

**Power Analysis**

Recall

	H <sub>0</sub> True	H <sub>0</sub> False
accept H <sub>0</sub>		
reject H <sub>0</sub>		

Factors affecting power

1. α level      2. effect size    3. sample size      4. type of statistics

Post Hoc Power Analysis

t-test

ANOVA

$$d = \frac{\mu_1 - \mu_2}{\sigma}$$

$$f = \frac{\sqrt{SSb / N}}{\sigma}$$

$$\hat{d} = t \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}$$

$$\hat{f} = \sqrt{(k - 1) \frac{F}{N}}$$

$\hat{d}$

$\hat{f}$

Around .20 --- small  
 .50 --- medium  
 >.80 --- large

Around .10 --- small  
 .25 --- medium  
 > .40 --- large

How much power do we need?

Want to have 70 or 80% chance (i.e., power = .70 or .80) of finding a difference if one is there.

non sig. F --- small effect size --- \_\_\_\_\_  
 --- large or med. effect size --- \_\_\_\_\_

A Priori Estimation of Power (How many subjects?)

Need to know  $\alpha$  and effect size. Then look up Power Tables.

Improving Power

1. lenient  $\alpha$  2. one-tailed test 3. reduce MSw 4. link between TRT and DV

Weigh Power vs. Type I error.

