

**ANALYSIS OF LINEAR MODELS WITH TWO FACTORS HAVING BOTH FIXED AND RANDOM LEVELS**

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A general theory for a case where some factors have both fixed and random effect levels is developed under a two-way treatment structure model. This is an extension of a one factor with both fixed and random levels (Njuho and Milliken, 2005). We consider several alternative approaches for estimating the fixed effects and the variance components using mixed models. We propose conducting the analysis in stages depending on the hypothesis being tested. The computational procedures are illustrated using two numerical examples.