Dr. Ronald Hocking Lecture Series

"An Afternoon of Linear Models and Its Applications"

Friday, April 20, 2007

1:00 pm – 5:00 pm

Zachry Engineering Center, Room 102

Order of Program:

1:00-1:15 pm	Master of Ceremony Dr. Simon Sheather, Head of Statistics

1:15 pm	Dr. Ronald Hocking, Professor Emeritus, Texas A&M University "An EM-AVE Approach for Mixed Model Analysis" rrhocking@aol.com
2:00 pm	Break

2:15 pm	Dr. Dallas Johnson, Professor Emeritus, Kansas State University "Some Messy Experimental Designs" dejohnsn@cox.net
3:00 pm	Break

3:15 pm	Dr. Michael Kutner, Professor and Chair, Biostatistics, Emory University "Analysis of Fixed Effects ANOVA Models with Missing Cells" mkutner@sph.emory.edu
4:00 pm	Break

4:15 pm	Dr. Ramon Littell, Professor and Assoc. Chair, Ag-Statistics, University of Florida "Modeling Variance and Covariance Structure in Mixed Linear Models" littell@stat.ufl.edu

5:00 pm	Reception
7:00 pm	Dinner (By Invitation) Catered by Epicures

2007 RONALD HOCKING LECTURE SERIES
"An Afternoon of Linear Models and Its Applications"

RONALD R. HOCKING

Professor Emeritus
Department of Statistics
Texas A&M University

AN EM-AVE APPROACH FOR MIXED MODEL ANALYSIS

ABSTRACT:

In this paper I will use three examples to illustrate an approach to the analysis of data from mixed models. The AVE method is an alternative method for computing the parameter estimates with balanced data. The idea is that the variance components or certain functions of them can be obtained as the averages of sample variances and covariances computed from the data. This suggests an approach to examining the data, the design and the model.

When the data are unbalanced, I use the EM algorithm to input values for the missing data. The AVE method can be used for diagnostics as usual. Inferences on the fixed and random effects are obtained from the Analysis of Variance table for balanced data. The sums of squares are computed as usual from the imputed data and they are associated with fractional degrees of freedom computed by the method.

DATE: Friday, April 20, 2007
TIME: 1:15 p.m. – 2:00 p.m.
PLACE: Room 102, Zachry Engineering Center

The ceremony will begin at 1:00 pm. A reception will follow the lectures from 5:00 pm to 6:30 pm at Dr. Jeff Hart's Home.

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DALLAS E. JOHNSON

Professor Emeritus
Kansas State University

SOME MESSY EXPERIMENTAL DESIGNS

ABSTRACT:

This talk will discuss several designs that some of my consulting clients have used when conducting experiments. While the designs appear to be logical and reasonable to the client, they provide challenges to the statistician trying to figure out a correct analysis. One design that will be discussed is described below.

An experiment was being conducted to compare three treatments on pigs. The treatments were A: uninfested, B: infested and treated, and C: infested and untreated. The experiment was conducted on 24 male and 24 female pigs. The 24 pigs of each gender were assigned to blocks according to weight. There were three pigs in each block. That is, there are 8 blocks of male pigs and 8 blocks of female pigs. Two pigs of each gender which have been assigned the same treatment are placed in the same pen. Thus, there are 12 pens each containing four pigs, two males and two females. Because of the nature of the treatments, the pigs that are assigned to the same pen must all receive the same treatment. Finally, measurements are taken on each pig weekly for five weeks. How should the resulting data be analyzed?

DATE: Friday, April 20, 2007
TIME: 2:15 p.m. – 3:00 p.m.
PLACE: Room 102, Zachry Engineering Center

The ceremony will begin at 1:00 pm. A reception will follow the lectures from 5:00 pm to 6:30 pm at Dr. Jeff Hart's Home.

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MICHAEL KUTNER

Rollins Professor and Chair
Department of Biostatistics, Rollins School of Public Health
Emory University

ANALYSIS OF FIXED EFFECTS ANOVA MODELS WITH MISSING CELLS

ABSTRACT:

Many standard statistical software programs claim to "handle" fixed effects ANOVA models when some of the cells do not contain data (missing cell problem). Simple examples using SAS and SPSS will be given documenting how these programs "handle" the missing cells. The sources of these difficulties will be delineated. Examples will be provided documenting these difficulties. Methods for handling these difficulties will be given.

DATE: Friday, April 20, 2007
TIME: 3:15 p.m. – 4:00 p.m.
PLACE: Room 102, Zachry Engineering Center

The ceremony will begin at 1:00 pm. A reception will follow the lecture from 5:00 pm to 6:30 pm at Dr. Jeff Hart's Home.

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RAMON C. LITTELL

Professor and Associate Chair
Department of Ag-Statistics
University of Florida

MODELING VARIANCE AND COVARIANCE STRUCTURE IN MIXED LINEAR MODEL

ABSTRACT:

Mixed models contain terms for both fixed and random effects. They are used to model data in which observations cannot reasonably be assumed independent. Commonly occurring examples include industrial split-plot-type experiments and pharmaceutical studies with repeated measures. The usual primary objective in such studies is to make inference about fixed effects. The covariance structure of the data must be considered in order to obtain valid inference about fixed effects. Appropriate standard errors of estimates are needed for confidence intervals and tests of hypotheses. In addition, the covariance structure may be required in order to compute efficient fixed effect estimates using maximum likelihood or generalized least squares. Covariance structure modeling begins with identifying the experimental or sampling units. Graphical methods can reveal variance and covariance trends, and information criteria are useful for selecting analytical forms of structure.

DATE: Friday, April 20, 2007
TIME: 4:15 p.m. – 5:00 p.m.
PLACE: Room 102, Zachry Engineering Center

The ceremony will begin at 1:00 pm. A reception will follow the lectures from 5:00 pm to 6:30 pm at Dr. Jeff Hart's Home.