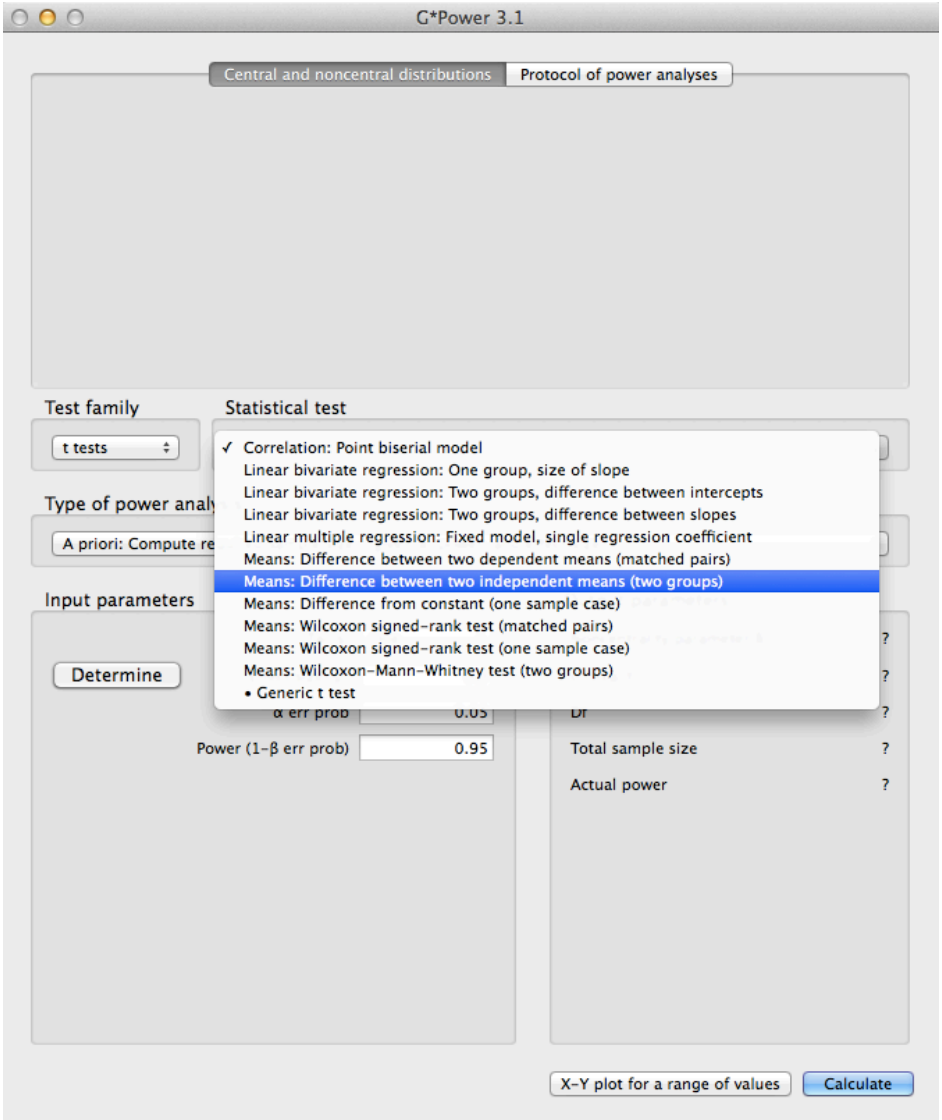
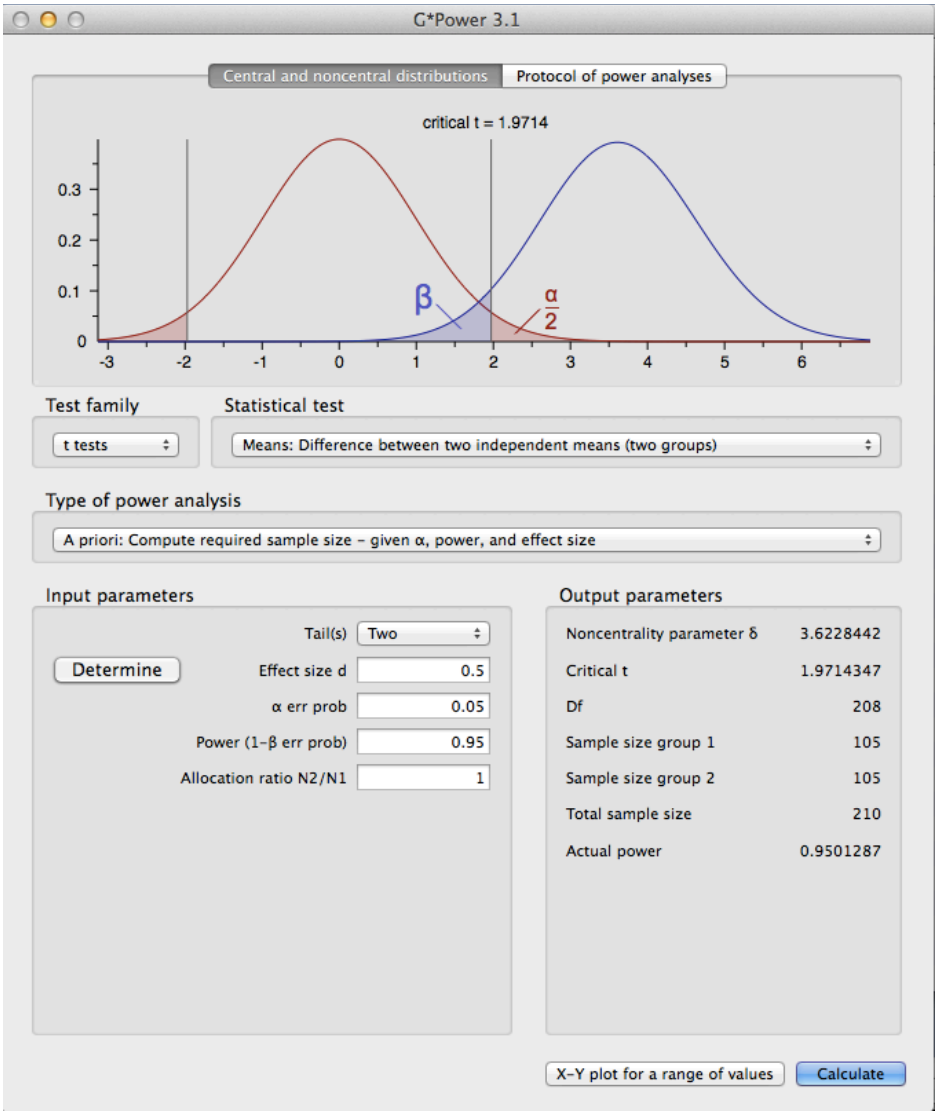
SPSS Tutorial 5: Power calculations

1. This tutorial will involve doing power calculations using G*Power (available for free to download http://www.gpower.hhu.de/en.html).

2. We'll focus on doing a power/sample size calculation for the independent-samples t-test. Open G*Power, and under "Test family", make sure the "t tests" option is chosen. Then under "Statistical test" make sure "Means: Difference between two independent means (two groups)" is selected.

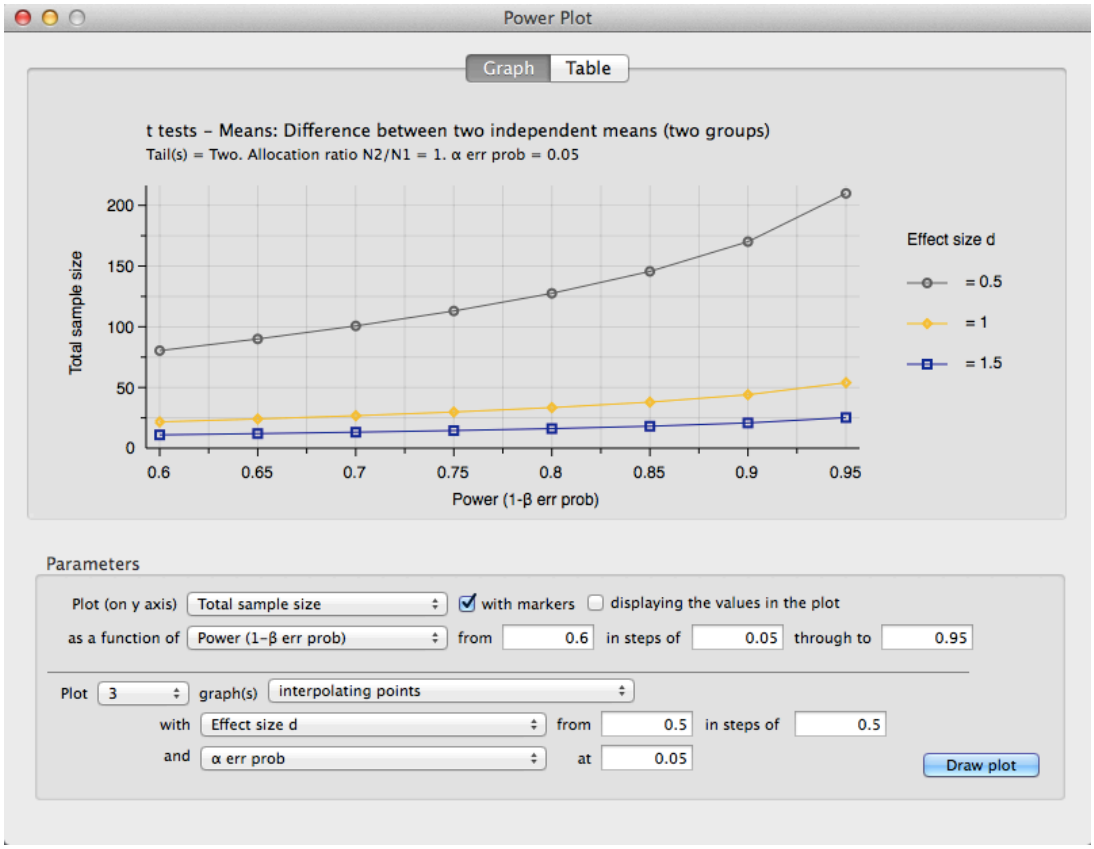


3. Next, adjust the input parameters. Choose a two-tailed test, and set the effect size to 0.5, the alpha-error probability to 0.05, the power to 0.95, and the allocation ratio to 1. Click on "Calculate" to get the required sample size in each group to achieve the desired power. The distribution plot can be saved using File->Save distributions plot.



4. Finally, by clicking on "X-Y plot for a range of values", a plot can be made demonstrating the required sample size for different powers and different effect sizes. Enter parameters as seen in the window below and click "Draw Plot" to obtain the sample size vs. power plot for three different effect sizes. The plot can be saved using File->Save X-Y Plot.

5. In the main window select "F tests" and "ANOVA: Fixed effects, omnibus, one-way". Play around with the parameters and see how they affect power in the one-way ANOVA.


Power Plot
Graph
Table
t tests – Means: Difference between two independent means (two groups)
Tail(s) = Two. Allocation ratio N2/N1 = 1. α err prob = 0.05
Total sample size
200
150
100
50
0
0.6
0.65
0.7
0.75
0.8
0.85
0.9
0.95
Power (1-β err prob)
Effect size d
= 0.5
= 1
= 1.5
Parameters
Plot (on y axis) Total sample size with markers displaying the values in the plot
as a function of Power (1−β err prob) from 0.6 in steps of 0.05 through to 0.95
Plot 3 graph(s) interpolating points
with Effect size d from 0.5 in steps of 0.5
and α err prob at 0.05
Draw plot