Contents

1 Introduction 1
- 1.1 The Lives of Fisher and Neyman 1
  - 1.1.1 Fisher 1
  - 1.1.2 Neyman 2
- 1.2 Karl Pearson (1857–1936) 3
- 1.3 William Sealy Gosset ("Student") (1876–1937) 5
- 1.4 Egon S. Pearson (1895–1980) 6
- 1.5 Fisher's Foundations Paper 8
- 1.6 Estimation and Testing 10

2 Fisher's Testing Methodology 13
- 2.1 The Small-Sample and χ^2 Papers 13
- 2.2 "Statistical Methods for Research Workers" I 15
- 2.3 "Statistical Methods for Research Workers" II 17
- 2.4 The Reception of SMRW 20
- 2.5 The Assumption of Normality 22
- 2.6 The Impact of Fisher's SMRW 25
- 2.7 Snedecor's "Statistical Methods": (George Snedecor) 27

3 The Neyman-Pearson Theory 29
- 3.1 Start of the Collaboration 29
- 3.2 Likelihood Ratio Tests 31
- 3.3 A New Approach 34
- 3.4 The Core Results 36
- 3.5 The Process of Joint Work 39
- 3.6 Retrospective 41

4 Fisher's Dissent 45
- 4.1 Fisher's Early Reaction 45
- 4.2 The Fourfold Table 47
- 4.3 The Behrens-Fisher Problem 49

4.4 Fixed Significance Levels vs. *p*-values 51
4.5 Fisher's "Statistical Methods and Scientific Inference" 53
4.6 Inductive Inference vs. Inductive Behavior 55
4.7 Personal Aspects I 57
4.8 Personal Aspects II 59

5 The Design of Experiments and Sample Surveys 63
5.1 Lady Tasting Tea 63
5.2 An Experiment of Darwin's 65
5.3 Randomized Blocks 66
5.4 Latin Squares 68
5.5 Factorial Designs 69
5.6 More Complex Designs 71
5.7 Further Developments 71
5.7.1 Randomization 72
5.7.2 Analysis of Variance (ANOVA) 72
5.7.3 Optimality 73
5.8 Design of Sample Surveys 73

6 Estimation 77
6.1 Point Estimation 77
6.2 Fiducial Inference 78
6.3 Confidence Intervals 80
6.4 Some Priority Considerations 81
6.5 Fisher's Concept of Probability 83

7 Epilog 87
7.1 A Review 87
7.1.1 Hypothesis Testing 87
7.1.2 Design 88
7.1.3 Interval Estimation 89
7.1.4 The Role of Statistics in the Philosophy of Science 89
7.2 Further Developments 91
7.2.1 Multivariate Analysis 91
7.2.2 Bayesian Inference 91
7.2.3 Statistical Decision Theory 92
7.2.4 Nonparametric Inference 92
7.2.5 Robustness 93

Appendix 95

References 103

Name Index 107

Subject Index 109

http://www.springer.com/978-1-4419-9499-8

Fisher, Neyman, and the Creation of Classical Statistics
Lehmann, E.L.
2011, VIII, 115 p. 8 illus., Softcover
ISBN: 978-1-4419-9499-8