

# In-person session 3

**January 25, 2024**

PMAP 8521: Program evaluation  
Andrew Young School of Policy Studies

# Plan for today

**Logic models**

**Regression FAQs**

**Regression with R**

# Logic models

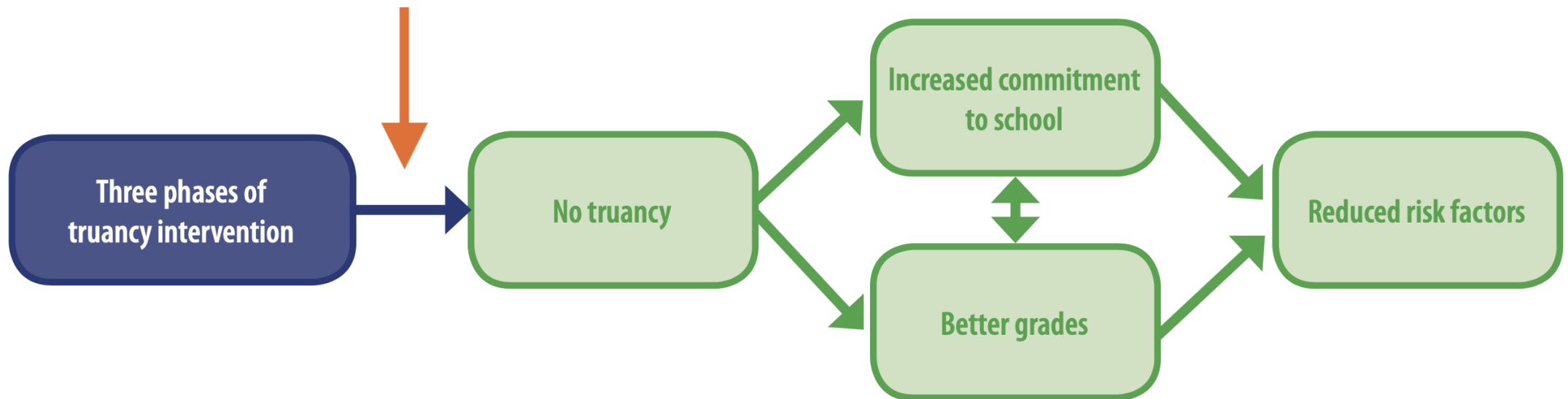
# Logic models as managerial tools

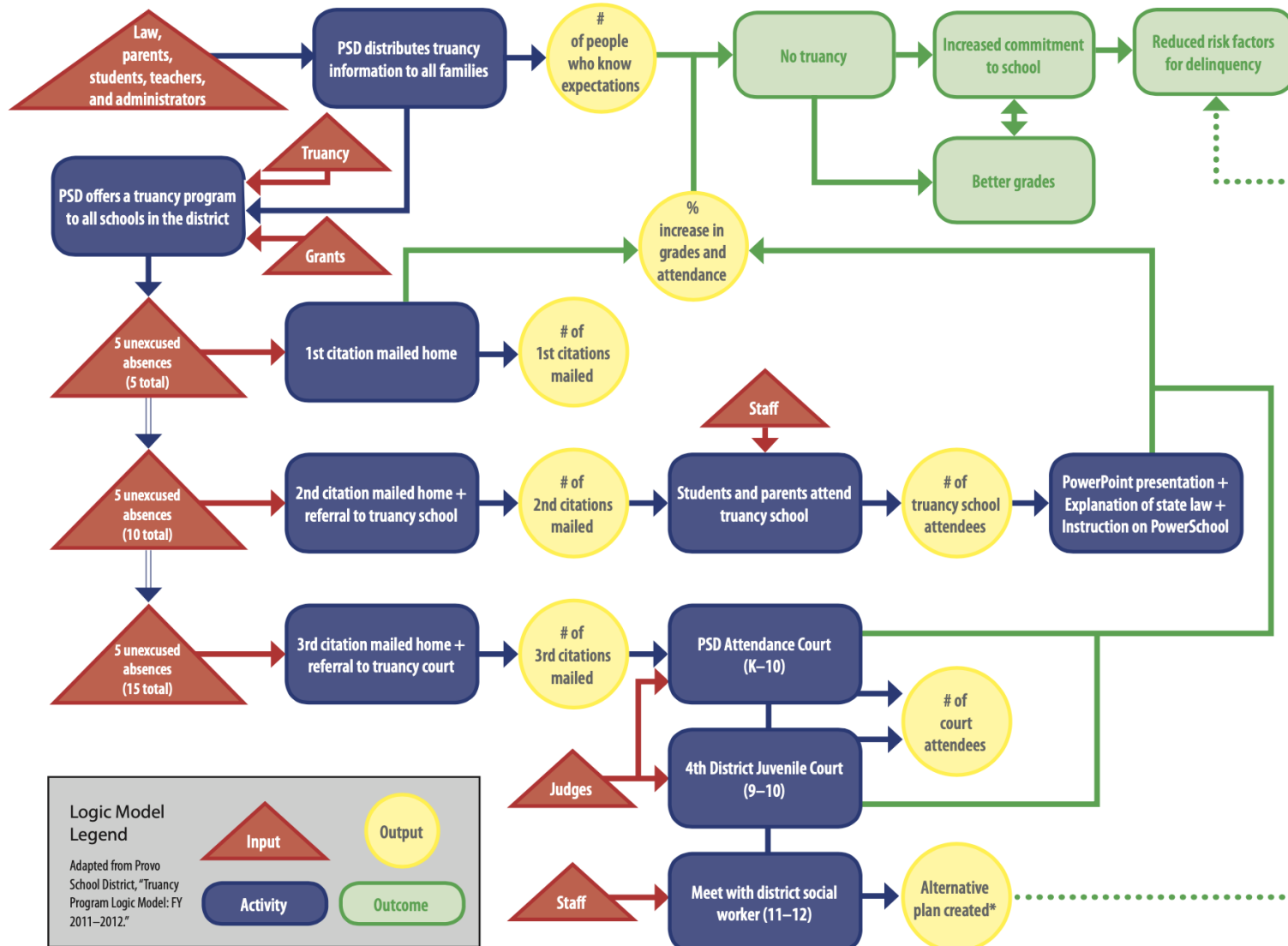
# **Inputs vs. Activities vs. Outputs vs. Outcomes**

# Impact theory vs. logic model

# Impact theory

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





**Logic Model Legend**

Adapted from Provo School District, "Truancy Program Logic Model: FY 2011-2012."

**Input** (Red Triangle)

**Output** (Yellow Circle)

**Activity** (Blue Rounded Rectangle)

**Outcome** (Green Rounded Rectangle)

\* 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.

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*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.

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*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?**

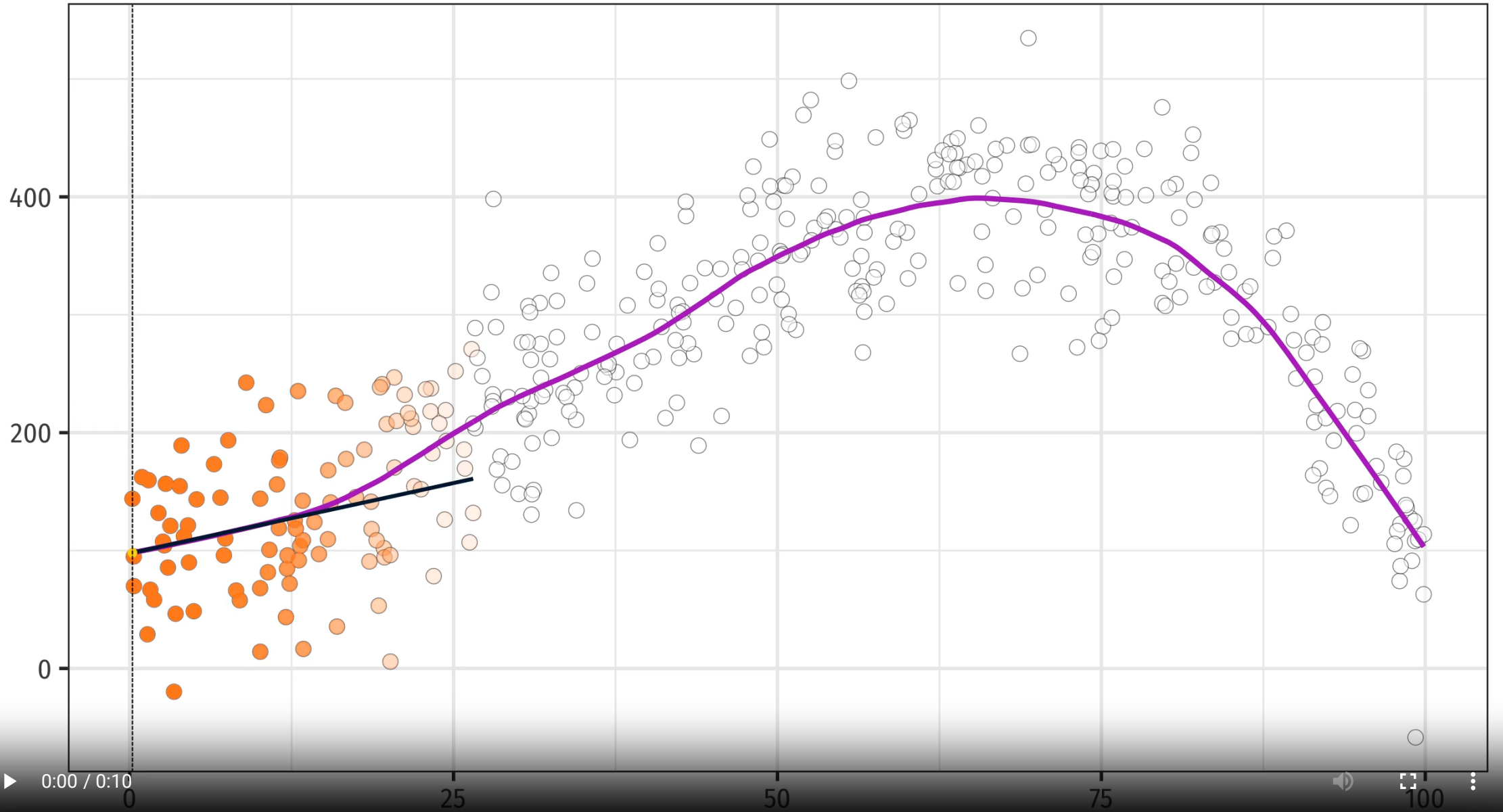
# Regression FAQs

# Drawing lines through points

<https://evalsp24.classes.andrewheiss.com/slides/02-slides.html#17>

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





▶ 0:00 / 0:10

🔊 🔍 ⋮

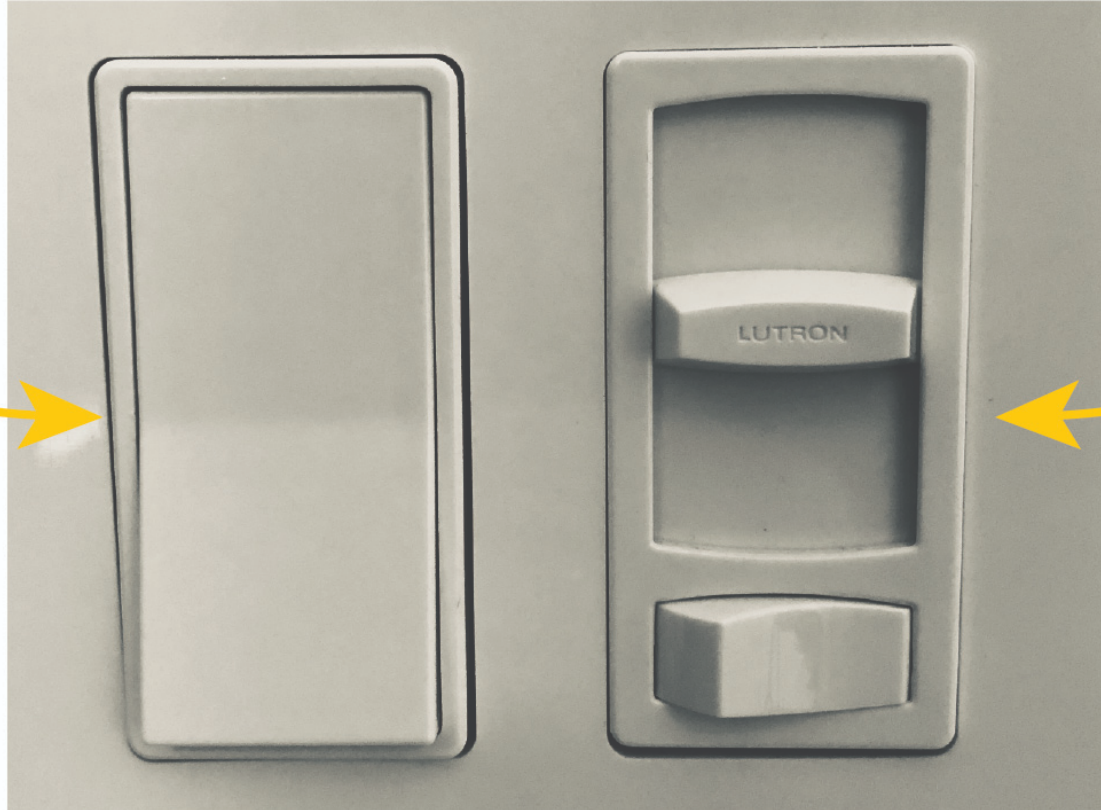
# Regression equations

**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?**





## 5-Minute Healthy Oatmeal

Fit Foodie Finds

4.6 ★★★★★ (93)

10 min



## Basic Oatmeal Recipe

Del's cooking twist

5.0 ★★★★★ (1)

15 min



FeelGoodFoodie

<https://feelgoodfoodie.net> › [recipe](#) › [how-to-make-oat...](#) ⋮

## How to Make Oatmeal

Jan 17, 2019 — Microwave Instructions. Place the **oats**, water and salt in a microwave safe bowl. Heat in the microwave on high for 90 seconds. · Stovetop ...

★★★★★ Rating: 5 · 8,192 votes · 4 min

[Microwave Cooking...](#) · [Stovetop Cooking...](#) · [Healthy Oatmeal Recipes](#)



Downshiftology

<https://downshiftology.com> › ... › [Courses](#) › [Breakfast](#) ⋮

## Easy Oatmeal Recipe

Sep 11, 2023 — Learn how to make **oatmeal** that's hearty and creamy. It's easy to make on the stove or in the microwave - and it's healthy too!

★★★★★ Rating: 5 · 21 votes · 7 min

[Popular Types Of Oatmeal](#) · [How To Make Oatmeal Like A...](#) · [Make Your Oatmeal Taste...](#)



# 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?**

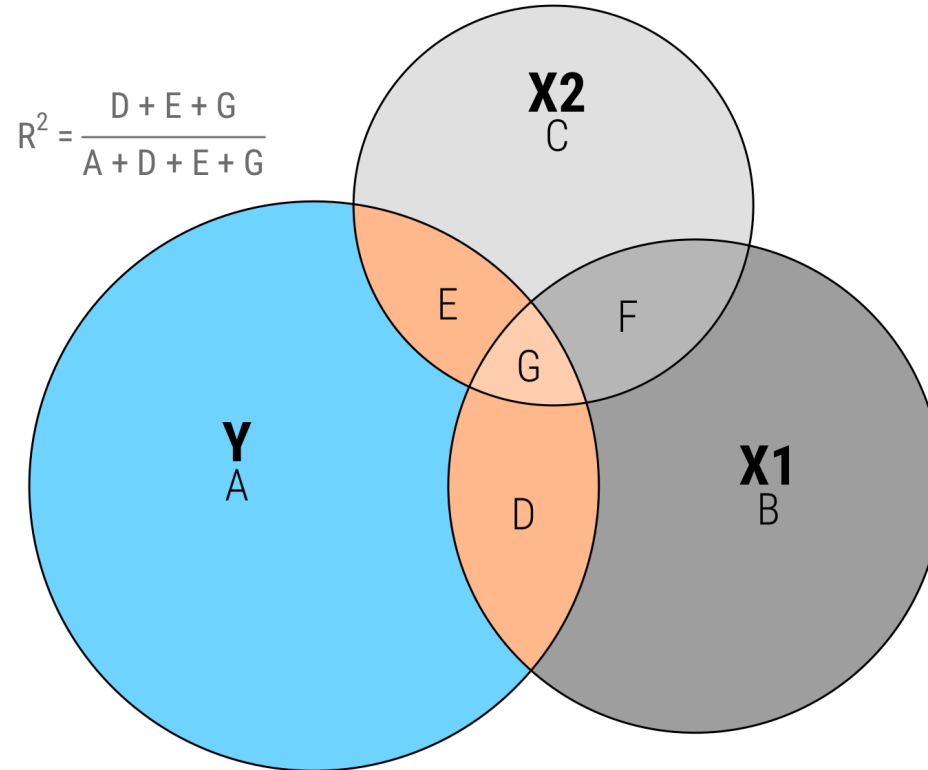
**How does significance relate to causation?**

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

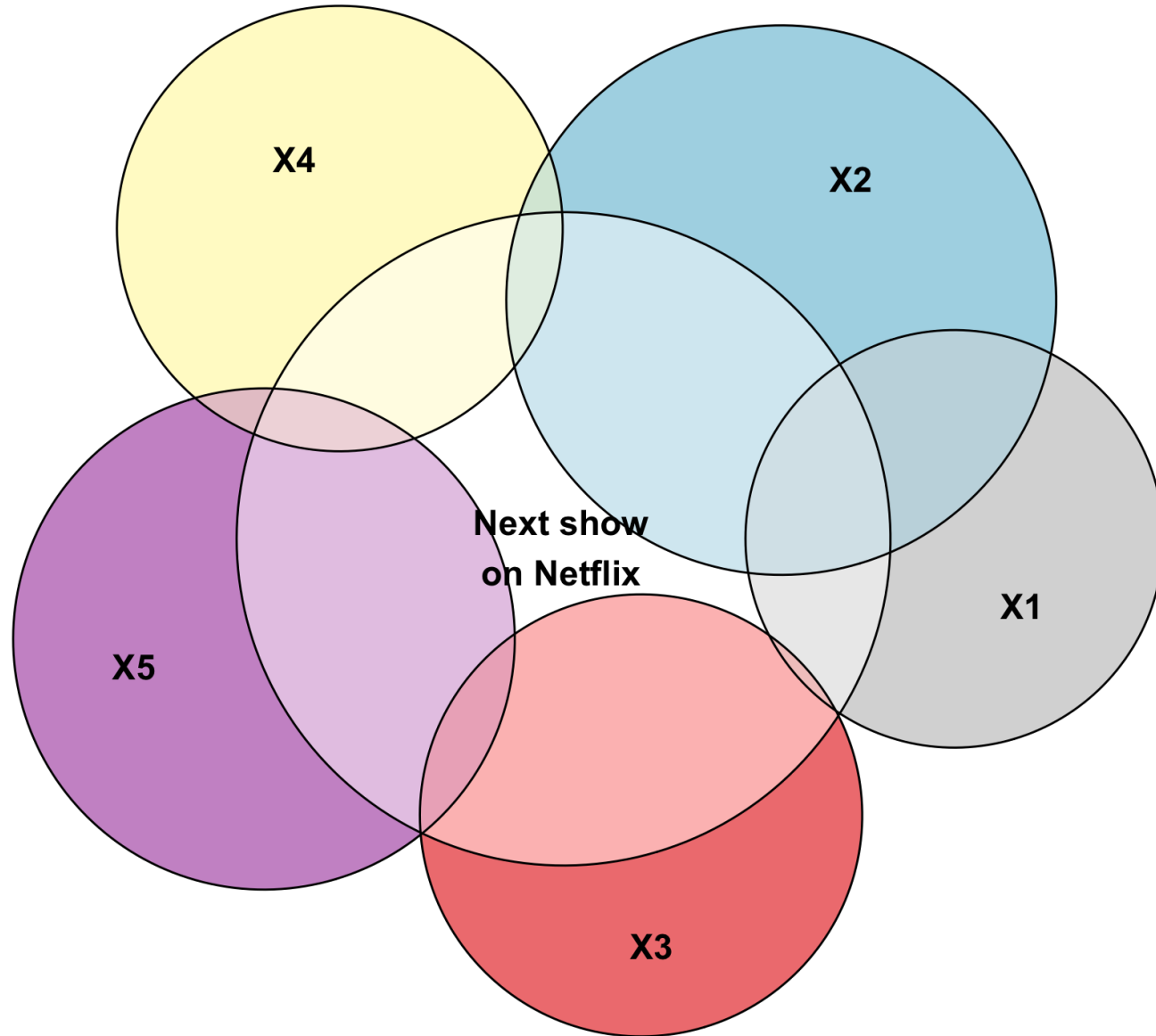
**What counts as a "good"  $R^2$ ?**

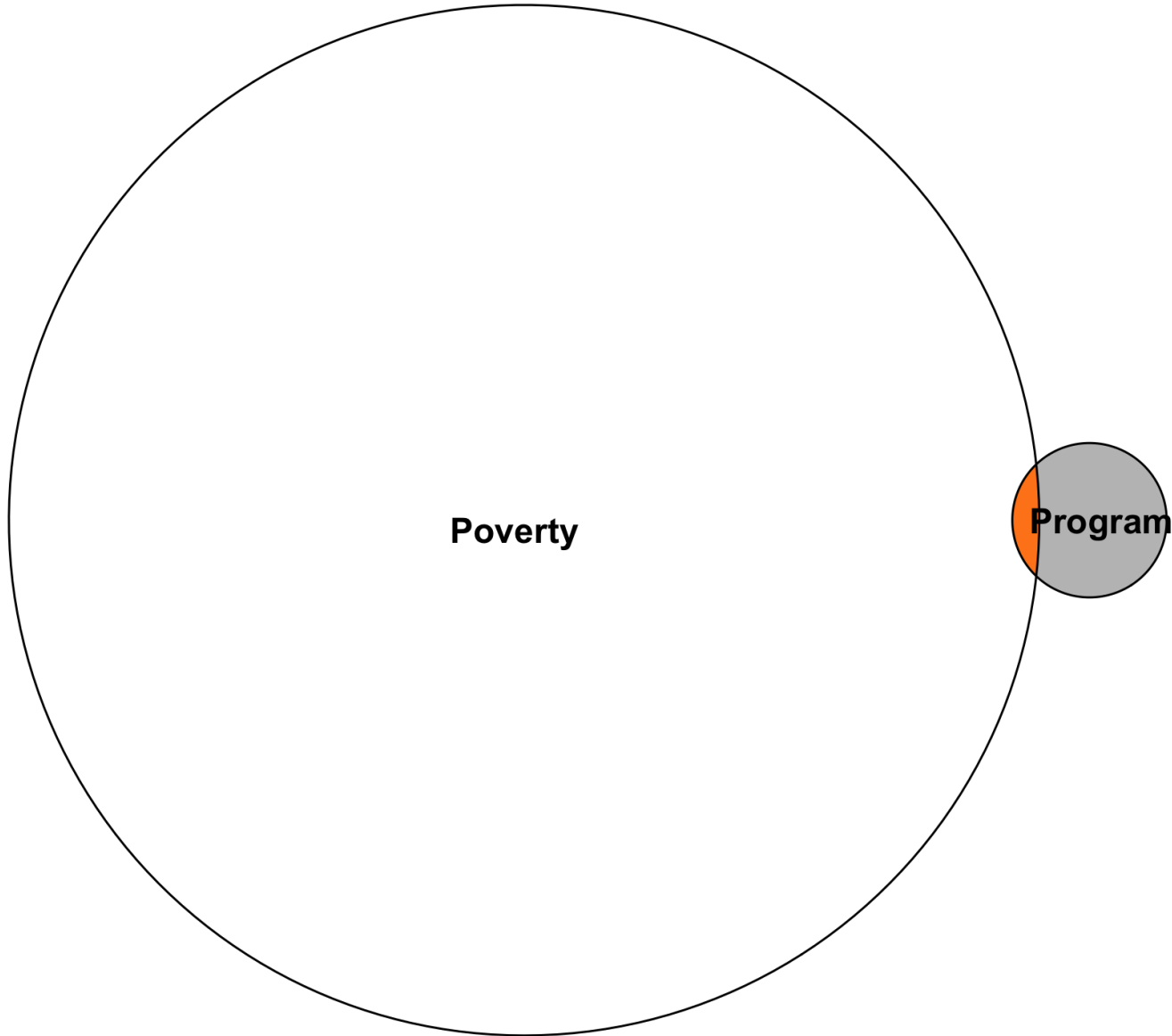
## R<sup>2</sup> represented as an Euler diagram

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

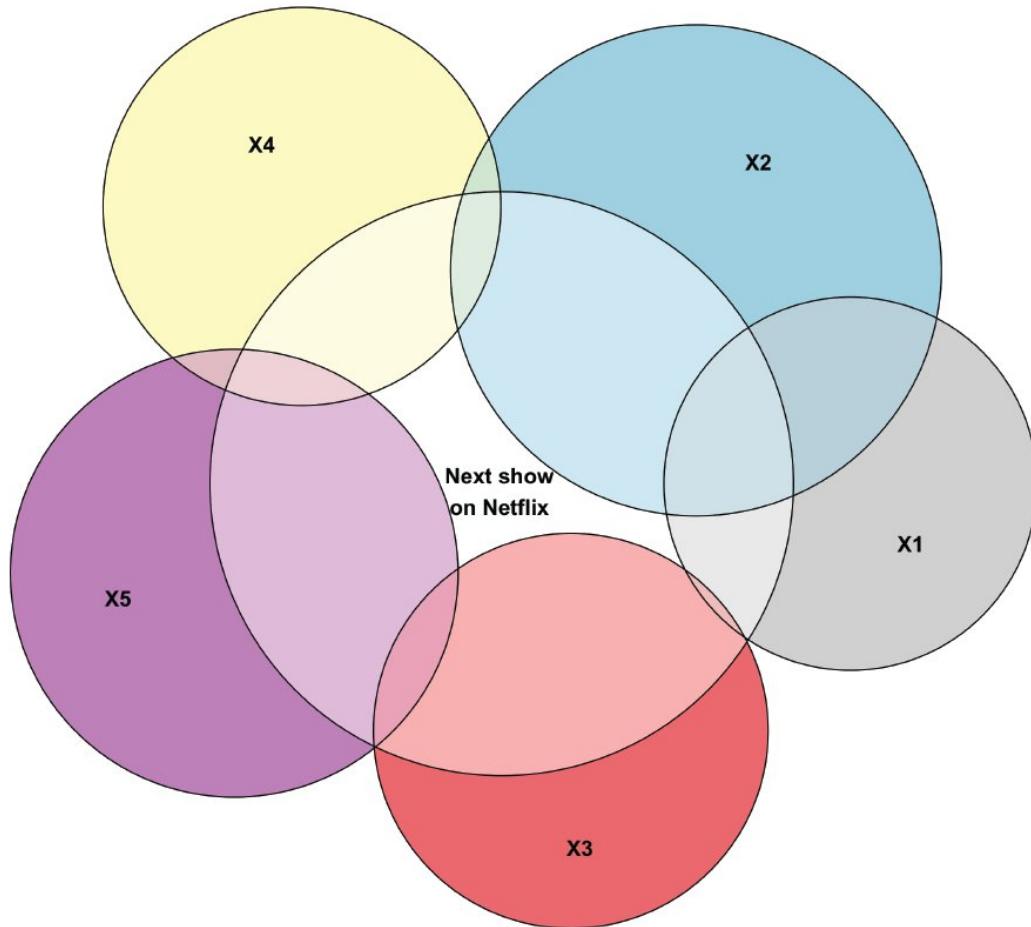






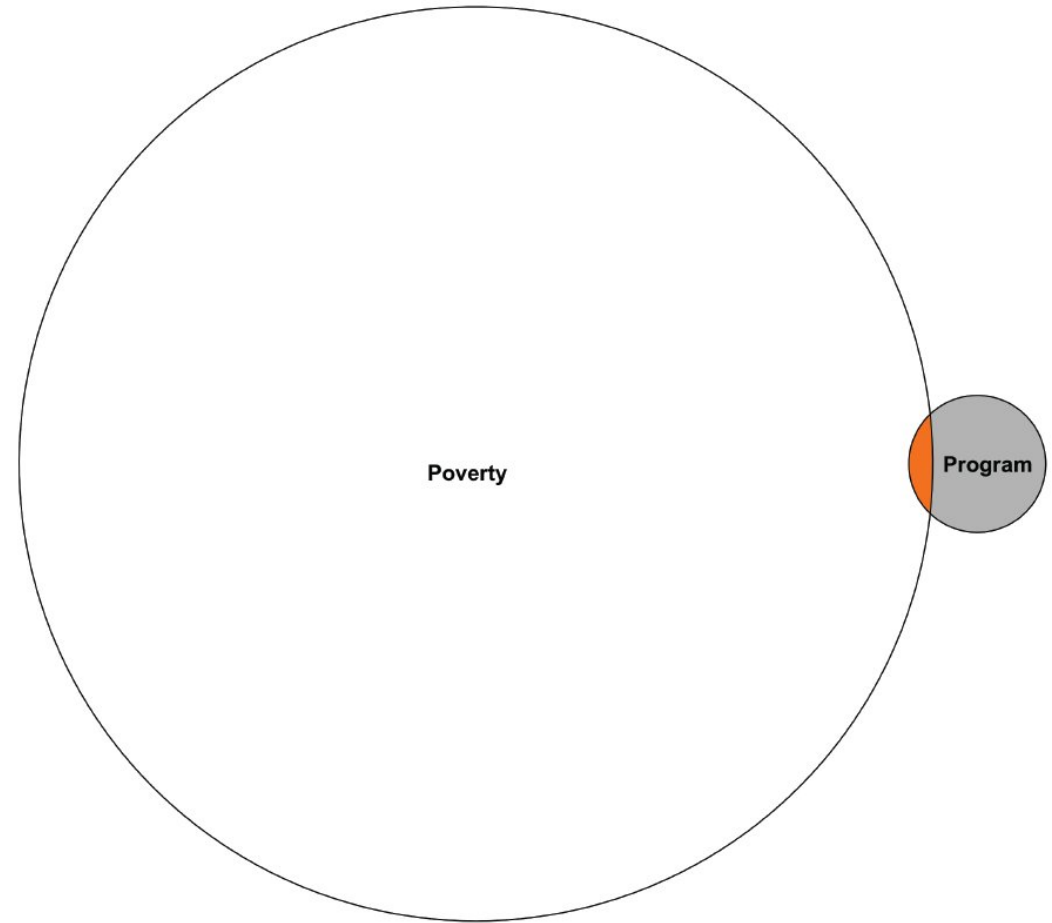
## Regression focused on prediction

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



# Side-by-side regression tables

	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
(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

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See full documentation and  
examples for `modelsummary()` [here](#)

**Make nicer tables with `{gt}`**

# Regression with R