

# *Statistical Methods for Geography*

Rogerson P.A. (2001) (Sage: London)

Peter Rogerson, Professor of Geography at the University of Buffalo, has authored a textbook to accompany a one-semester course on inferential statistical analysis. *Statistical Methods for Geography* provides a statistics course text for geographers in the third year undergraduate or masters level. At 236 pages, including appendix and index, the book is slim in comparison with many introductory statistics books. To suit the one-semester course requirements, the material covered is organised into ten chapters:

1. Introduction to Statistical Analysis in Geography
2. Probability and Probability Models
3. Hypothesis Testing and Sampling
4. Analysis of Variance
5. Correlation
6. Introduction to Regression Analysis
7. More on Regression
8. Spatial Patterns
9. Some Spatial Aspect of Regression Analysis
10. Data Reduction: Factor Analysis and Cluster Analysis

Prof. Rogerson points out that many statistics courses cover the basics, that is, hypothesis testing, ANOVA and correlation to finish with multivariate regression; yet, these texts fail to cover the interesting bits, where geographers use statistical techniques. This book is aimed to rectify this gap, and it succeeds. For example, the chapter 'more on regression' starts with logistic regression when often this is not even covered in introductory statistics texts.

In the introduction, the book is clear in its concern with the special problems of spatial statistics and returns to this important theme throughout. Two chapters are devoted to spatial issues: spatial patterns and spatial aspects of regression. These two chapters cover the joint-count statistic, Moran's I, the expansion method and spatially weighted regression. The chapter on spatial analysis differentiates the book from competitors and provides a strong argument for great care in interpreting spatial statistics. You are urged to complete two exercises on different area sizes before carrying on – but the temptation to continue was too great. The coverage allows the author to refer students to recent geographical journal articles that use: factor analysis in regression, logistic regression, principal component analysis and cluster analysis, respectively. The chapters are well thought out and it is clear that the book benefits from a concern to involve students in the practical difficulties of establishing whether inferences can be made from data; moreover, the discussions include some of the difficulties in interpreting and modelling.

Each chapter begins with learning objectives for the ensuing chapter. There are illustrations of each of the techniques throughout the chapter. The treatment is mathematical; the text is peppered with symbols. Students unfamiliar with mathematical symbols may find the treatment more arduous. However, the text is filled with examples that ought to resonate with geographers. The relevance of the statistics to geography is

demonstrated throughout. However, many examples concentrate on the Great Lakes region and I am not sure that these examples are appropriate for a UK audience. Aficionados of American sports that boast teams from Buffalo have two statistical examples, which may appeal to a (male?) American audience. Each chapter's penultimate section concerns a 'how to' set of instructions for SPSS 9.0 for Windows. The incorporation of SPSS version 9.0 will date the book, and quickly. Indeed, version 10 is already available. Nonetheless, this section is necessary to put the last touches to the course because students can undertake the statistics problems on computer and learn-by-doing. Without the SPSS section, students would have to buy or access another text, so the rationale for including this section is correct and is supported through datasets that are available over the web. Each chapter finishes with exercises for students to demonstrate that they have come to terms with the statistics presented.

The treatment is thorough. Prof. Rogerson comes across as an exact tutor, and preciseness is valuable in statistics. But to succeed in his chosen task of covering the statistical methods that geographers use most often, Prof. Rogerson is forced to use a rather terse account of the basics and this terseness carries on throughout the book. I would hesitate to present the book as an introductory statistics course, though as a refresher for masters' students I would suggest that the book is excellent. There is a mistake on page 183 figure 8.3 seems to have some lines missing which makes the following the discussion more difficult. Overall, this is a book that I would happily introduce masters level students but would hesitate to introduce less mathematically inclined undergraduates. Alternatively, a research-orientated course would benefit from many of the techniques that the book covers. A list of recent articles that use the techniques is provided in the epilogue, these would be a very useful adjunct to the course, which would help more pragmatic learners see the significance of the problems discussed. Finally, Prof. Rogerson points the reader to the next texts for them to carry on their study of statistics in geographical research.

This book is a contribution to a very crowded marketplace. It differentiates itself through its concern with spatial problems and through its use of geographical examples. This is a complete course reader, up-to-date and will provide a thorough grounding for students before they attempt a piece of quantitative research. It is well thought out. I enjoyed reading the text, although it required some effort on my part and I did not attempt the exercises. If you teach a course on statistical methods for geography, this book is at least worth a look.

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