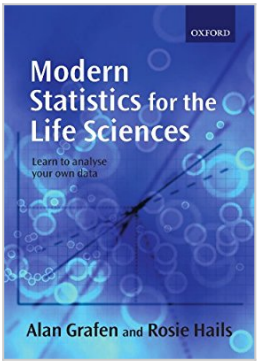

Modern Statistics for the Life Sciences

By Alan Grafen, Rosie Hails

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Model formulae represent a powerful methodology for describing, discussing, understanding, and performing the component of statistical tests known as linear statistics. It was developed for professional statisticians in the 1960s and has become increasingly available as the use of computers has grown and software has advanced. *Modern Statistics for Life Scientists* puts this methodology firmly within the grasp of undergraduates for the first time. The authors assume a basic knowledge of statistics--up to and including one and two sample t-tests and their non-parametric equivalents. They provide the conceptual framework needed to understand what the method does--but without mathematical proofs--and introduce the ideas in a simple and steady progression with worked examples and exercises at every stage.

This innovative text offers students a single conceptual framework for a wide range of tests-including t-tests, oneway and multiway analysis of variance, linear and polynomial regressions, and analysis of covariance-that are usually introduced separately. More importantly, it gives students a language in which they can frame questions and communicate with the computers that perform the analyses. A companion website, www.oup.com/grafenhails, provides a wealth of worked exercises in the three statistical languages; Minitab, SAS, and SPSS. Appropriate for use in statistics courses at undergraduate and graduate levels, *Modern Statistics for the Life Sciences* is also a helpful resource for students in non-mathematics-based disciplines using statistics, such as geography, psychology, epidemiology, and ecology.

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'The book is well laid out and concepts are very well explained by making effective use of diagrams and geometric representations. There are many analyses of example data sets to ilustrate the application the methods and the interpretation of the output'. Biometrics 59, 200-209, March
2003.

"it is a stepping-stone between one's first statistics course and what one really needs as a professional biologist. That said, it is the best stepping-stone on the market". Trends in Ecology and Evolution, 2003.

"Grafen and Hails have written a very nice book...many examples also serve to highlight design or analysis errors that are commonly made and encourage constructive critism: learning from mistakes is, I think, a very powerful approach." Animal Behaviour 2003

About the Author

Degrees in Experimental Psychology, Economics and Zoology have exposed Professor Alan Grafen to various different statistical traditions, and also to his main research interest in how adaptive complexity arises through natural selection. He has been interested in statistics since he was an undergraduate, learned mathematical theory of statistics as a graduate student, and encountered modern statistics in the package GLIM as a research student. The impetus to produce a systematic introduction for undergraduates to model formulae and the General Linear Model came from his appointment in 1989 to a lectureship in Quantitative Biology at Oxford University. Degrees in Zoology, Pest Management and Population Dynamics led Dr Rosie Hails toward the more quantitative areas of ecology. Most of her research career has developed the theme of the potential impacts of biological invasions, with reference to both natural invasions and genetically modified organisms. In the early 1990s, she was involved in the first experiments monitoring the behaviour and population dynamics of transgenic plants in natural habitats across the UK with Professor Mick Crawley. More recently, at the NERC Centre for Ecology and Hydrology in Oxford, her research themes have included the dynamics of wildlife diseases as well as plants. In moving to Oxford, Dr Hails became involved in teaching Professor Alan Grafen's undergraduate course, principally through a position at St Anne's College.

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