

### Empirical Power (how much you had)

$$\phi = \phi' \sqrt{n}$$

$$\phi' = \sqrt{(SS_{\text{between}}/N)/MS_{\text{within}}} \quad \text{or} \quad [(SS_{\text{between}}/N)/MS_{\text{within}}]^5$$

$$\phi = [\sqrt{(SS_{\text{between}}/N)/MS_{\text{within}}}] \sqrt{n}$$

From 7/3/03 ANOVA

Source	SS	df	MS	F
Total	16	6-1		
Between	6	2-1	6	
Within	10	6-2	2.5	

$$\phi = [\sqrt{(6/6)/2.5}] \sqrt{3} = .63245\sqrt{3} = 1.095$$

1.095 is close to 1 on the p740 power table for df =4 in the denominator, so Beta is about .80 and power is about 20%

**What sample size, with this effect, would give 80% to 90% power?**

$$\phi^2 / \phi'^2 = n$$

$$\phi^2 / .63^2 = n$$

Go to df denominator =  $\infty$  and find Beta closest to .20... it is 2

$$2^2 / .63^2 = n = 10.078$$

So, about 10 subjects in each of the two cells would give 80% for this effect size