Testing independence under a block compound symmetry covariance structure

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Abstract

The goal of this article is to test the hypothesis related to the independence of features between any two repeated measures in a block compound symmetry structure under the doubly multivariate normal model.
The Rao score and Wald test statistics are determined and the characteristic function of the likelihood ratio test statistic is presented. For all of these test statistics, the asymptotic distributional properties are compared using simulation studies, and the robustness of the empirical distributions is considered. Furthermore, for power analysis purpose, the Kullback-Leibler divergence is proposed to measure discrepancy between hypotheses and the power of each mentioned tests, as well as F-test and Roy's largest root test, is studied. Finally, all mentioned tests are applied to a real data example

Keywords

Doubly multivariate model, Block compound symmetry, Rao score test, Wald test, Likelihood ratio test, Roy's largest root test, Independence, Entropy loss function, Power