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Minimal sample size in balanced ANOVA models and its calculation using the R package “miniSize”

Tuesday, June 28, 2022 11:50 AM (20 minutes)

We consider balanced one-way, two-way, and three-way ANOVA models to test the hypothesis that the fixed factor A has no effect. The other factors are fixed or random. We determine the noncentrality parameter for the exact F-test, describe its minimal value by a sharp lower bound, and thus we can guarantee the worst-case power for the F-test. These results allow us to compute the minimal sample size,
i.e. the minimal number of experiments needed. Additionally, we provide a structural result for the minimal sample size that we call “pivot” effect (cf. also Spangl et al., 2021). We further present the newly developed R package “miniSize” and give some examples of how to use its functionality to calculate the minimal sample size.

Reference:
Spangl, B., Kaiblinger, N., Ruckdeschel, P. & Rasch, D. (2021).
Minimal sample size in balanced ANOVA models of crossed, nested, and mixed classifications.
Communications in Statistics - Theory and Methods,
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Keywords

ANOVA; F-test; minimal sample size determination

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