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Analysis of means approach for random factor analysis

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ABSTRACT

Analysis of means (ANOM) is a powerful tool for comparing means and variances in fixed-effects models. The graphical exhibit of ANOM is considered as a great advantage because of its interpretability and its ability to evaluate the practical significance of the mean effects. However, the presence of random factors may be problematic for the ANOM method. In this paper, we propose an ANOM approach that can be applied to test random effects in many different balanced statistical models including fixed-, random- and mixed-effects models. The proposed approach utilizes the range of the treatment averages for identifying the dispersions of the underlying populations. The power performance of the proposed procedure is compared to the analysis of variance (ANOVA) approach in a wide range of situations via a Monte Carlo simulation study. Illustrative examples are used to demonstrate the usefulness of the proposed approach

and its graphical exhibits, provide meaningful interpretations, and discuss the statistical and practical significance of factor effects.

KEYWORDS:

Analysis of means | analysis of variance | multiple comparison | random effect | Tukey test

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Disclosure statement

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