Estimation of Interclass and Intraclass Correlations in Multivariate Familial Data

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Summary
Asymptotically normal estimators of interclass and intraclass correlations are derived for more than two quantitative characteristics of parent and siblings in a simple random sampling of families that have different numbers of offspring. These estimators are proposed as an alternative to the maximum likelihood estimators, which can be found only by iterative methods requiring prohibitively large amounts of computation. The asymptotic variances of the proposed estimators are also given. In an illustrative example, these easily computable estimators are seen to be comparable to the corresponding maximum likelihood estimators.

Key words:
Asymptotic theory;
Delta method;
Maximum likelihood estimation;
Quasi-Newton method.