

WINAI BODHISUWAN : A COMPARISON OF THE TEST STATISTICS FOR
HOMOGENEITY OF VARIANCES. THESIS ADVISOR : ASSOCIATE PROFESSOR
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The purpose of this research is to study the probability of type I error and the power of the test statistics for homogeneity of variances of three and four populations by using Bartlett's test, O'Brien's test and Squared Rank test when all samples were taken from the same parent distributions and some samples were taken from different one. Equal and unequal sample sizes were studied at 0.01 and 0.05 significance level with difference variance ratio. Data for the study were generated by using the Monte Carlo technique. Each condition was replicated 1,000 times.

Results of the study are as follow :-

1. O'Brien's test, Bartlett's test and Squared Rank test had probability of type I error closed to the 0.01 and 0.05 significance levels for the normal distribution. For many cases of the nonnormal distribution O'Brien's test could control the probability of type I error while the other tests could not.
2. When some samples were taken from the normal and only one sample was taken from Weibull distribution, all three tests could control the probability of type I error. The power of Bartlett's test was found to be higher than other tests.
3. When some samples were taken form the normal and only one sample was taken from exponential distribution or t-distribution O'Brien's test and Squared Rank test could control the probability of type I error. The power of O'Brien test was a little higher than the power of Squared Rank test.
4. The power of the test depended on the variance ratio, distribution of the population and sample sizes respectively.
5. The power of Bartlett's test was found to be generally high in the cases of normal distribution. The power of O'Brien test was found to be generally higher than others in the case of nonnormal distribution.

Consequently, when the distribution of population is known, the test should be followed from the results above. If the distribution of population is not known, the O'Brien test should be chosen.