Independent Samples T-Test

The purpose of a power analysis is to evaluate the sensitivity of a design and test. You have chosen to calculate the minimum sample size needed to have an experiment sensitive enough to consistently detect the specified hypothetical effect size.

A Priori Power Analysis

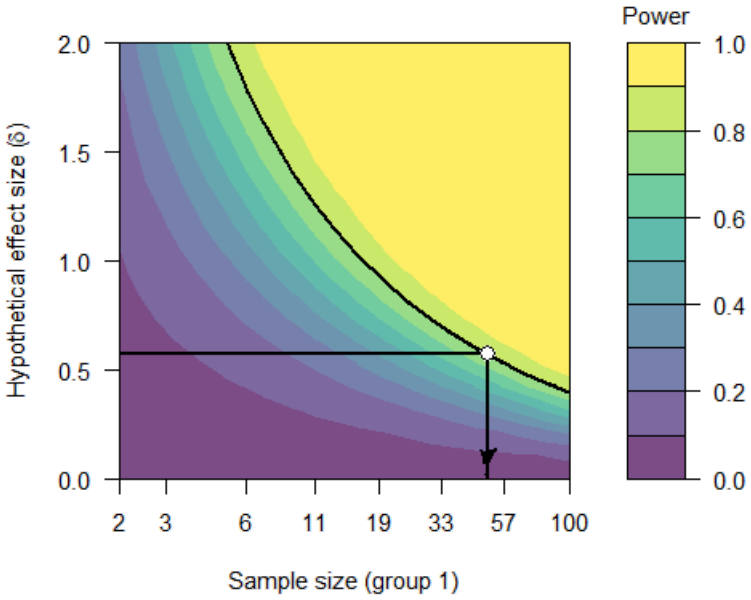
		User Defined		
N_1	N_2	Effect Size	Power	α
49	49	0.573	0.800	0.050

We would need a sample size of 49 in each group to reliably (with probability greater than 0.8) detect an effect size of δ≥0.573, assuming a two-sided criterion for detection that allows for a maximum Type I error rate of Î±=0.05.To evaluate the design specified in the table, we can consider how sensitive it is to true effects of increasing sizes; that is, are we likely to correctly conclude that |δ|>0 when the effect size is large enough to care about?

Power by Effect Size

True effect size	Power to detect	Description
0 < d = 0.400	≤50%	Likely miss
0.400 < d = 0.572	50% – 80%	Good chance of missing
0.572 < d = 0.736	80% – 95%	Probably detect
d = 0.736	≥95%	Almost surely detect

Power Contour



The power contour plot shows how the sensitivity of the test changes with the hypothetical effect size and the sample sizes in the design. As we increase the sample sizes, smaller effect sizes become reliably detectable.Conversely, if one is satisfied to reliably detect only larger effect sizes, smaller sample sizes are needed. The solid black curve on the contour plot shows sample size/effect size combinations with a power of 0.8. The point shows the specified design and effect size.