One Factor Designs

Recall

Agenda

Steps of a Hypothesis Test

1) Choose an alpha-level (α) / decision boundary.
   - ↳ $0 \leq \alpha \leq 1$
   - ↳ $\alpha \geq P_{H_0}(\text{Reject } H_0)$ ← Type I error
2) Define a random data generating process.
3) Determine meaningful null hypothesis, H_0, and alt., H_A.
4) Determine a test statistic, T (which is a RV).
5) Derive/approximate distribution of T.
6) Decide whether or not to reject null, H_0.

One Factor Design

What if there are more than two treatments that we want to compare?

def Factor:

def Level:

Ex

STUDY

Babies Walking

Research Question: What effect does a training program have on the age at which babies first walk?

Design:

STUDY Babies Walking

Research Question: What effect does a training program have on the age at which babies first walk?

Design: Researchers recruited 20 babies and assigned them to groups of size 5 completely at random

1) Special walking exercises
2) Regular exercise
3) No exercize but weekly follow-up.
4) No exercize and no follow-up.

A) Treatments?
B) Units?
C) Assignment?
D) Response?

E) How many potential outcomes?

F) Possible parametric model for Y_i?

Estimands and Estimators (and Test Statistics)

What parameters could we estimate here?