

Testing differences between two samples

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Testing the difference between two variances

This can be tested with a variance ratio test:

$$F = \frac{s_2^2}{s_1^2} = \frac{s_1^2}{s_2^2}$$

The largest value is placed in the numerator. This test is compared to the F distribution for a significance decision.

If the variances do not test different you can calculate a pooled variance as:

$$s_p^2 = \frac{df_1 s_1^2 + df_2 s_2^2}{df_1 + df_2}$$

Testing the difference between two means

The means of two samples can be tested for difference by:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_p^2}{n_1} + \frac{s_p^2}{n_2}}}$$

Also See:

Chapter 9 - Significance of a Difference between Two Means pages 108-124 in:

Phillips, J. L. 2000. How to think about statistics. W. H. Freeman and Co. New York. 202 pp. ISBN 0-7167-3654-3

Chapter 9 - Two-Sample Hypotheses pages 126-130 in:

Zar, J. H. 1999. Biostatistical Analysis. Prentice-Hall, Inc. Englewood Cliffs, New Jersey. 718 pp.