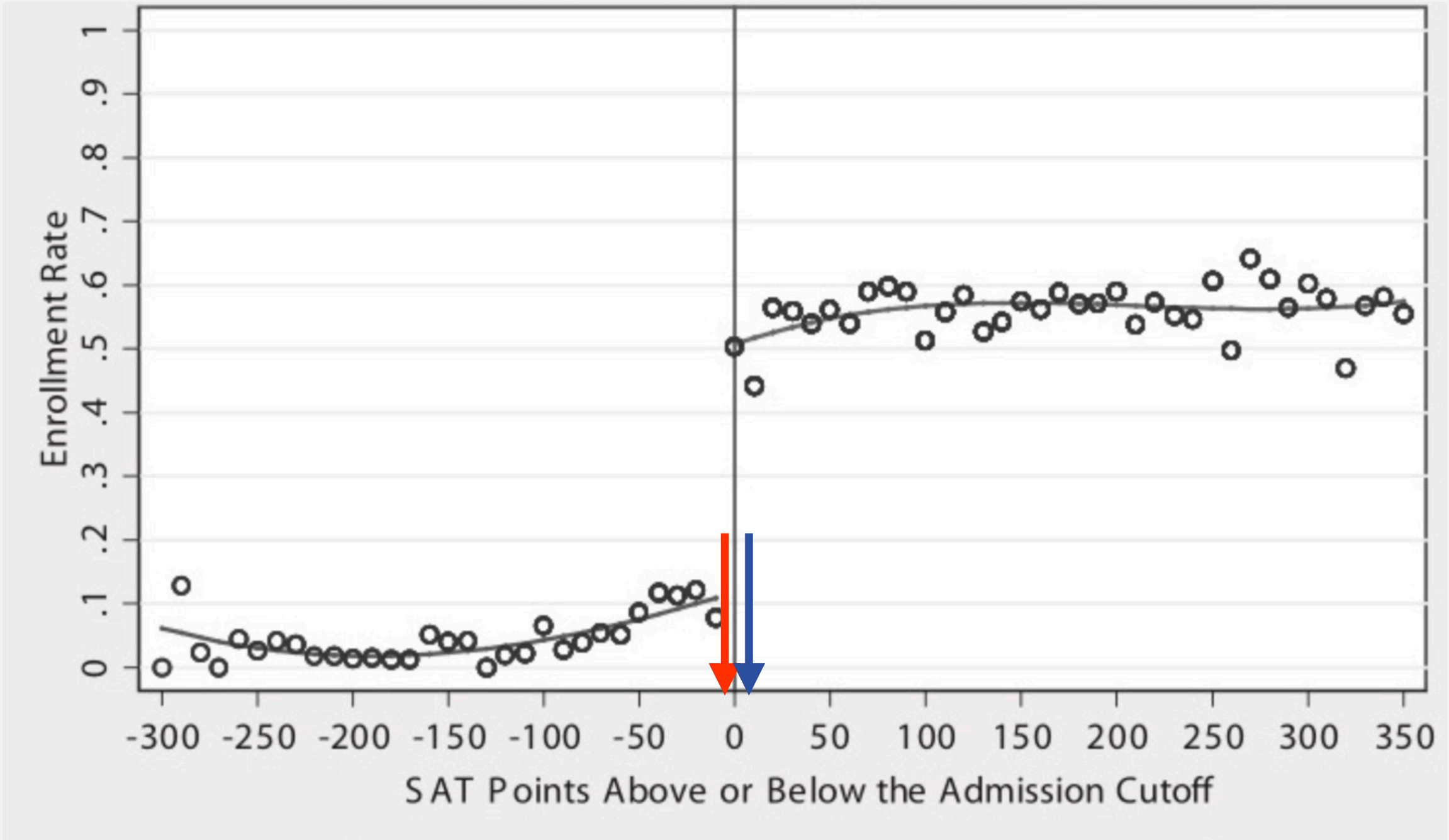

- **Students 2 or 3 points above cutoff are *not* very different from students 2 or 3 points below cutoff**
  - On average, about equally smart, work equally hard etc.

# EFFECTS OF SCHOOLS




- If students got SAT score just above or just below admissions cutoff is pretty much random

# EFFECTS OF SCHOOLS

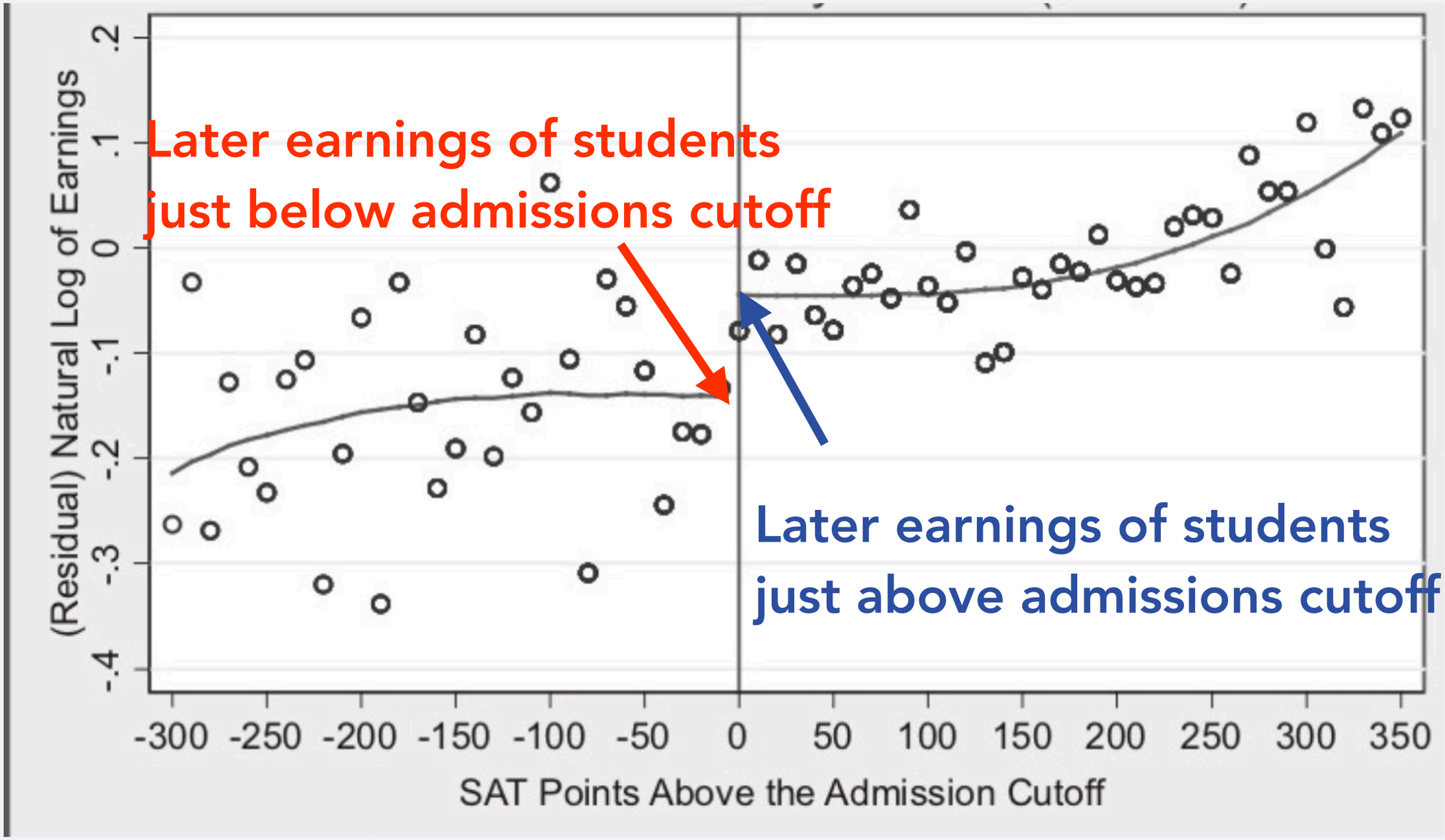



- So near the cutoff, admission to flagship university is (as good as) random

# REGRESSION DISCONTINUITY

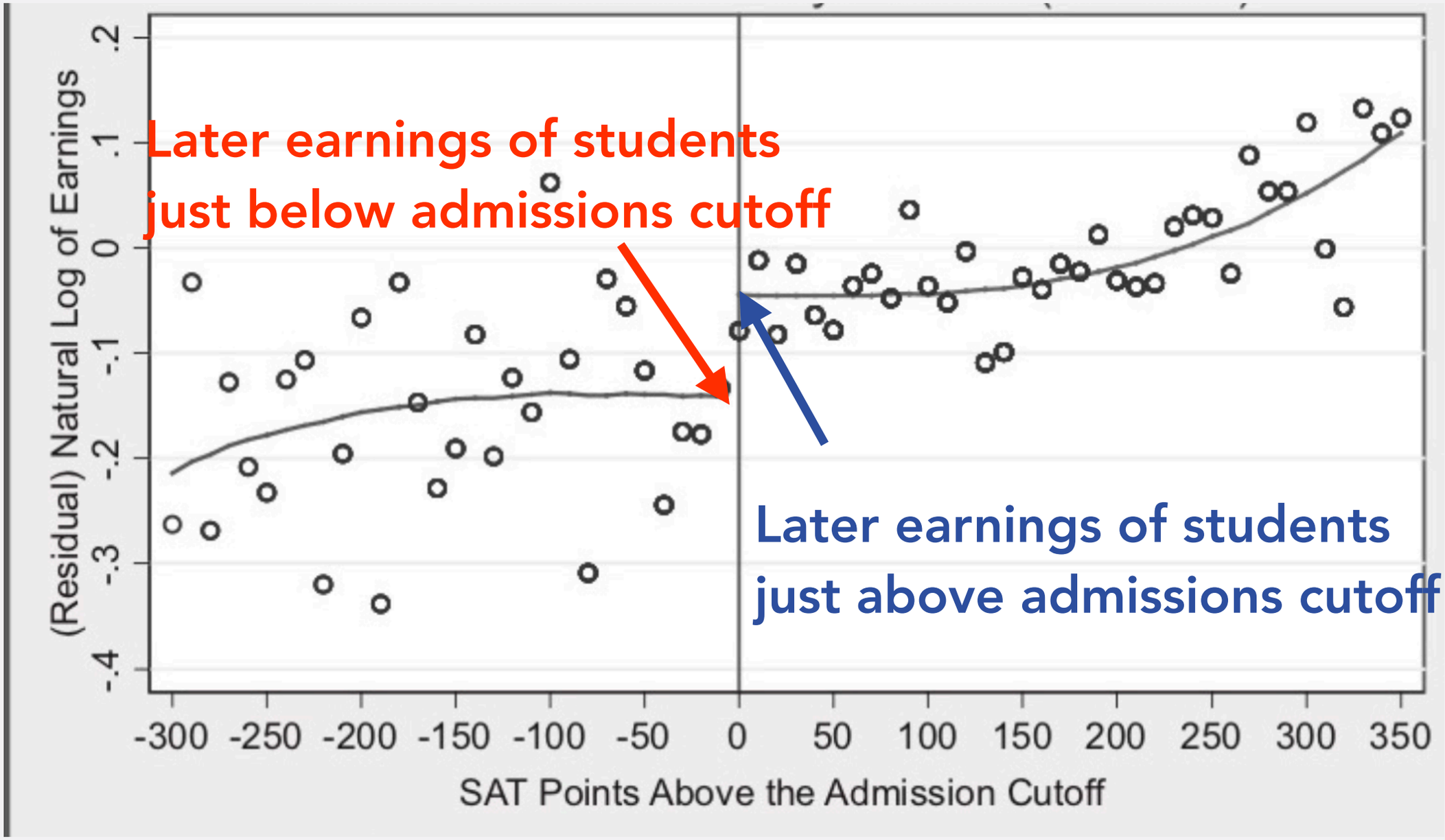
- We can compare later earnings between students whose SAT scores were *just above* the admissions cutoff and those whose scores were *just below* it
- On average, students just above and just below cutoff are similar on all characteristics
- Except some went to the flagship university, others did not

# EFFECTS OF SCHOOLS




- Students who (essentially by luck) got into flagship earn about 10% more than students who (essentially through bad luck) did not get in

# EFFECTS OF SCHOOLS




- **This earnings difference at the cutoff cannot be explained by differences in characteristics between students**

# SUMMARY

- Experiments
  - No need to control for all possible confounders
  - Great if you can do them
  - But: Concerns about external validity, ethics, cannot be done everywhere
- Natural experiments
  - Situations where the real world produces something that is quasi-random
  - Useful when experiments are not possible
  - But: quasi-randomness in real world is rare