# Data Analysis Using Regression and Multilevel/Hierarchical Models

*By Andrew Gelman, Jennifer Hill*

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Data Analysis Using Regression and Multilevel/Hierarchical Models is a comprehensive manual for the applied researcher who wants to perform data analysis using linear and nonlinear regression and multilevel models. The book introduces a wide variety of models, whilst at the same time instructing the reader in how to fit these models using available software packages. The book illustrates the concepts by working through scores of real data examples that have arisen from the authors' own applied research, with programming codes provided for each one. Topics covered include causal inference, including regression, poststratification, matching, regression discontinuity, and instrumental variables, as well as multilevel logistic regression and missing-data imputation. Practical tips regarding building, fitting, and understanding are provided throughout. Author resource page: http://www.stat.columbia.edu/~gelman/arm/

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Review
"Data Analysis Using Regression and Multilevel/Hierarchical Models ... careful yet mathematically accessible style is generously illustrated with examples and graphical displays, making it ideal for either classroom use or self-study. It appears destined to adorn the shelves of a great many applied statisticians and social scientists for years to come."
Brad Carlin, University of Minnesota

"Gelman and Hill have written what may be the first truly modern book on modeling. Containing practical as well as methodological insights into both Bayesian and traditional approaches, Data Analysis Using Regression and Multilevel/Hierarchical Models provides useful guidance into the process of building and evaluating models. For the social scientist and other applied statisticians interested in linear and logistic regression, causal inference, and hierarchical models, it should prove invaluable either as a classroom text or as an addition to the research bookshelf."
Richard De Veaux, Williams College

"The theme of Gelman and Hill's engaging and nontechnical introduction to statistical modeling is 'Be flexible.' Using a broad array of examples written in R and WinBugs, the authors illustrate the many ways in which readers can build more flexibility into their predictive and causal models. This hands-on textbook is sure to become a popular choice in applied regression courses."
Donald Green, Yale University

"Simply put, Data Analysis Using Regression and Multilevel/Hierarchical Models is the best place to learn how to do serious empirical research. Gelman and Hill have written a much needed book that is sophisticated about research design without being technical. Data Analysis Using Regression and Multilevel/Hierarchical Models is destined to be a classic!"
Alex Tabarrok, George Mason University

"a detailed, carefully written exposition of the modelling challenge, using numerous convincing examples, and always paying careful attention to the practical aspects of modeling. I recommend it very warmly."
Journal of Applied Statistics

"Gelman and Hill's book is an excellent intermediate text that would be very useful for researchers interested in multilevel modeling... This book gives a wealth of information for anyone interested in multilevel modeling and seems destined to be a classic."
Brandon K. Vaughn, Journal of Eductional Measurement

"With their new book, Data Analysis Using Regression and Multilevel/Hierarchical Models, Drs. Gelman and Hill have raised the bar for what a book on applied statistical modeling should seek to accomplish. The book is extraordinarily broad in scope, modern in its approach and philosophy, and ambitious in its goals... I am tremendously impressed with this book and highly recommend it. Data Analysis Using Regression and Multilevel/Hierarchical Models deserves to be widely read by applied statisticians and practicing researchers, especially in the social sciences. Instructors considering textbooks for courses on the practice of statistical modeling should move this book to the top of their list."
Daniel B. Hall, Journal of the American Statistical Association

"Data Analysis Using Regression and Multilevel/Hierarchical Models is the book I wish I had in graduate school."
Timothy Hellwig, The Political Methodologist

About the Author
Andrew Gelman is Professor of Statistics and Professor of Political Science at Columbia University. He has published over 150 articles in statistical theory, methods, and computation, and in applications areas including decision analysis, survey sampling, political science, public health, and policy. His other books are Bayesian Data Analysis (1995, second edition 2003) and Teaching Statistics: A Bag of Tricks (2002).

Jennifer Hill is Assistant Professor of Public Affairs in the Department of International and Public Affairs at Columbia University. She has co-authored articles that have appeared in the Journal of the American Statistical Association, American Political Science Review, American Journal of Public Health, Developmental Psychology, the Economic Journal and the Journal of Policy Analysis and Management, among others.

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