In-person session 4

February 2, 2023

PMAP 8521: Program evaluation
Andrew Young School of Policy Studies

Plan for today

Super quick R FAQs

Regression!

Measuring outcomes

DAGs

Quick useful R tips

Weird figure/table placement in PDFs

Figure sizing in R

Figure and table captions and numbers

Make nicer tables when knitting with `kable()`

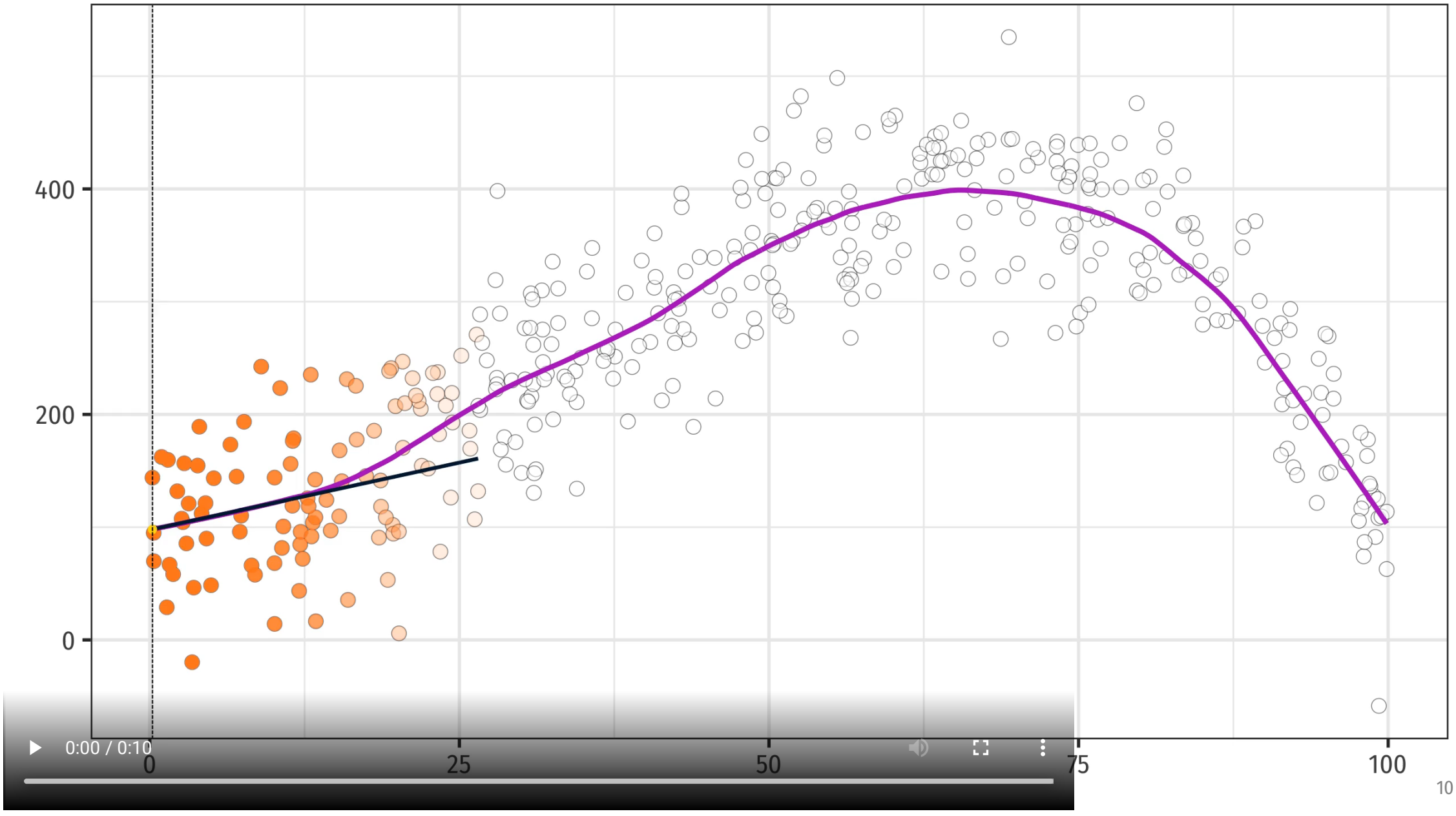
(Or even fancier tables with kableExtra!)

Regression!

Drawing lines through points

https://evalsp23.classes.andrewheiss.com/slides/02-slides.html#17

Locally estimated/weighted scatterplot smoothing (LOESS/LOWESS) is a common method (but not the only one!)


400
200
0
0
25
50
75
100
0:00 / 0:10

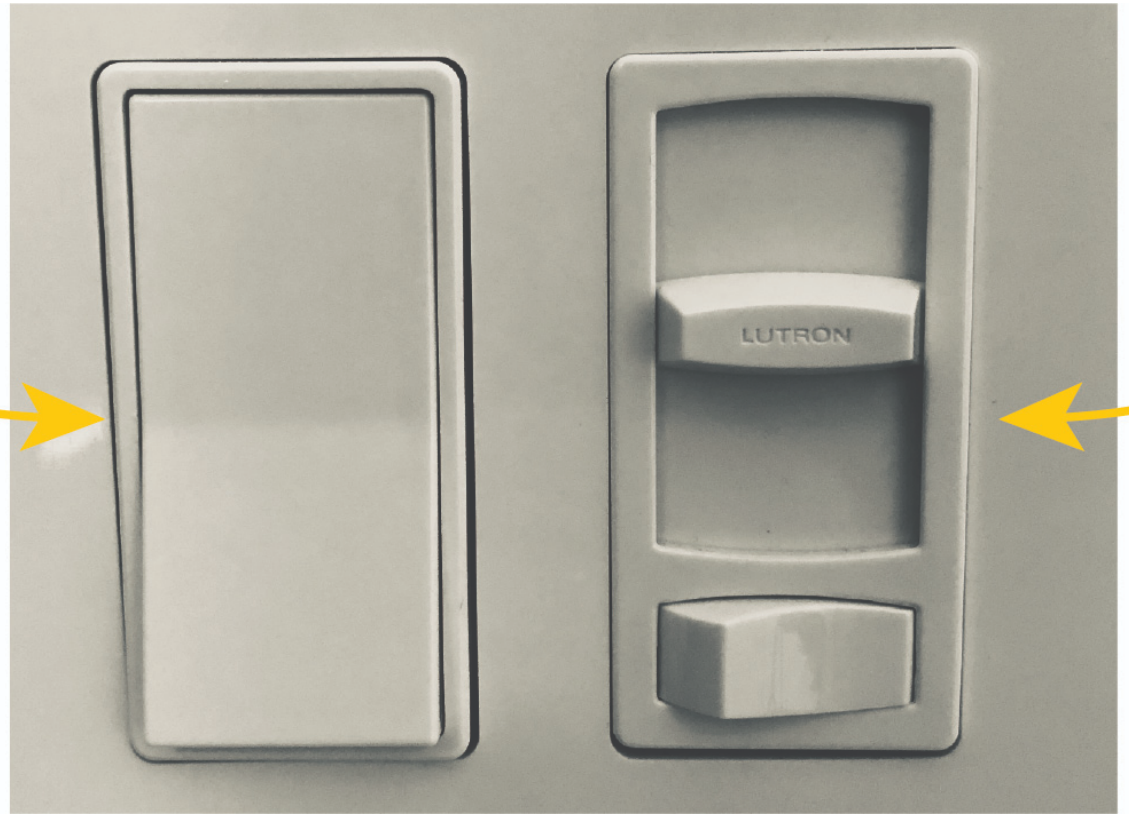
Regression equations

And is the intercept ever useful, or should we always ignore it?

What does it mean to hold something constant?

Why is one category always left out when you use a categorical variable?

Categorical variable



Continuous variable

Many simultaneous continuous variables

Many simultaneous categorical variables

Why use two steps to create a regression in R? (i.e. assigning it to an object with <-?)

Why use `tidy()` from the broom package?

How was the 0.05 significance threshold determined?

Could we say something is significant if $p > 0.05$, but just note that it is at a higher p-value?
Or does it have to fall under 0.05?

Why all this convoluted logic of null worlds?

Different "dialects" of statistics

Frequentist

$$P(\text{data} \mid H_0)$$

"Regular" statistics; what you've learned (and are learning here)

Bayesian

$$P(H \mid \text{data})$$

Requires lots of computational power

Do we care about the actual coefficients or just whether or not they're significant?

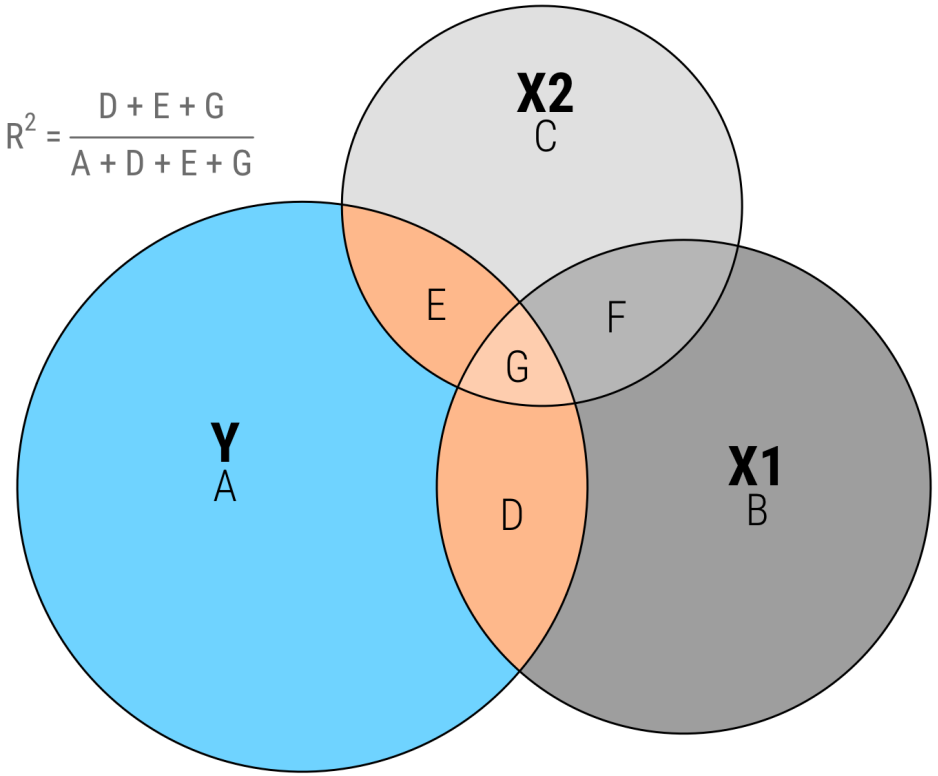
How does significance relate to causation?

If we can't use statistics to assert causation how are we going to use this information in program evaluation?

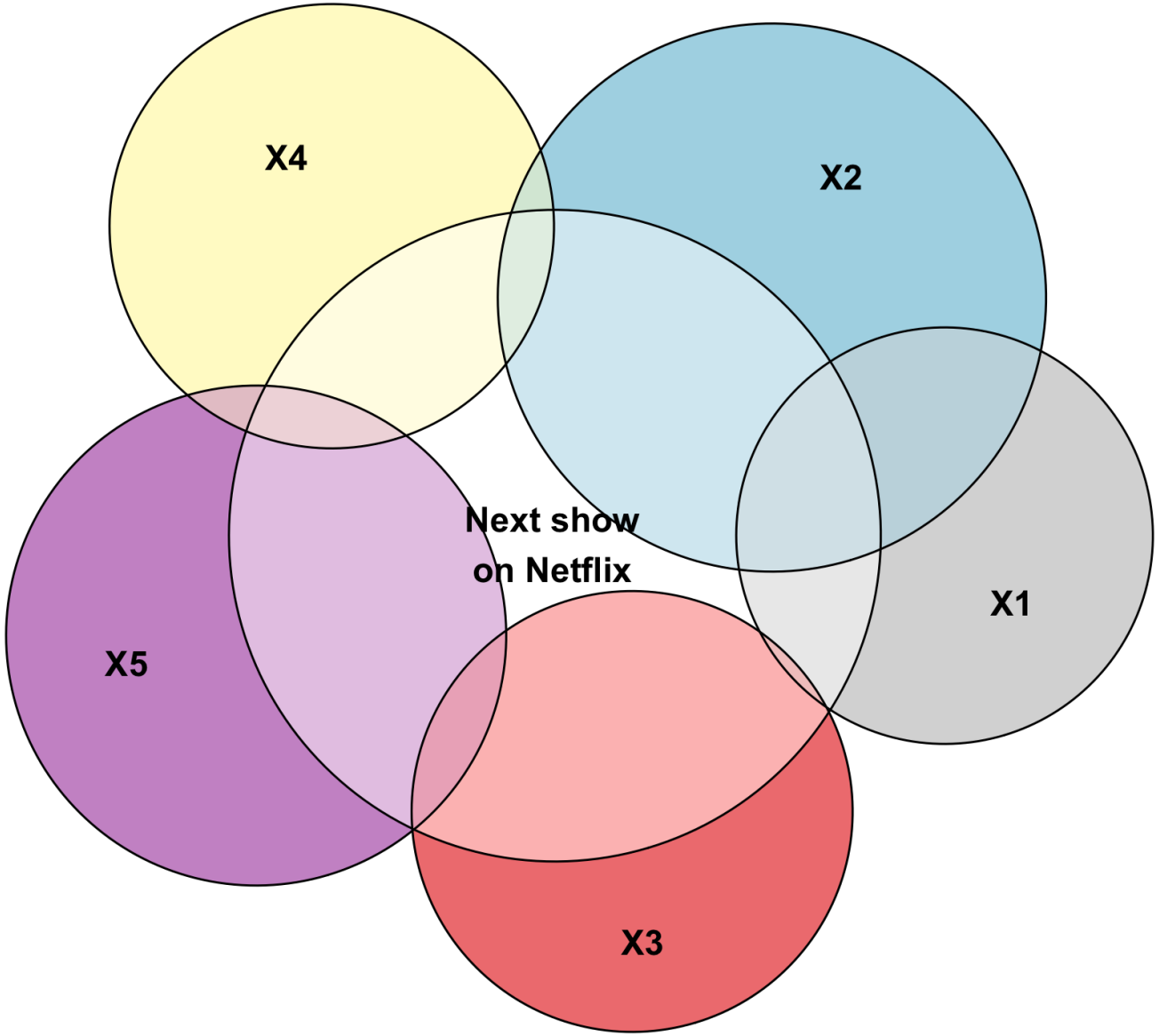
What counts as a "good" R^2?

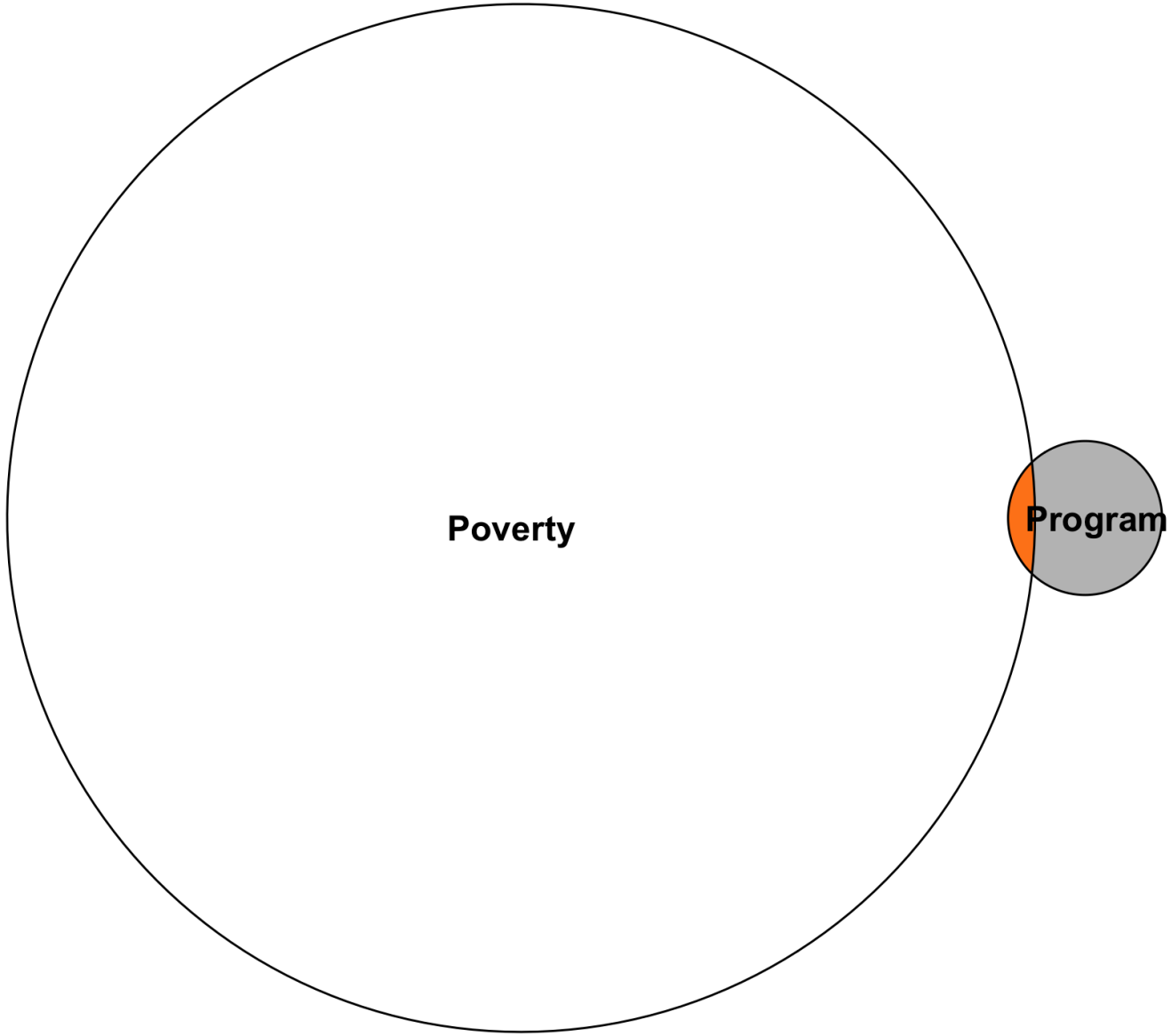
R^2 represented as an Euler diagram

Orange area (D + E + G) shows the total variance in outcome Y that is jointly explained by X1 and X2



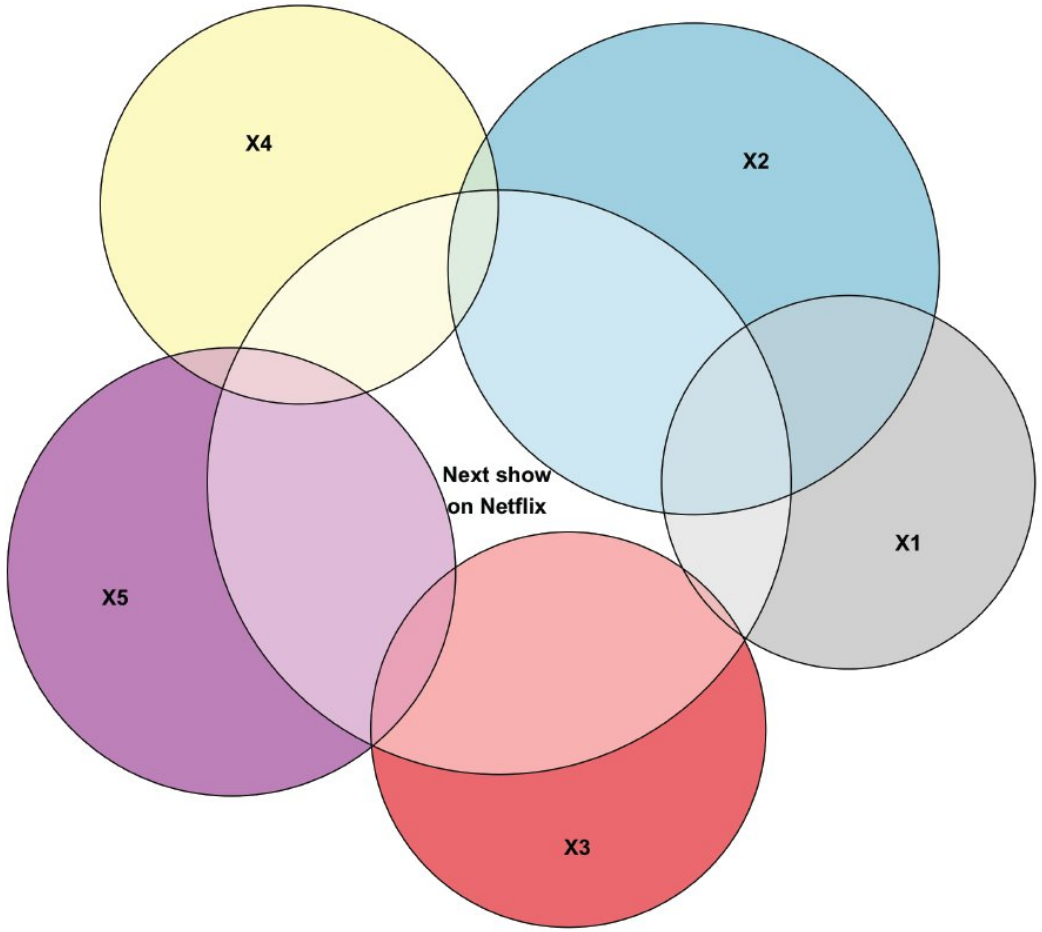
Circles sized according to each variable's sum of squares; size of overlapping areas is not 100% correct due to limitations in available geometric space


X4
X2
Next show
on Netflix
X1
X5
X3


Poverty
Program

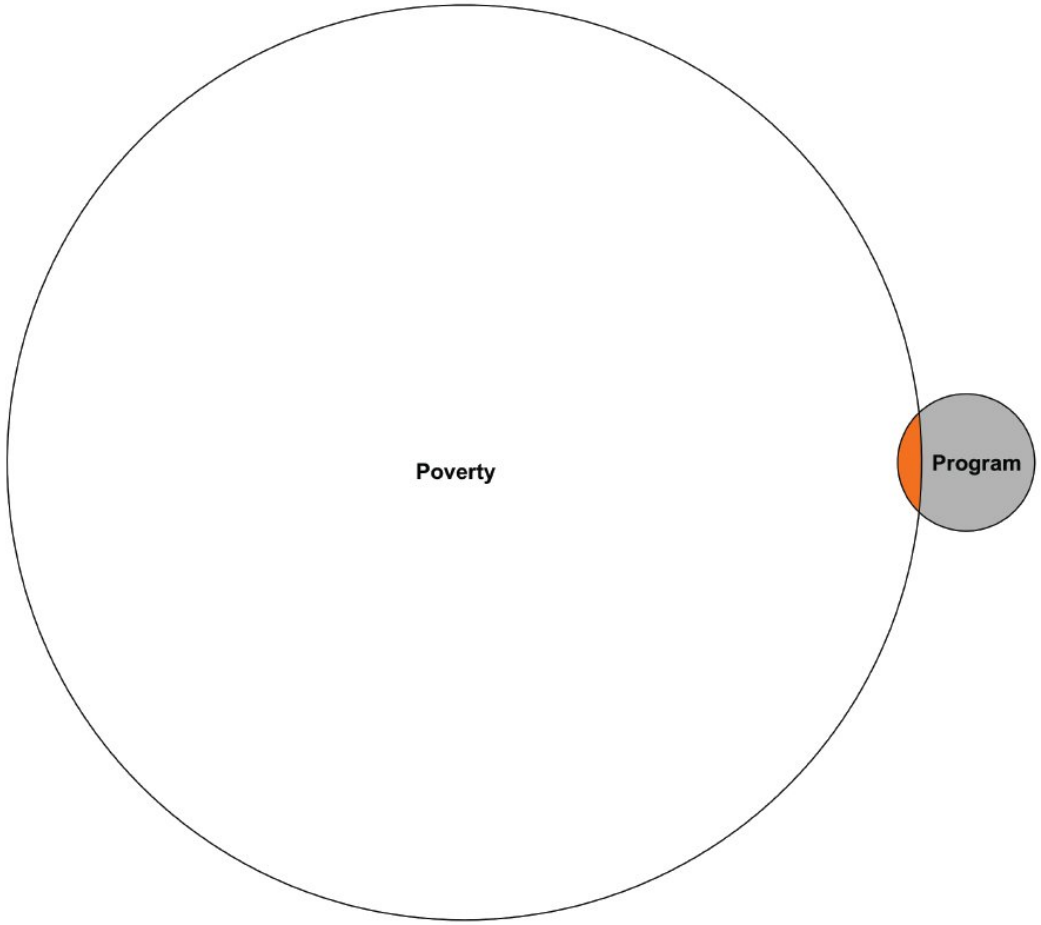
Regression focused on prediction

Focus is on Y
Minimize unexplained variation in the outcome



Regression focused on estimation

Focus is on a single X
Get that little sliver as accurate as possible



Measuring outcomes

Outcomes and programs

Outcome variable

Thing you're measuring

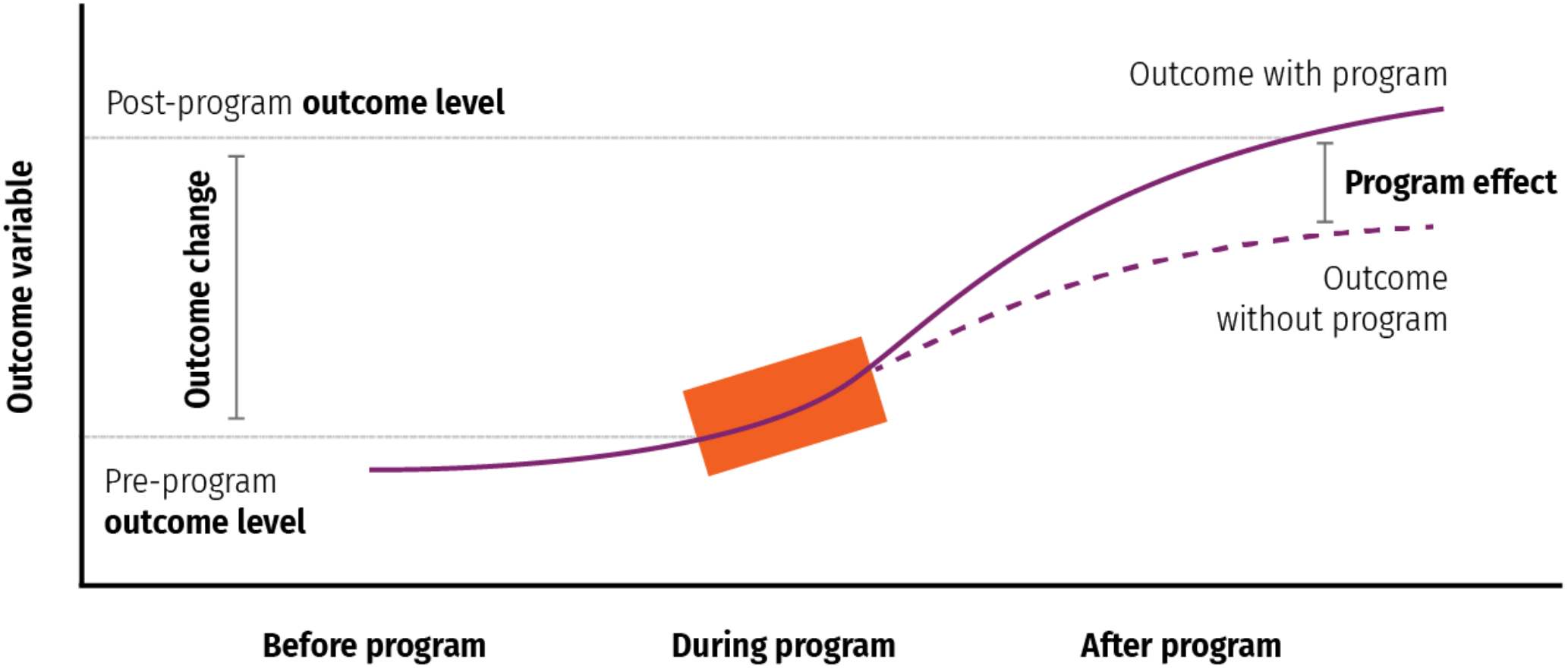
Outcome change

Δ in thing you're measuring over time

Program effect

Δ in thing you're measuring over time *because of* the program

Outcomes and programs



Abstraction