

Wien, am 28.11.07

Einladung
Zum
5. Biometrischen Seminar
am
Donnerstag, den 17.1.2008, 15.00 h
in der Bibliothek des Institutes,
Schwackhöferhaus, 1. Stock, Zimmer 01/107

Vortragender: Ass. Prof. Dr. Karl Moder

Thema: **A new approach to evaluate interaction in block design.**

Abstract:

In a block design a test on interaction is difficult because of no replications within subclasses. In this situation it is not possible to separate interaction from the error term. Tukey (1949) introduced some restrictions to the structure of interaction, in particular that the interaction effect $\tau_{ij} = \lambda\alpha_i\beta_j$ (α_i ... effect of the factor, $i=1, \dots, a$; β_j ... block effect, $j=1, \dots, b$). This means, that interaction is the product of factor and block effects. Firstly if there is no influence of one of these effects no interaction exists. Secondly interaction depends on main effects in a non additive way. Similar restrictions can be found with Mandel (1961) and Johnson & Graybill (1972). In the proposed method no constraint to the structure of interaction are made, but there are some restriction to the design of the experiment. A well known design which allows estimation of these interactions is latin square. But in addition to the ordinary assumption that $\sum \gamma_i = 0$ (γ_i ... column effect, $i=1, \dots, a=b$), we also assume that all interaction effects sum up to zero. This is very intuitive, as this is the common assumption for interactions within blocks. As there is nor real distinction between blocks and columns this assumption seems to be reasonable. The method as such however is not restricted to latin squares but can be generalized to a very broad range of experimental designs.

References

Johnson, D.E. & Graybill, F.A. (1972). An analysis of a two-way model with interaction and no replication, *Journal of the American Statistical Association* **67**, 862–868.

Mandel, J. (1961). Non-additivity in two-way analysis of variance, *Journal of the American Statistical Association* **56**, 878–888.

Tukey, J.W. (1949). One degree of freedom for nonadditivity, *Biometrics* **5**, 232–242.