In-person session 3

January 26, 2023

PMAP 8521: Program evaluation
Andrew Young School of Policy Studies

Plan for today

Logic models

R FAQs

Regression FAQs

Transforming data with dplyr

Regression with R

Logic models

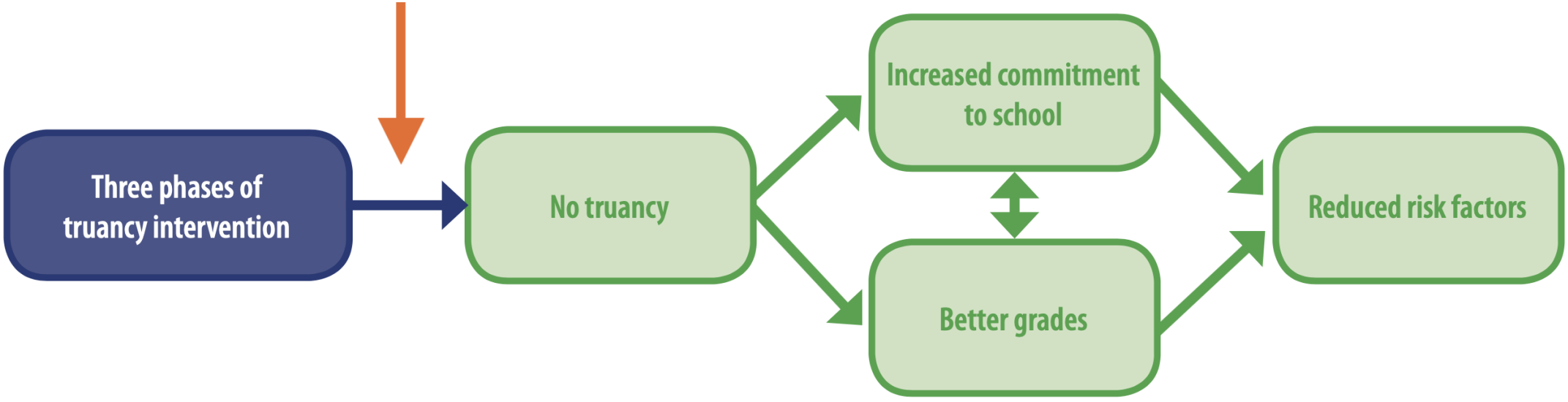
Logic models as managerial tools

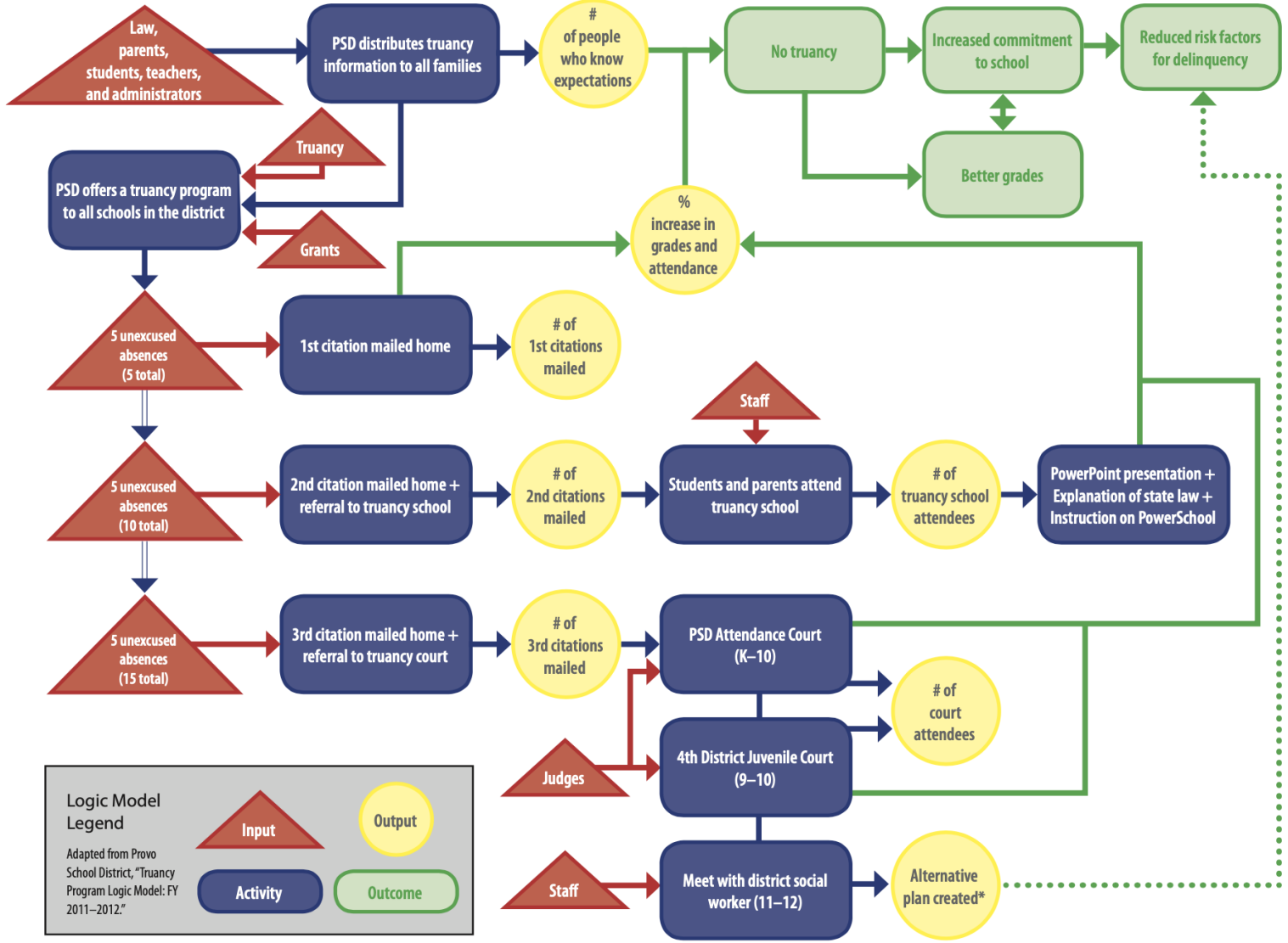
Inputs vs. Activities vs. Outputs vs. Outcomes

Impact theory vs. logic model

Impact theory

Ensure that the theory linking activities to the outcomes is sound!





* Because 11th and 12th graders who receive 3rd citations are generally unable to graduate from high school, district social workers no longer attempt to increase their commitment to school. As such, any outcomes that occur as a result of the alternative plans made for these students (work study programs, career development assistance, etc.) are only tangentially related to the outcomes of the truancy program itself. The system for creating alternative plans is an entirely separate program with its own logic model, goals, and outcomes.

MPA/MPP at GSU

Master of Public Policy

Preparing students for roles as effective citizens and workers in the public sphere.

About | Curriculum | Admissions | MPA vs. MPP | Current Students

The Master of Public Policy (MPP) is an interdisciplinary degree program designed to prepare students for work in the analysis, development, and evaluation of public policies. In all levels of government and on a global scale, public needs and limited resources require public policy choices that are at once economically efficient, socially and technically effective, and politically responsive. Such choices confront policymakers in a broad range of critical issues, including health, education, economic development, public finance, social policy, nonprofit policy, and disaster policy.

Decision-makers often lack the knowledge and skills needed to interpret the full social, political, economic, and technical dimensions of the policy issues they face. In response, state and local governments, businesses, and federal agencies have turned to trained policy analysts for assistance in assessing policy options and in evaluating public programs. The same is true for nonprofit agencies, such as hospitals, schools, emergency preparedness and relief agencies, and regional planning organizations.

Master of Public Administration

A flexible program for working professionals and full-time scholars.

About | Curriculum | Careers | Admissions | MPA vs. MPP

The mission of the Master of Public Administration (MPA) program is to prepare students to become leaders in public service careers as executives, managers, analysts, and policy specialists in government and nonprofit organizations.

Isn't it best to always have an articulated theory?

Should implicit theory and articulated theory be the same thing in most cases?

How much does this evaluation stuff cost?

Can you do scaled-down versions of these evaluations?

What if a program exists already and doesn't have a logic model?

Why would a program aim for final outcomes that can't be measured?

What should you do if you find that your theory of change (or logic model in general) is wrong in the middle of the program? Is it ethical to stop or readjust?

R FAQs

Main goals with R

Manipulate data

Plot data

Analyze data with regression models

How to find R help online

RStudio Community

Stack Overflow

Google ("rstats")

Twitter/Mastodon (#rstats)

ChatGPT (overconfident glorified autocomplete)

What the heck is a tibble?

RStudio fun

File paths, working directories, and RStudio projects

The hyperliterality of computers

R Markdown fun

Side-by-side regression tables

	Model 1	Model 2	Model 3	Model 4
(Intercept)	362.307	−5780.831***	−5736.897***	−5433.534***
	(283.345)	(305.815)	(307.959)	(286.558)
bill_length_mm	87.415***		6.047	−5.201
	(6.402)		(5.180)	(4.860)
flipper_length_mm		49.686***	48.145***	48.209***
		(1.518)	(2.011)	(1.841)
sexmale				358.631***
				(41.572)
Num.Obs.	342	342	342	333
R2	0.354	0.759	0.760	0.807
R2 Adj.	0.352	0.758	0.759	0.805
AIC	5400.0	5062.9	5063.5	4863.3
BIC	5411.5	5074.4	5078.8	4882.4
Log.Lik.	−2696.987	−2528.427	−2527.741	−2426.664
F	186.443	1070.745	536.626	457.118
RMSE	643.54	393.12	392.34	353.66
+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001				

	Model 1	Model 2	Model 3	Model 4
(Intercept)	362.307	−5780.831***	−5736.897***	−5433.534***
	(283.345)	(305.815)	(307.959)	(286.558)
bill_length_mm	87.415***		6.047	−5.201
	(6.402)		(5.180)	(4.860)
flipper_length_mm		49.686***	48.145***	48.209***
		(1.518)	(2.011)	(1.841)
sexmale				358.631***
				(41.572)
Num.Obs.	342	342	342	333
R2	0.354	0.759	0.760	0.807

See full documentation and examples for `modelsummary()` here

Make nicer tables when knitting with `kable()`

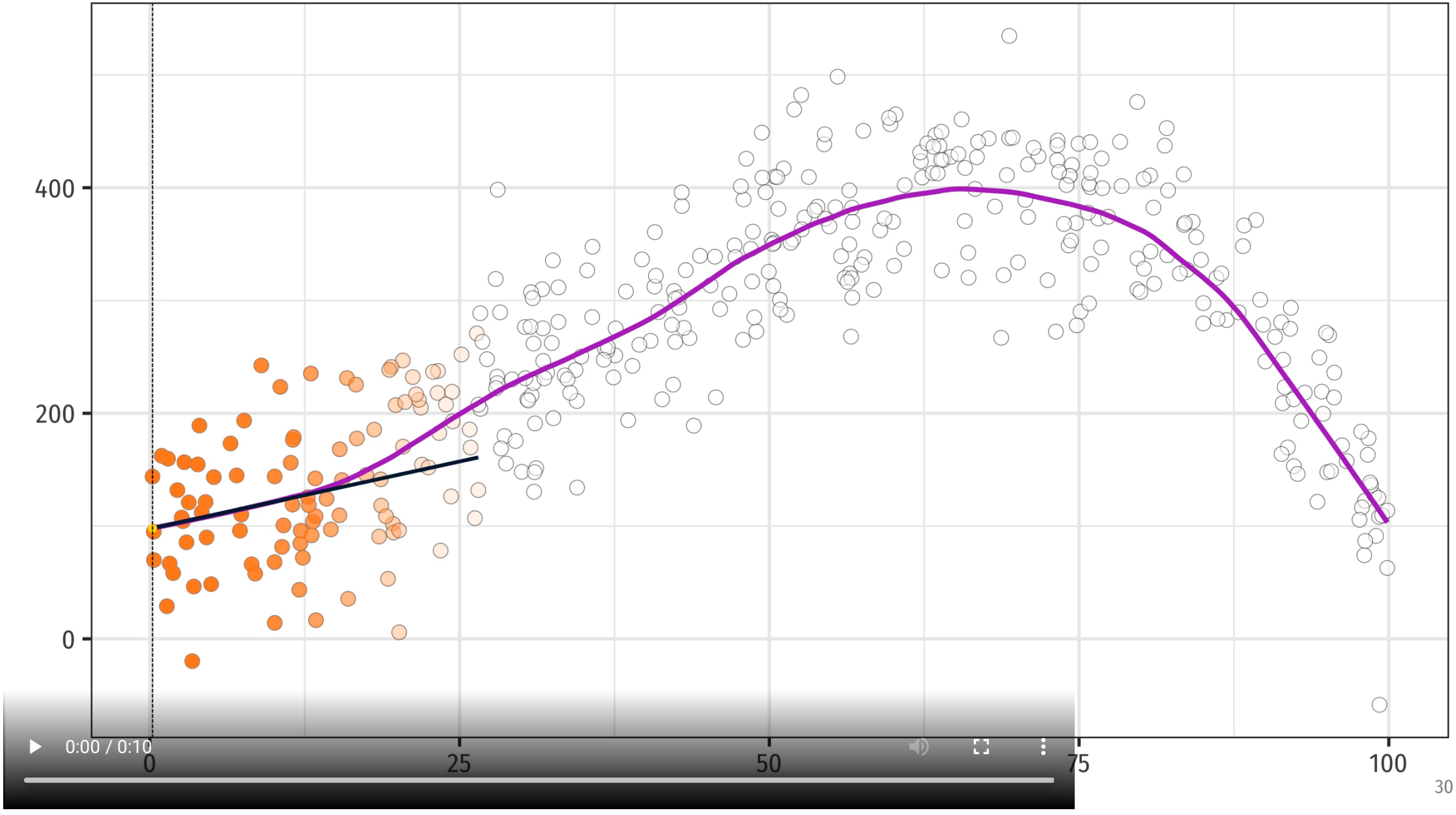
(Or even fancier tables with **kableExtra**!)

Regression FAQs

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

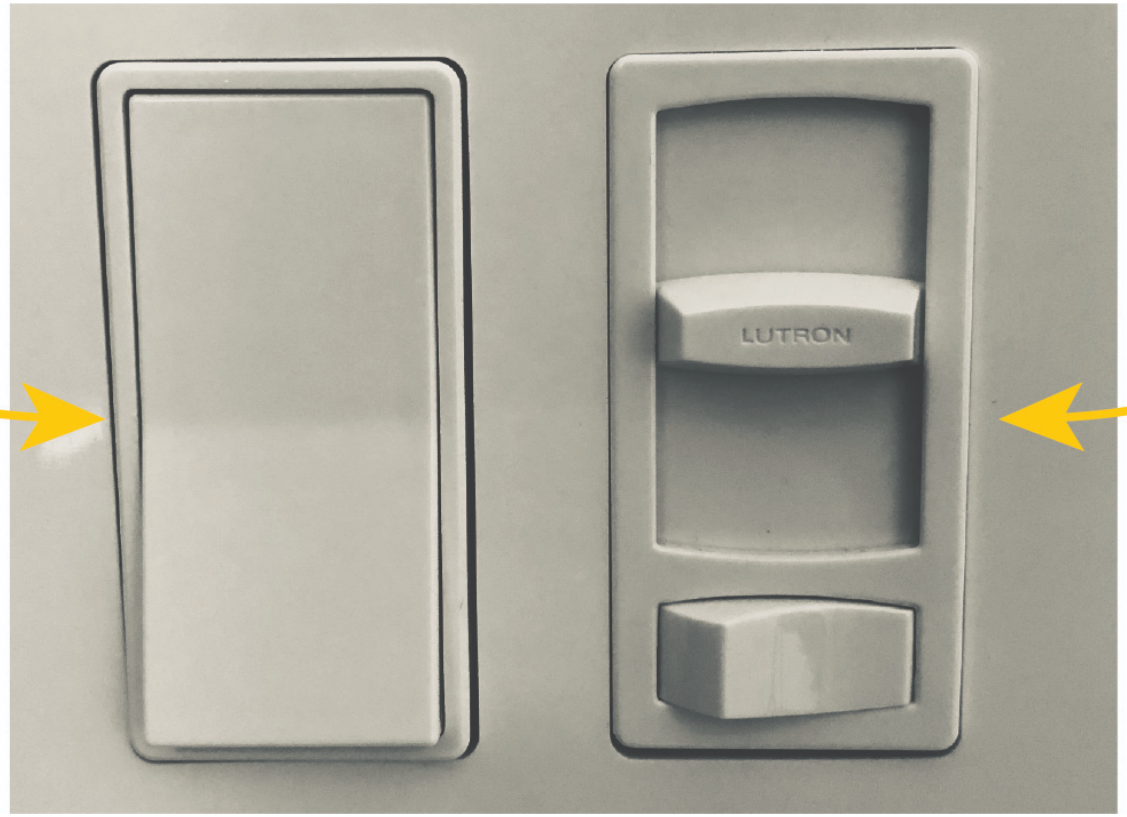
Regression equations

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?

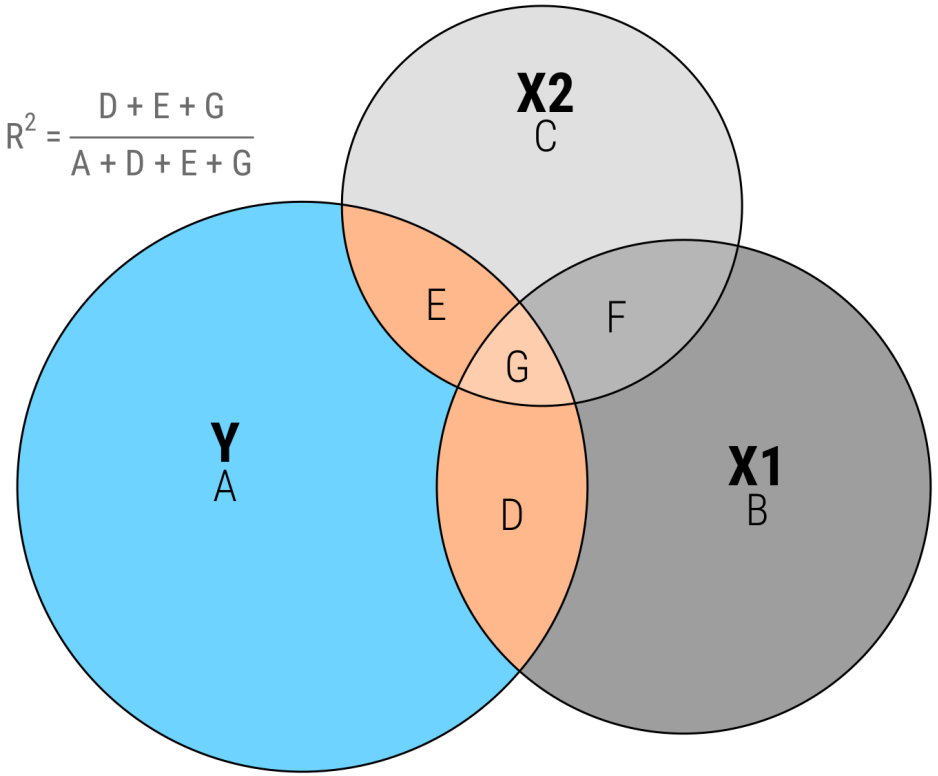
How does significance relate to causation?

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

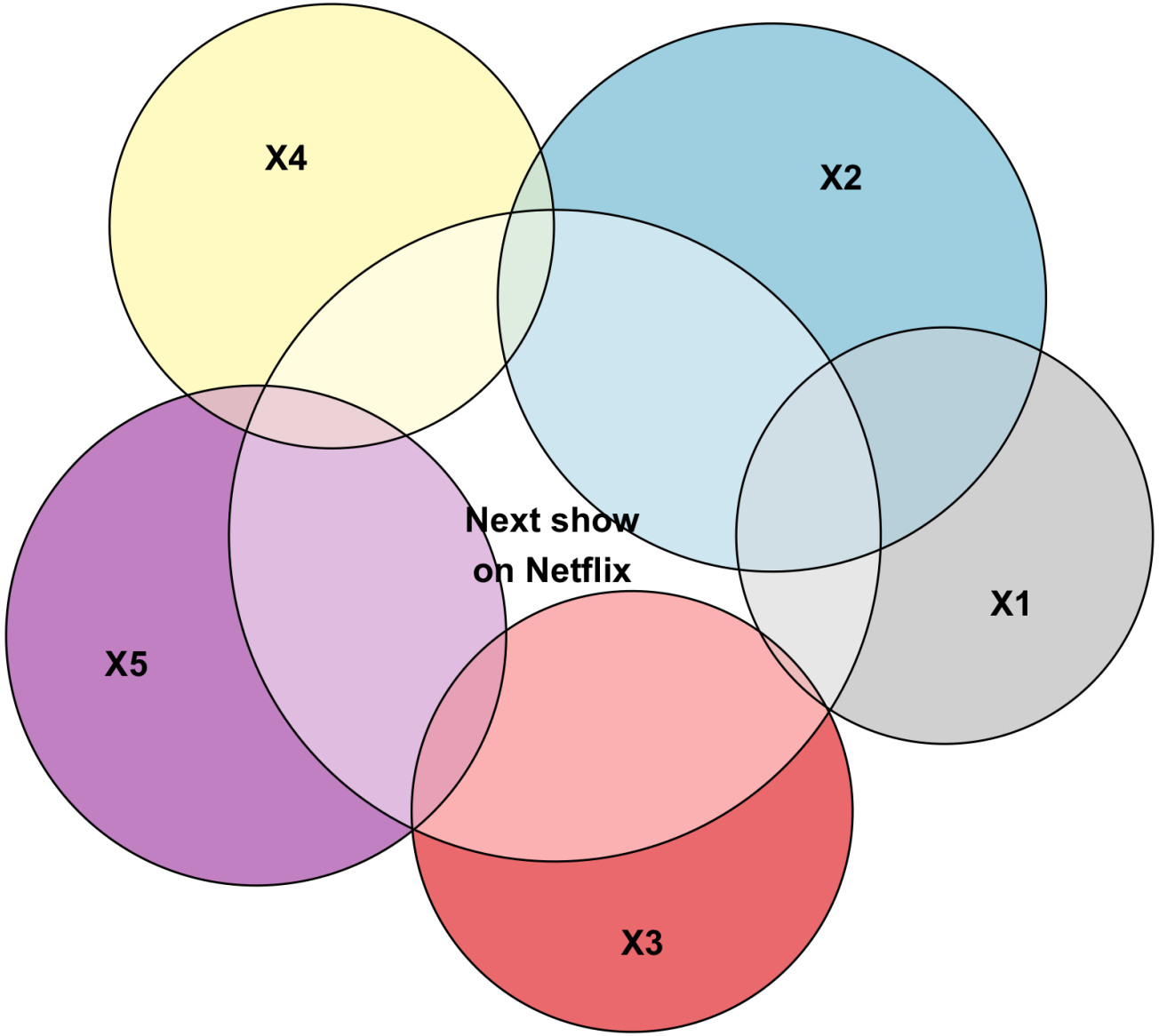
What counts as a "good" R^2?

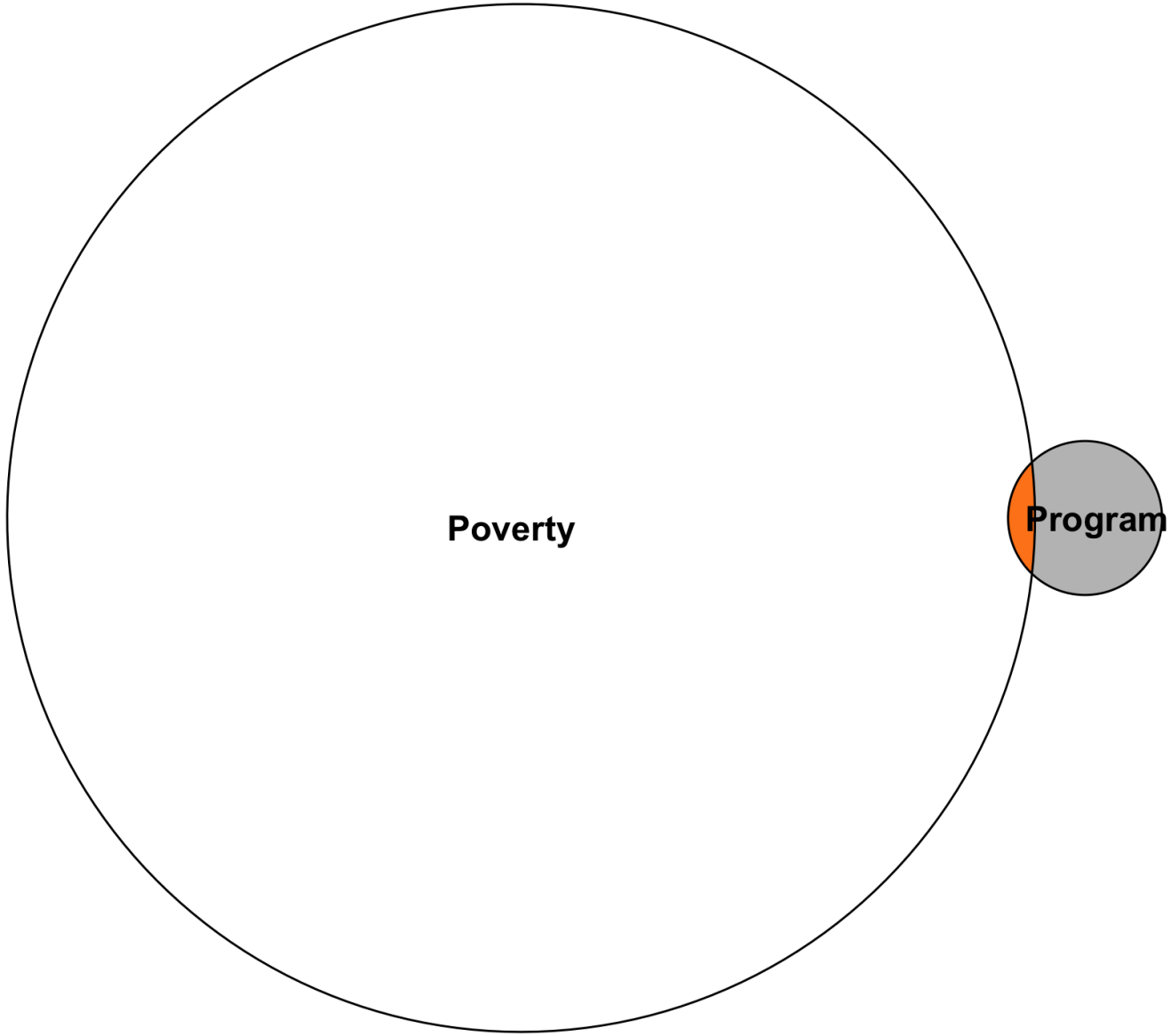
R^2 represented as an Euler diagram

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



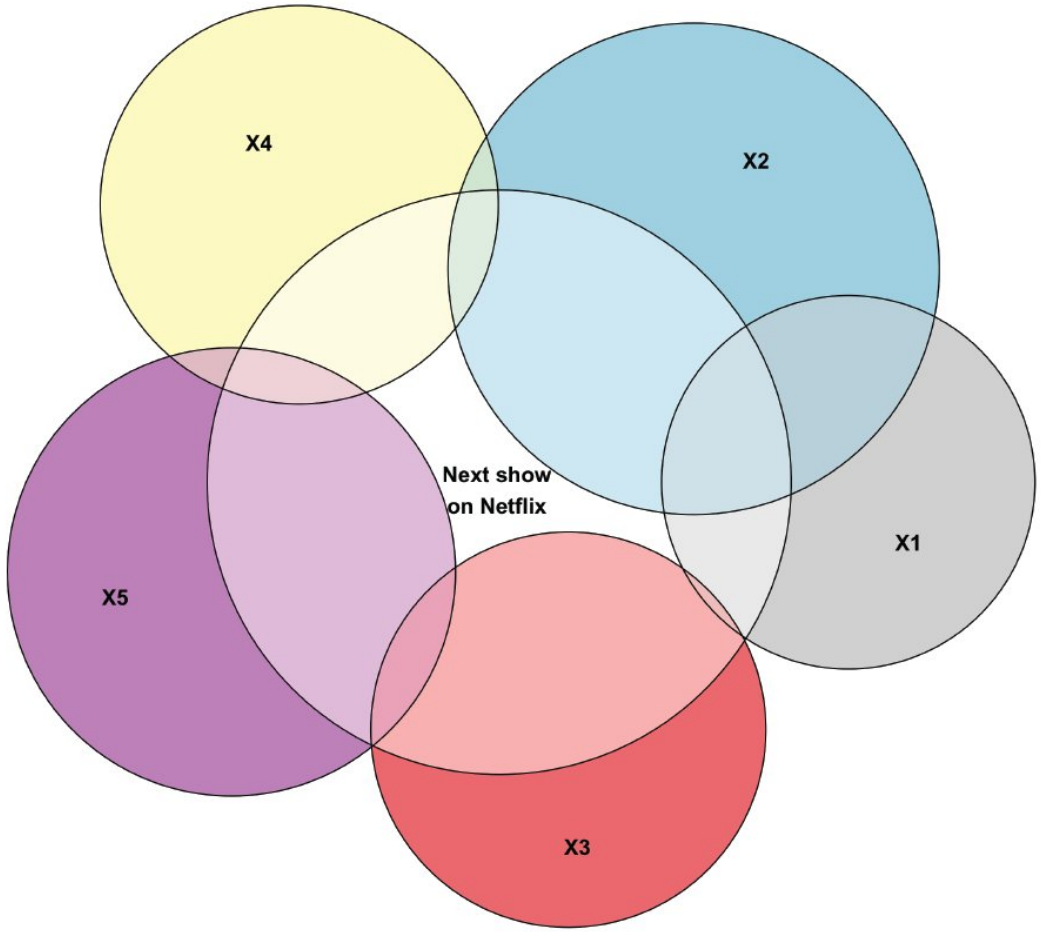
Circles sized according to each variable's sum of squares; size of overlapping areas is not 100% correct due to limitations in available geometric space


X4
X2
Next show
on Netflix
X1
X5
X3


Poverty
Program

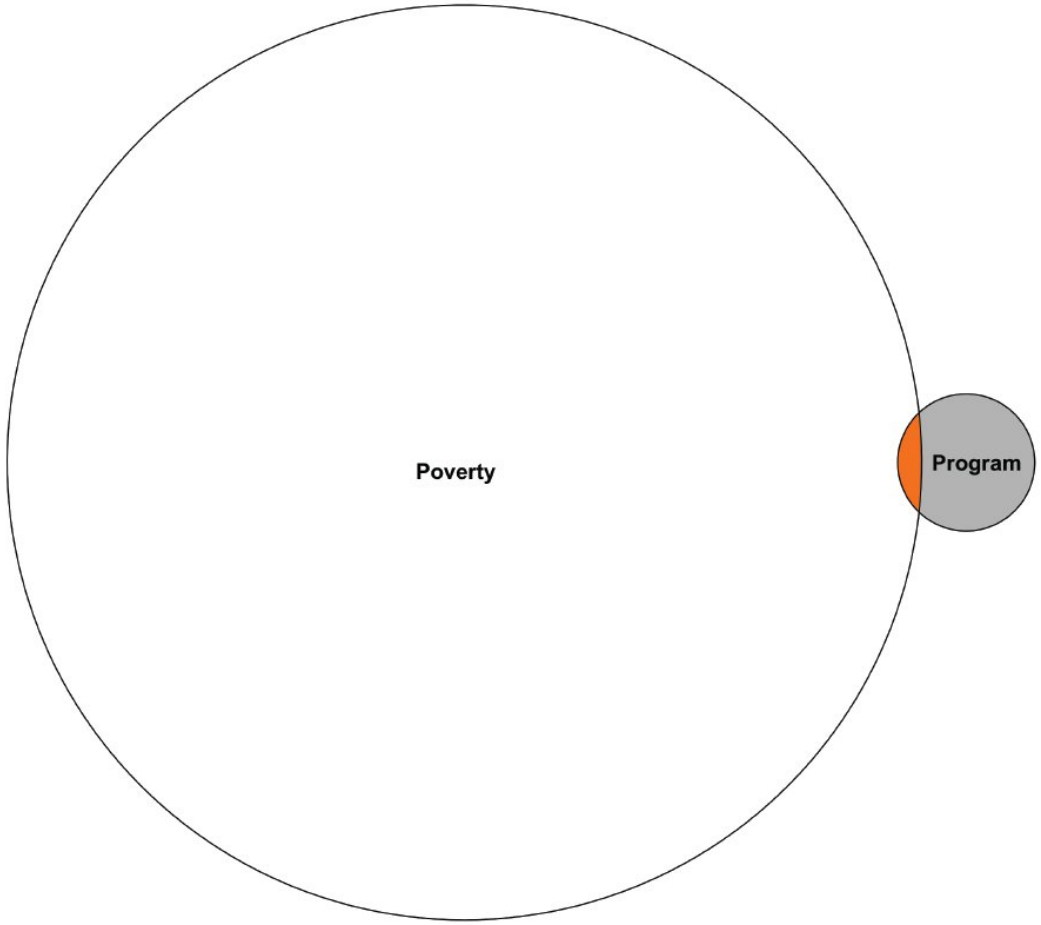
Regression focused on prediction

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



Transforming data with dplyr

Regression with R