**Pitman's *T*: Comparing Variances of Correlated Samples**

If you have two correlated samples and wish to test the null hypothesis that they were drawn from populations with identical variances, Pitman's *t* is the statistic for you. Here is how to compute it:

* Compute *F* as the ratio of the larger variance to the smaller variance.
* Compute , where *n* is the number of pairs of scores and *r* is the correlation between the scores in sample 1 and the scores in sample 2.
* Evaluate this *t* on *n*−2 degrees of freedom.

Here is an example. We have pre- and post-intervention scores for a screening test for problem drinking (of ethanol). Here are the descriptive statistics:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Descriptive Statistics** | | | | | |
|  | N | Minimum | Maximum | Mean | Std. Deviation |
| AUDIT\_Baseline | 18 | 0 | 10 | 3.61 | 2.304 |
| AUDIT\_Post | 18 | 0 | 6 | 2.61 | 1.335 |
| Valid N (listwise) | 18 |  |  |  |  |

Notice that the scores are less variable after the intervention than before the intervention. Is the difference in variances large enough to be significant. F =(2.301/1.335)2 = 2.971.

I’ll need the pre-post *r2*:

|  |  |  |
| --- | --- | --- |
| Model | R | R Square |
| 1 | .828a | .685 |



df = 16, p = .0009.

References

Howell, D. C. (1997). *Statistical methods for psychology* (4th ed.). Belmont, CA: Duxbury. (page 202).

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Snedecor, G. W., & Cochran, W. G. (1967). *Statistical methods* (6th ed.). Ames, IA: Iowa State University.

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[Karl L. Wuensch](http://core.ecu.edu/psyc/WuenschK/KLW.htm), June, 2016