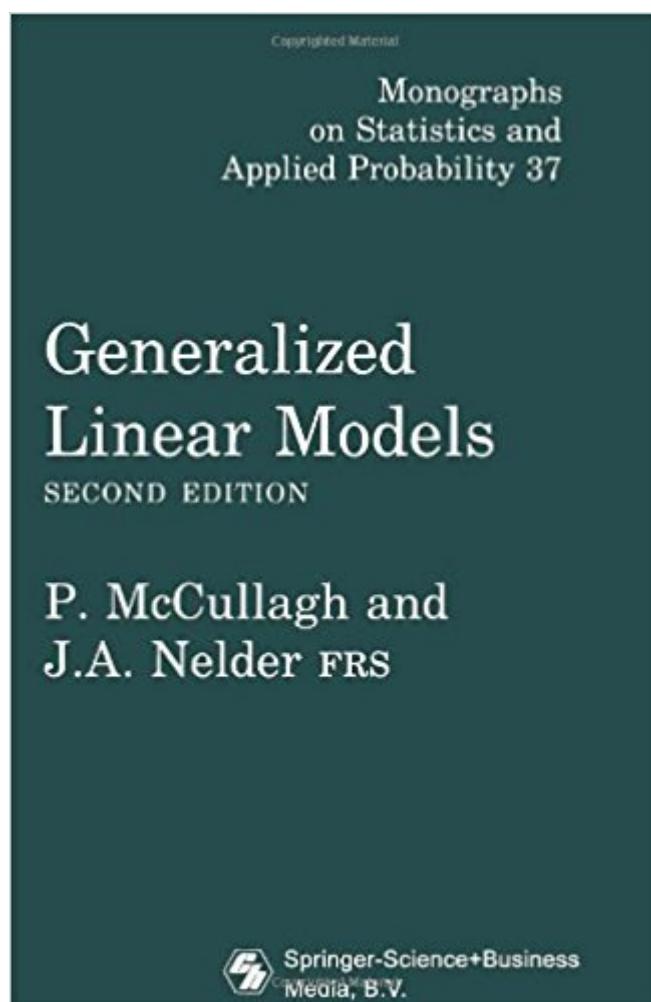


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# Generalized Linear Models, Second Edition (Chapman & Hall/CRC Monographs On Statistics & Applied Probability)



## Synopsis

The success of the first edition of Generalized Linear Models led to the updated Second Edition, which continues to provide a definitive unified, treatment of methods for the analysis of diverse types of data. Today, it remains popular for its clarity, richness of content and direct relevance to agricultural, biological, health, engineering, and other applications. The authors focus on examining the way a response variable depends on a combination of explanatory variables, treatment, and classification variables. They give particular emphasis to the important case where the dependence occurs through some unknown, linear combination of the explanatory variables. The Second Edition includes topics added to the core of the first edition, including conditional and marginal likelihood methods, estimating equations, and models for dispersion effects and components of dispersion. The discussion of other topics-log-linear and related models, log odds-ratio regression models, multinomial response models, inverse linear and related models, quasi-likelihood functions, and model checking-was expanded and incorporates significant revisions. Comprehension of the material requires simply a knowledge of matrix theory and the basic ideas of probability theory, but for the most part, the book is self-contained. Therefore, with its worked examples, plentiful exercises, and topics of direct use to researchers in many disciplines, Generalized Linear Models serves as ideal text, self-study guide, and reference.

## Book Information

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## Customer Reviews

..." an important, useful book, well-written by two authorities in the field..." -Times Higher Education Supplement ..." an enormous range of work is covered... represents, perhaps, the most important field of research in theoretical and practical statistics. For all statisticians working in this field, the book is essential." -Short Book Reviews ..." this is a rich book; rich in theory, rich in examples, and rich in a statistical sense. I highly recommend it." -Biometrics ..." a definitive and unified presentation...by the outstanding experts of this field." -Statistics "This is a wonderful book... Reading the book is like listening to a good lecturer. The authors present the material clearly, and they treat the reader with respect. There is a balance between discussion, mathematical presentation of models, and examples." -Technometrics ..." a complete introduction to the topic in a single monograph... a very readable book that provides the reader with great insight into a vast array of data analysis techniques... -Siam Review ..." a unique and useful text for intermediate undergraduate teaching." -THES

This was one of two books that were references for a course I took in Generalized Linear Models - GLM. This was an excellent book in explaining the technical (mathematical) details of the GLM, such as the importance of the link function (how covariates/predictors/explanatory variables are related to the response), the importance of moment generating functions and cumulant generating functions, and the contribution of various types of likelihoods (like conditional, quasi, and partial ) in parameter estimation in GLM. It also covers things like geometrical interpretations...which seems to be very important in the multivariate setting. Most of the problems in the book lean towards proofs. For example... problem 4.7 asks you to show that the ratio of a binomial and poisson random variable is asymptotically equivalent to a constant. This book is kinda old, so things like Bayesian regression (which I'm not acquainted with...yet) or high dimensional data analysis are not going to be in this book. I know that the latest edition of Agresti's Categorical Data Analysis (CDA) does cover these topics though. Still, I think that the McCullagh book is more mathematically rigorous than Agresti's book, since it covers things like the geometrical interpretation of least squares estimation. This book was clearly written for researchers who have a quantitative background - those who have a background in at least intermediate statistical theory (Casella & Berger) as well as statistical Linear Modeling. Anybody who only has some of this knowledge would probably find Agresti's Categorical Data Analysis more accessible (this was the other book used in our GLM course), and those don't have any math experience might find Agresti's An Introduction to Categorical Data Analysis a better book.

A statistician's bible for generalized linear models. Indispensable for students and statisticians.

Reasonable price. Fast shipping.

This book is very well structured and easy to follow. It provides both detailed mathematical foundation of each topic and practical examples to showcase their usefulness in application.

I found it difficult to follow this book. It is not meant for dummies like me. However, I don't have any alternative suggestions.

This book is the best theoretical work on Generalized Linear Models I have read. The mathematical foundations are gradually built from basic statistical theory and expanded until one has a good sense of the power and scope of the Generalized Linear Model approach to regression. As a learning text, however, the book has some deficiencies. GLM beginners probably want to know answers to questions like: 1) Why should I perform GLM rather than OLS? 2) How do I determine an appropriate variance and link function? 3) How can I test whether my GLM has outperformed OLS? As is, the reader has to read through some 500 pages of theory to find answers to these relatively simple questions. There is real room for a text that could provide an easier approach to mastering this material. Even so, the book succeeds in its aim to provide an authoritative guide to GLM theory and practice. It deserves a place on every applied statistician's bookshelf.

This is an important book. It is a mature, deep introduction to generalized linear models. General linear models extend multiple linear models to include cases in which the distribution of the dependent variable is part of the exponential family and the expected value of the dependent variable is a function of the linear predictor. Besides the normal (Gaussian) distribution, the binomial distribution, the Poisson distribution and the Gamma distribution, are just some of the exponential family members most frequently encountered in the scientific literature. Using appropriate functions to join the dependent variable to the linear predictor many classic models of applied statistics are included in the broad frame of generalized linear models: "logistic regression", log-linear models, Cox's proportional hazards models are just some of them. Further extensions to the "base" family of generalized linear models, such as those based on the use of quasi-likelihood functions, and models in which both the expected value and the dispersion are functions of a linear predictor, are well presented in the book. Examples, and exercises, introduce many non-banal, useful,

designs. There are some minor drawbacks. Some more advanced topics might have been introduced more smoothly (i.e. conditional likelihood). Some other topics are better understood when you are already familiar with the specific object of study (i.e. Cox's proportional hazards models as a generalized linear model). The book does not provide software examples, nor is it related with any specific statistical package. However, the maturity of the reader to whom the book is addressed should be so high that translating the majority of the examples presented in the book in the "language" of a familiar statistical package should not be a problem.

Nelder and Wedderburn wrote the seminal paper on generalized linear models in the 1970s. Since then John Nelder has pioneered the research and software development of the methods. This is the first of several excellent texts on generalized linear models. It illustrates how through the use of a link function many classical statistical models can be unified into one general form of model. This unification is helpful both theoretically and computationally. Various applications are presented in a clear manner.

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