

ON NONPARAMETRIC BOOTSTRAP TEST FOR THE RETAINED NUMBER OF PRINCIPAL COMPONENTS

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- **ABSTRACT:** *One of the many goals of the multivariate analysis is to reduce dimensionality, i.e., search for more parsimonious models. In this sense, the technique of principal component can be used. After the principal components were determined one should choose the ideal number of components to be retained in order to synthesize the information contained in the p original variables in a simplified model. Some criteria for this choice are proposed in the literature, most of them have serious limitations that were used as justification for this study. the aim of this study was to propose a new test for determining the optimal number of principal components to be retained, based on the proportion of explanation of the total variation of the k first components ($k < p$). The evaluation of type i error rates, power and robustness of these tests was made by Monte Carlo simulations. This test was compared with Fujikoshi's test. Under multivariate normality the Fujikoshi's test is recommended, since it showed the highest power and controlled the type i error. under non-normality the non-parametric bootstrap test was considered robust, since it controlled the type i error and should be recommended.*
- **KEYWORDS:** *Análise Multivariada; componentes principais; teste Bootstrap.*

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