ACCURACY AND POWER OF PARAMETRIC AND NON-PARAMETRIC HOMOCEDASTICY TESTS ASSESSED FOR SIMULATION

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▪ *ABSTRACT: In the present study were compared the parametric tests of homogeneity of variances Bartlett, Brown-Forsythe, O'Brien, Levene with the absolute and square options; and non-parametric tests Siegel-Tukey, Ansari-Bradley, Klotz, and Mood, using simulation data. For this were simulated 10,000 experiments at SAS for eight different scenarios of analysis of variance for simple classification and errors with normal, uniform or exponential distribution. Comparisons under the homoscedasticity assumptions were made (for robustness) and heteroscedasticity (for power). Additionally, were considered null and non-null treatments and balanced or unbalanced data purposes. The results indicate that among the parametric tests investigated, Bartlett test showed better performance with high power, influenced by the unbalanced data and accuracy when the error distribution is normal. Levene test (absolute) resembles Bartlett in power, but it is inaccurate and liberal in any distribution of errors. Levene test (square) is exact for normal underlying distribution and slightly liberal for the other, less power than the Bartlett and Levene (absolute) test. Brown-Forsythe test is inaccurate, imprecise with power from moderate to high. O'Brien test were the worst performance, among the parametric tests, being conservative, imprecise and unstable power. Non-parametric tests Siegel-Tukey, Ansari-Bradley, Klotz and Mood are similar in power, are inaccurate and, with the exception of the Klotz test are accurate in the absence of treatment effects. We recommend using the Bartlett test data is approximately normal, otherwise, given their greater robustness, the Levene test preferably with two options, square for accuracy and for absolute power.*

▪ *KEYWORDS: Homoscedasticity tests; simulation; precision; power.*

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