

# In-person session 10

**March 24, 2022**

PMAP 8521: Program evaluation  
Andrew Young School of Policy Studies

# Plan for today

**Diff-in-diff effect sizes**

**Miscellaneous R stuff**

**RDD fun times**

# Diff-in-diff effect sizes

**What the heck is happening at  
the end of problem set 5?!**

# Miscellaneous R stuff

**Is there a way to make  
the date update automatically  
in the title area?**

# Lines across categories

**What do all those things like  
"AIC" mean in model tables?**

**(And do we care about them?)**



**Can we control what  
shows up in those tables?**

See this

# RDD fun times

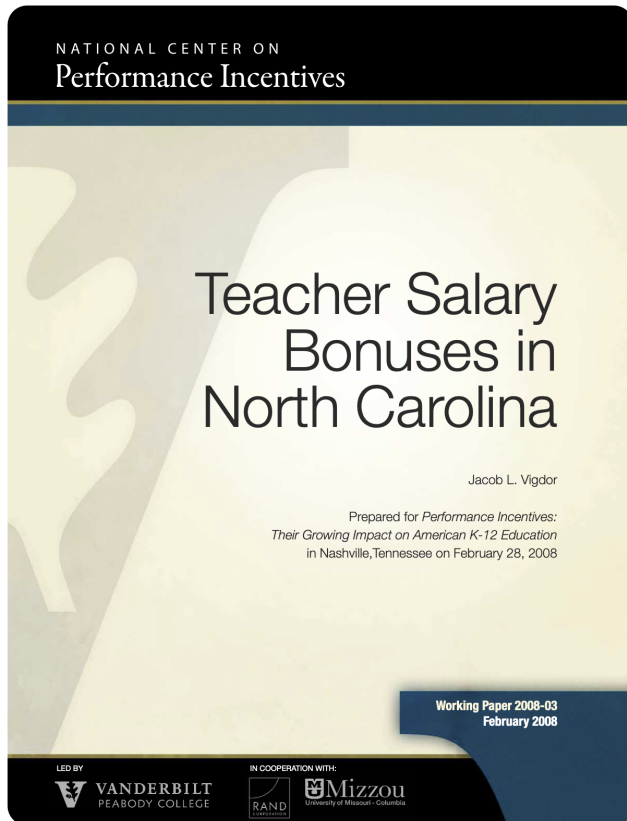
**With RDD we rely on "the rule" to  
determine treatment and control groups**

**How do you decide on the rule?  
You mentioned that it's arbitrary—  
we can choose whatever rule we want?**

**Can we use RDD to evaluate a program that doesn't have a rule for participation?**

**Is there a rule of thumb to determine which quasi-experimental method we should use?**

**How do we know which method applies to which circumstance? Does the data tell us?**



Teachers in North Carolina Public schools earn a bonus of \$750 if the students in their school meet a standard called "expected growth." A summary statistic called "average growth" is computed for each school; the expected growth standard is met when this summary measure exceeds zero.

Does getting a bonus in year  $t$  cause improved student performance in year  $t + 1$ ?

**How common are these kinds of rules  
in the real world?**



**Andrew Heiss**

@andrewheiss



changing my behavior at the discontinuity by holding off on finishing a couple books until saturday so they count in my 2022 goodreads stats

11:51 PM · Dec 30, 2021 · Twitter for iPhone



**Andrew Heiss** @andrewheiss · Dec 30, 2021



Replying to [@andrewheiss](#)

what're you gonna do about that, econometricians??



**Where do these eligibility thresholds come from? Do policy makers research them first and reexamine them later?**

# Discontinuities everywhere!

| Size | Annual   | Monthly | 138%     | 150%     | 200%     |
|------|----------|---------|----------|----------|----------|
| 1    | \$12,760 | \$1,063 | \$17,609 | \$19,140 | \$25,520 |
| 2    | \$17,240 | \$1,437 | \$23,791 | \$25,860 | \$34,480 |
| 3    | \$21,720 | \$1,810 | \$29,974 | \$32,580 | \$43,440 |
| 4    | \$26,200 | \$2,183 | \$36,156 | \$39,300 | \$52,400 |
| 5    | \$30,680 | \$2,557 | \$42,338 | \$46,020 | \$61,360 |
| 6    | \$35,160 | \$2,930 | \$48,521 | \$52,740 | \$70,320 |
| 7    | \$39,640 | \$3,303 | \$54,703 | \$59,460 | \$79,280 |
| 8    | \$44,120 | \$3,677 | \$60,886 | \$66,180 | \$88,240 |

**Medicaid**  
138%\*

**ACA subsidies**  
138–400%\*

**CHIP**  
200%

**SNAP/Free lunch**  
130%

**Reduced lunch**  
130–185%

# The US's official poverty measure



Mollie Orshansky

**Formula created in 1963**

**Based solely on food expenses from a survey of household budgets in 1955**

# The US's official poverty measure

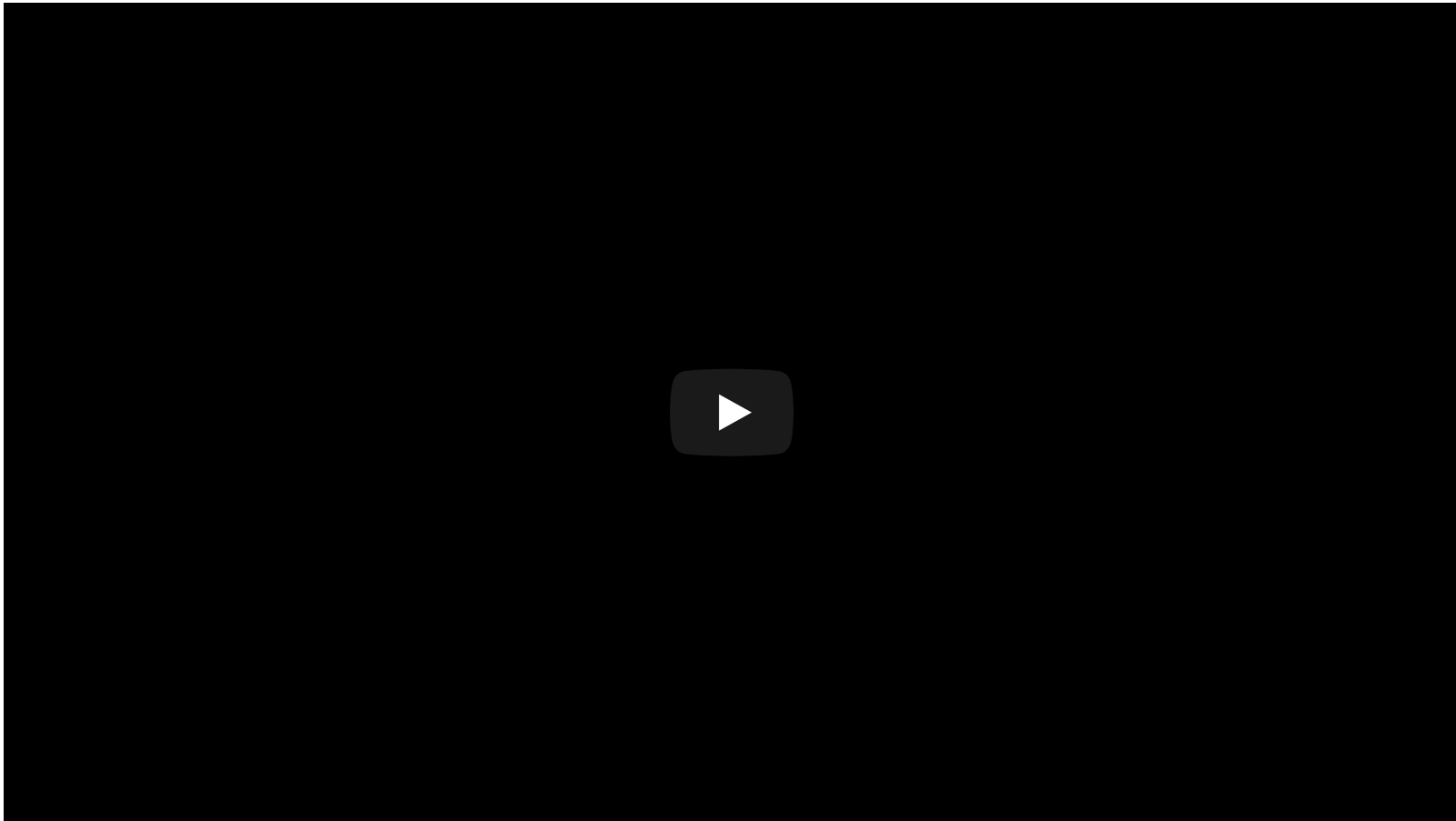
Official formula:

**1955 annual food budget × 3**

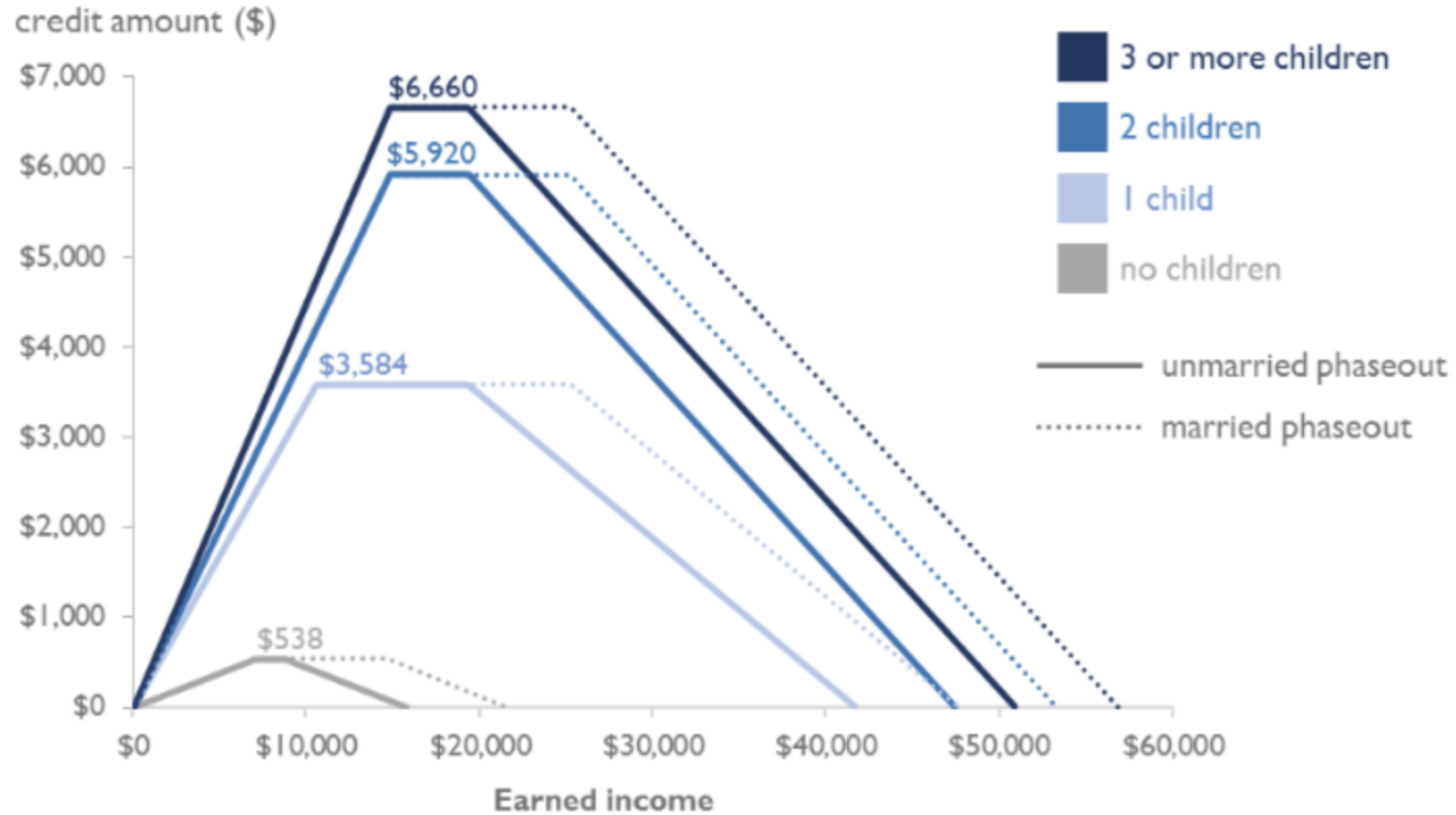
That's all!

In 1963 poverty line was 50% of median income;  
in 2005 it was 28%; 18% today

## Why don't we change it?



## EITC Amount by Number of Qualifying Children, Marital Status, and Income, 2020





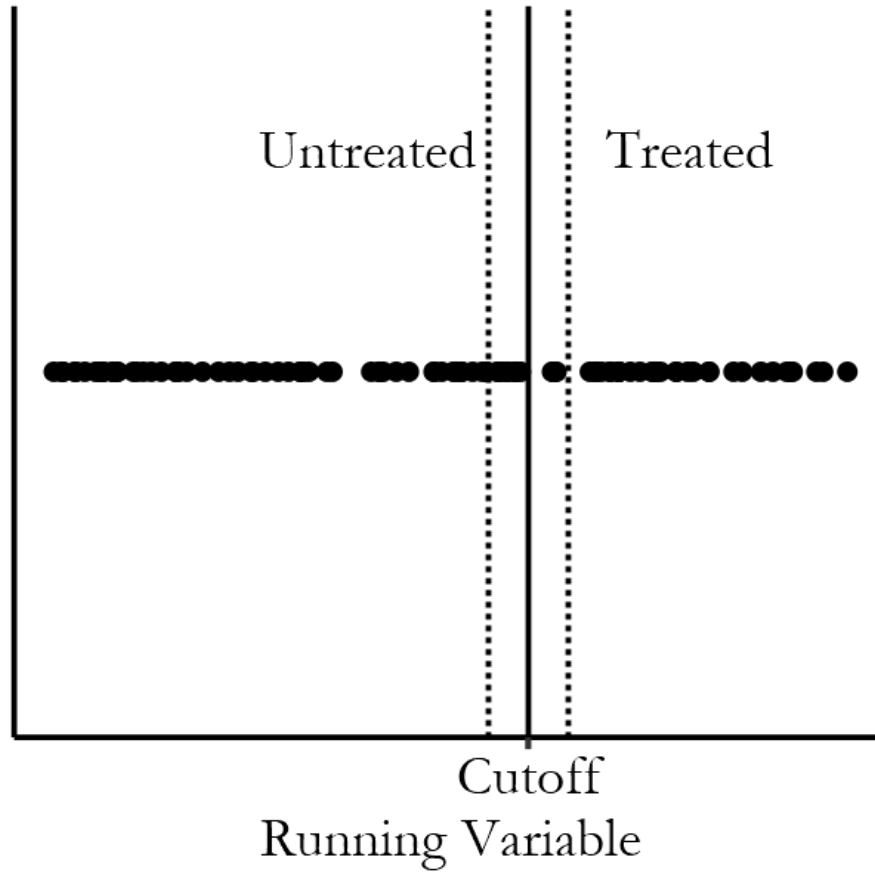
# What if there are multiple cutoffs?

College admission is based on GPA *and* test scores...

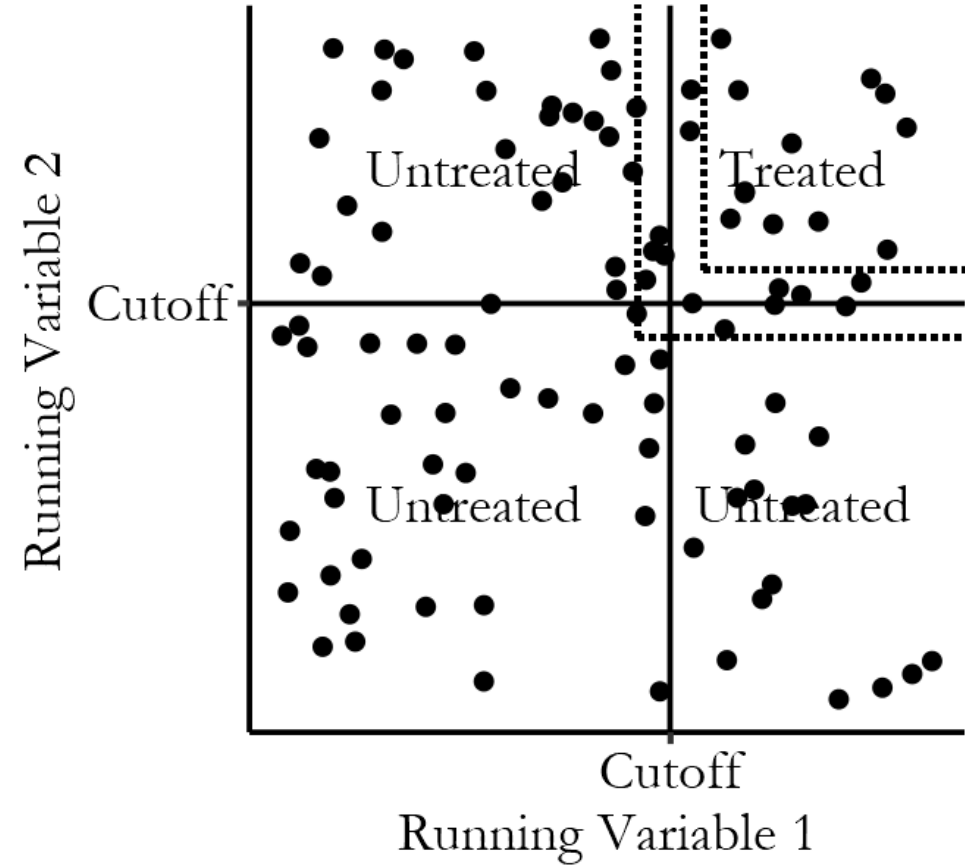
WIC/SNAP/Medicaid are based on income *and* family size...



(a) One Running Variable

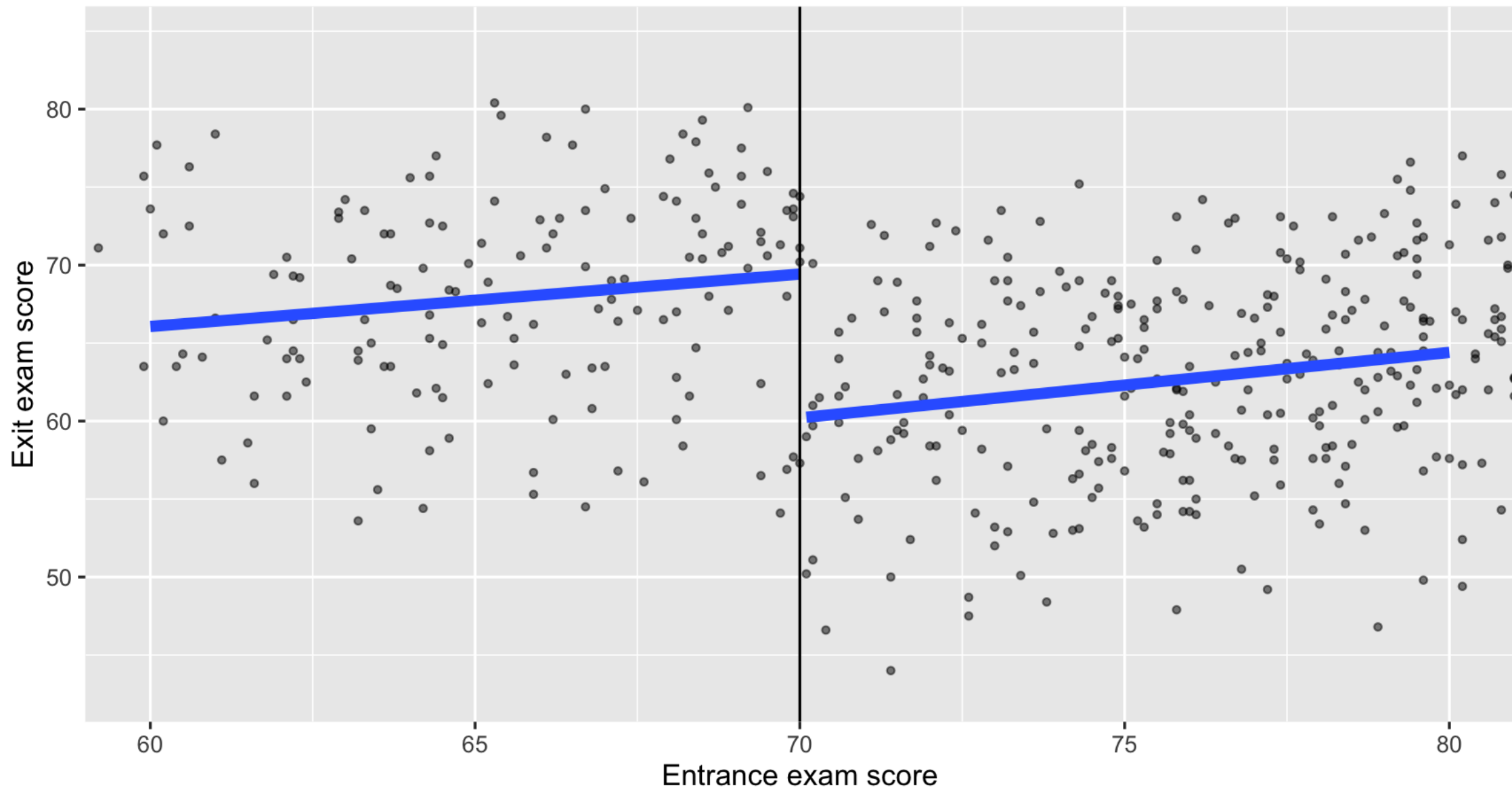


(b) Multiple Running Variables



**Why do we center  
the running variable?**

**Regression is just fancy averages!**



```
lm(exit_exam ~ entrance_exam + tutoring,  
  data = filter(tutoring, entrance_exam <= 80,  
                entrance_exam >= 60)) %>%  
tidy()
```

```
## # A tibble: 3 × 5
```

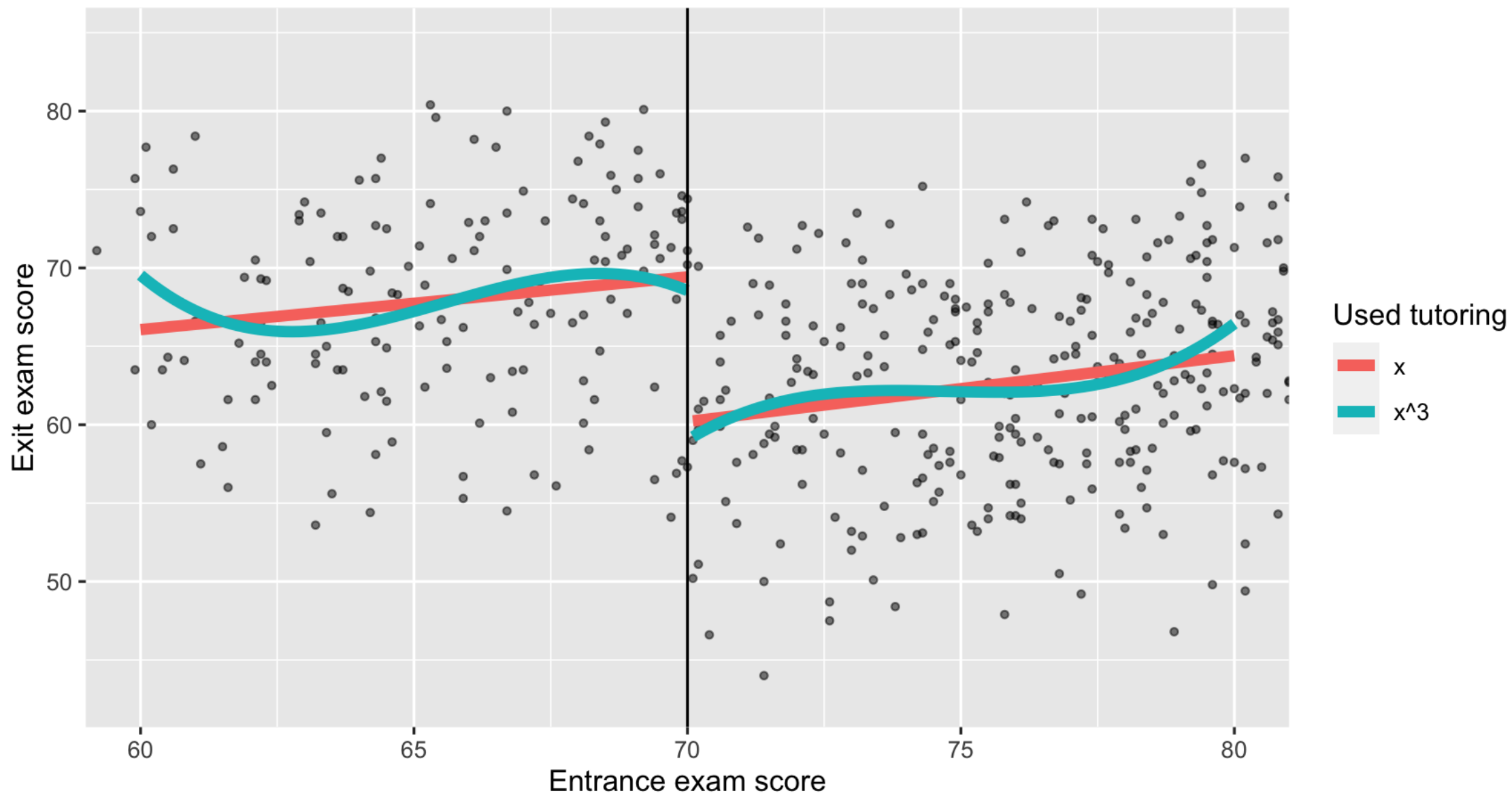
| ##   | term          | estimate | std.error | statistic | p.value  |
|------|---------------|----------|-----------|-----------|----------|
| ##   | <chr>         | <dbl>    | <dbl>     | <dbl>     | <dbl>    |
| ## 1 | (Intercept)   | 33.2     | 8.64      | 3.84      | 1.43e- 4 |
| ## 2 | entrance_exam | 0.388    | 0.114     | 3.40      | 7.45e- 4 |
| ## 3 | tutoringTRUE  | 9.27     | 1.31      | 7.09      | 6.27e-12 |

```
tutoring_centered <- tutoring %>%
  mutate(entrance_centered = entrance_exam - 70)

lm(exit_exam ~ entrance_centered + tutoring,
  data = filter(tutoring_centered, entrance_exam <= 80,
    entrance_exam >= 60)) %>%
  tidy()
```

```
## # A tibble: 3 × 5
```

| ##   | term              | estimate | std.error | statistic | p.value   |
|------|-------------------|----------|-----------|-----------|-----------|
| ##   | <chr>             | <dbl>    | <dbl>     | <dbl>     | <dbl>     |
| ## 1 | (Intercept)       | 60.4     | 0.752     | 80.3      | 2.99e-249 |
| ## 2 | entrance_centered | 0.388    | 0.114     | 3.40      | 7.45e- 4  |
| ## 3 | tutoringTRUE      | 9.27     | 1.31      | 7.09      | 6.27e- 12 |



**What's the difference between weighting with kernels and inverse probability weighting?**



**There must be some math behind for the non-parametric lines. Should we care about that or should we just trust in R?**

# How do we decide on the right model?

- Parametric with  $y = x$ ?
- With  $y = x^2 + x$ ?
- With  $y = x^{\text{whatever}} + x^{\text{whatever}} + x$ ?
- Nonparametric?
- `rdrobust()` or just `lm()`?
- Controls or no controls?

**How do you justify a bandwidth?**

**Does the bandwidth need to be the same on both sides?**

**How should we think about the impact of the program on people who score really high or low on the running variable?**

**If we're throwing most of the data away and only looking at a narrow bandwidth of people, what does this say about generalizability?**

**What do we do about noncompliance?**

**What is fuzzy regression discontinuity?**

**RD play time!**