

15.9: Power of Within-Subjects Designs Demo

Learning Objectives

- State the relationship between variance and power
- State the effect of using a one-tailed test on power

Instructions

This simulation demonstrates the effect of the correlation between measures in a one-way within-subjects ANOVA with two levels. This test is equivalent to a correlated t test. The default values for this demonstration are for an experiment with 10 subjects each measured under two conditions. The population difference for the two conditions is 1.85 and the variance in each of the conditions is 4.0. The graph shows the power of the test as a function of the population correlation between the two scores for the 0.10, 0.05, and 0.01 significance levels. The power of an independent-groups t test (which assumes the correlation is 0) is shown by the x' s.

Experiment with different combinations of the parameters. Is the correlation an important factor in power?

Illustrated Instructions

Video Demo

The video begins by changing the population variance to 8 and increases the sample size to 25 and then reduces it to 5. Notice the impact that these changes have on the relationship between power and population correlation. The video concludes by changing the mean difference to 4.

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