

Power Assessment

Logic: Simulate data
incorporating the expected
"effect", then see if
planned statistical analysis
can resolve that effect
(show "significant" effect).

Simulating data with the
expected effect:

theoretical model of how
the data actually arise,

* Regression example

$$F_i = \alpha D_i + \beta C_i + \mu + \varepsilon_i$$

common to report σ_ε

"Run" the regression model
to simulate data:

$$F_i = \alpha D_i + \beta C_i + \sigma + \sigma_i$$

Inputs (known) α, β are "hypothesis"
 D, C are design

Need

mean of σ

std of σ

Normally distributed

Just crank these inputs through the
equation to calculate F_i

"Power" is reported in terms of:

- * effect size we are looking for
- * significance level for drawing a conclusion

* frequency with which this process comes to the wrong conclusion

this requires replication of the simulation.