Models

Kinds of research

- Experimental (we introduce an intervention and look at the effects; researcher introduced assignment)
- Observational (we measure/survey our participants without trying to affect them; no researcher-introduced assignment)

Typically we pair some kinds of statistical tests with experimental work and other kinds of tests with observational work.

Kinds of research

In reality, most statistical tests can be used with most kinds of research. It's not so much the kind of research that matters, but **which statistic helps to answer your question** and **what types of variables do you have?**

- We'll discuss the first point throughout the course

What is a model?

not mathematical

What is a model?

- a representation of the world
- a **statistical** model uses math to make predictions about the world

YOU DEFINE THE MODEL

Middle School Math

$$y = mx + b$$

- what is y?
- what is m?
- what is x?
- what is b?

Let's rewrite this

$$y = b_0 + b_1 X$$

- what is y?
- what is b_0?
- what is b_1?
- what is X?

Are models always right?

MODELS ARE FLAWED

- How?

How do we compensate?

$$y = b_0 + b_1 X + e$$

What are the goals of modeling?

What do you need in order to develop a model?

How do we know if a model is good? What makes it good?

How will we use models?

- This semester, we will mainly focus on classic statistical tests
- Every single one of these is a model
- We will also focus on developing your intuition
- When you face new models, come back to these basics