Testing means in two-level compound symmetry multivariate data

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Abstract

Many experimental designs, especially in medical sciences, lead to special variance structures in multivariate data. Since the number of observations is rarely large, it is important to take this special structure into account as it substantially reduces the number of estimated parameters.

We consider simple multivariate model

$$\boldsymbol{X} = \boldsymbol{M} + \boldsymbol{E},$$

where $\boldsymbol{M}$ is a location or mean matrix, and $\boldsymbol{E}$ is an error matrix. The variance matrix of $\boldsymbol{E}$ is assumed to be doubly-exchangeable, i.e. block-wise compound symmetry. We develop test procedures for all basic tests of location needed in various applications.

Keywords

Multivariate linear model, Location testing, Special variance structures, Two-level compound symmetry.

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