

THE 1983 HENRY L. RIETZ MEMORIAL LECTURE¹

THE ANALYSIS OF CROSS-CLASSIFIED DATA HAVING ORDERED AND/OR UNORDERED CATEGORIES: ASSOCIATION MODELS, CORRELATION MODELS, AND ASYMMETRY MODELS FOR CONTINGENCY TABLES WITH OR WITHOUT MISSING ENTRIES

BY LEO A. GOODMAN²

University of Chicago

CONTENTS

1. Introduction and Summary
2. Models for Row Scores and Column Scores in the $I \times J$ Table
 - 2.1. Association Models
 - 2.2. Correlation Models
 - 2.3. Comparison between Association Models and Correlation Models
 - 2.3.1. Introductory comments
 - 2.3.2. Association models and a generalized bivariate normal with arbitrary marginals
 - 2.3.3. Correlation models, association models, and generalized bivariate multinomial distributions
 - 2.4. Correlation Models, Association Models, Canonical Correlation, and Correspondence Analysis
 - 2.5. An Overview and Some Additional Models
3. Models for Generalized Symmetry, Independence, and Symmetry + Independence in the $K \times K$ Table
 - 3.1. Introductory Comments
 - 3.2. Generalized Symmetry Models
 - 3.3. Generalized Independence Models
 - 3.4. Generalized Symmetry + Independence Models
 - 3.5. Some Comparisons, An Overview, and Some Additional Models
4. Unordered Parameters and/or Ordered Parameters
- References
- Appendix: Maximum-Likelihood Estimation

1. Introduction and summary. Let me begin this lecture in commemoration of Henry L. Rietz, the first president of the Institute of Mathematical

Received July 1984; revised October 1984.

¹ This paper is the written version of the Henry L. Rietz Memorial Lecture for 1983, presented at the invitation of the Institute of Mathematical Statistics, at the joint annual meeting of the Institute of Mathematical Statistics, the American Statistical Association, the Canadian Statistical Society, and the Biometric Society, in Toronto, Canada, on 16 August 1983. Part of the research presented here (the material on the relationship between association models and correspondence analysis) was discussed briefly by the author at the International Meeting on the Analysis of Multidimensional Contingency Tables, at the University of Rome, under the auspices of the Italian Statistical Society, on 26 June 1981.

² Support for this research was provided in part by National Science Foundation Grant SES-8303838. The written version of the Rietz Memorial Lecture was completed while the author was a