Comparing for one-way fixed effects models the usual and the random sample sizes ANOVA

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Abstract

We extend the theory of one-way fixed effects ANOVA to situations where the samples sizes may not be previously known. This often occurs when there is a fixed time span for collecting the observations. A motivation example is the collection of data from patients with several pathologies arriving at a hospital during a fixed time period, see e.g. [1, 2].

In these cases it is more appropriate to consider the sample sizes as realizations of independent random variables. We assume that the samples were generated by Poisson counting processes.

We present the test statistics and their conditional and unconditional distributions, under the assumption that we have random sample sizes. We also show how to compute correct critical values which may be important to avoid working with incorrect test levels, see [2]

Finally, we carry out with a simulation study, to compare and relate the performance of the proposed approach with those of common ANOVA.

Keywords

Random sample sizes, Counting processes, Correct critical values, Simulation study.

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References

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