

Order Restricted Statistical Inference

T. ROBERTSON, F. T. WRIGHT & R. L. DYKSTRA, 1988

New York, Wiley

xix + 520 pp., £50.00

ISBN 0 471 917 877

This excellent book is a long overdue update on the 1972 work of Barlow, Bartholomew, Bremner and Brunk entitled *Statistical Inference Under Order Restrictions* also published by Wiley. Many advances in the field of order restricted statistical inference have been made in the intervening 16 years, and this book makes a valiant attempt to bring them all together and record them. The structure of the book is based on that of the founding work of Barlow *et al.* incorporating a “compliments” section at the end of each chapter with historical comments and a brief mention of some topics not included in the chapter. The book comprises of nine chapters entitled: (1) Isotonic regression, (2) Tests of ordered hypotheses: the normal means case, (3) Approximations to the χ^2 and E^2 distributions, (4) Tests of ordered hypotheses: generalisations of the likelihood ratio tests and other procedures, (5) Inferences about a set of multinomial parameters, (6) Duality, (7) Inferences regarding distributions subject to “shape” restrictions, (8) Conditional expectation given a σ -lattice: projections in a more general setting, (9) Complements. In addition there are 47 pages of tables and an invaluable collection of over 800 references.

The book is quite technical and will be of primary interest to the researcher. However, parts of it are at a level suitable for inclusion in a graduate level course. While the authors have had the goal of providing a comprehensive updating of the whole subject of statistical inference under inequality constraints, they have also, at their own admission, chosen to emphasize topics reflecting their own particular interests and biases. In particular, they have chosen to emphasize those procedures that are based on the likelihood principle. Nevertheless, Chapter 4 for instance, contains a useful discussion of other types of test procedures such as contrast tests and multiple contrast tests. In the preface the authors express the opinion that order restricted inference will continue to be a fertile area for research, and at various points throughout the book indications are given of the need for further development and research. In particular, the final chapter discusses some topics which at this time are not fully developed such as the formation of useful simultaneous confidence intervals in the order restricted setting. In conclusion, this book is essential reading for anyone with a serious interest in the important area of order restricted statistical inference.

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*University of Bath, UK***E. T. Jaynes: Papers on Probability, Statistics and Statistical Physics**

R. D. ROSENKRANTZ (Ed.), 1989

London, Kluwer

xxiv + 434 pp., £22.00

ISBN 0 7923 0213 3

Edwin Jaynes is probably only known to statisticians who have attended subjective Bayesian symposia or have heard the preachings of the MaxEnt religion. He started out in statistical physics using maximum entropy, but more recently has pushed a subjective Bayesian approach more generally.

Despite its 1989 date, this is a reprint of a 1983 collection of a number of Jaynes' papers 1957–80. The early papers are on the foundations of statistical physics published in physics journals; later papers are more expository from symposia proceedings. The papers are facsimile reproductions of the originals preceded by a few comments from Jaynes (often of the kind ‘look how prescient I was’).

Many readers of this review will have experienced the frustration of mathematically-trained colleagues missing the subtlety of statistical philosophy. In my experience physicists have a similar difficulty; they think in terms of a very narrow range of exemplars involving omnipresent independence. Reading this volume will help to understand the physicists' leanings, as well as

some of the background of the MaxEnt fraternity. Jaynes is widely revered in that community, but is nowhere near as extreme as his disciples.

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Pooled Time Series Analysis

LOIS W. SAYRS, 1989

Newbury Park, CA, Sage

78 pp., £5.50

ISBN 0-8039-3160-3

The aim of this monograph (as illuminated in the series' publishers' goals on the back cover) is to introduce and demonstrate pooled time series analysis to "readers with a limited background in statistics or mathematics" and, obviously, a key question is: does it achieve this goal? After struggling through the 78 pages, I can only say no. Unfortunately, the presentation is altogether too brief and requires a decent econometrics text to back it up. If this were, for example, Maddala (1977) or Kmenta (1971) then one would also find a far more accessible exposition of this topic where its relationship to regression and analysis of variance is made clear. This short monograph would benefit from more examples to illustrate the points. For instance, until an unnecessarily complicated real-data example is given, it is not very clear just what a pooled time series is—it consists of a response variable and (maybe several) explanatory variables measured simultaneously for several situations (sites, cases or individuals) through time. The author presents four "fixes" which can be made to a simple linear regression model to cope with the dependencies likely to afflict such data. These "new" models are never fully exposed, remaining lost in the poorly defined notation and four-letter abbreviations. The few plots are poor by today's standards of computer presentation, the data are never adequately described and the tables of diagnostics are not very palatable.

The author labels sections in degree of difficulty on a scale from A to C. I assume that A is the easiest. If so, then most of the sections deserve to be upgraded to C, because of the treatment each is given. I suggest that a reader interested in pooled time series analysis would be better served by one of the more comprehensive econometric texts.

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References

KMENTA, J. (1971) *Elements of Econometrics* (New York, Macmillan).

MADDALA, G.S. (1977) *Econometrics* (New York, McGraw-Hill).

The Design of Experiments

R. MEAD, 1988

Cambridge, Cambridge University Press

xiv + 620 pp., £65.00

ISBN 0 521 24512 5

It is a great pleasure to see a modern book on the design and analysis of experiments and it is especially good to see one written by Professor Mead, who has contributed so much to the subject in the past. Although the word 'analysis' is omitted from the title, experiments are indeed analysed in the text, but it is difficult to find a new title on this subject.

After the introduction the author discusses the principles of blocking, randomization and the choice of treatments. The general theory of least squares estimation is considered next and this leads to the nested hypothesis procedure and overparameterization. The section ends with a critical appraisal of computer printout from popular packages (Genstat and SAS).

I am not quite sure why the author has adopted a musical theme for his treatise, but the text is divided into four parts which are assigned appropriate names for a musical composition. After the overture the first subject returns to some of the design concepts described earlier. The