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# Testing for the absence of random effects in a two-way nested design with mixed effects model: a nonparametric approach

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**Abstract** Two-way nested design with mixed effects model arises in many practical situations. In the classical analysis of variance set-up, a test for the absence of the random effects is obtained under the assumption that the random effects and the errors are normally distributed. The present paper avoids this assumption and provides an asymptotically distribution-free test procedure for the above problem. The asymptotic null distribution of the test statistic is obtained. Actual implementation of the test is straight forward given the prior information on quantiles of the intra-block differences of observations. In the absence of such information, working test procedures are proposed. The performances of these tests are compared with the classical analysis of variance test through simulations. The tests are then illustrated by some real data sets.

**Keywords** Analysis of variance · Asymptotically distribution free · Normal error