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Longitudinal Data Analysis - Garrett Fitzmaurice 2008-08-11
Although many books currently available describe statistical models and methods for analyzing longitudinal data, they do not highlight connections between various research threads in the statistical literature. Responding to this void, Longitudinal Data Analysis provides a clear, comprehensive, and unified overview of state-of-the-art theory and applications. It also focuses on the assorted challenges that arise in analyzing longitudinal data. After discussing historical aspects, leading researchers explore four broad themes: parametric modeling, nonparametric and semiparametric methods, joint models, and incomplete data. Each of these sections begins with an introductory chapter that provides useful background material and a broad outline to set the stage for subsequent chapters. Rather than focus on a narrowly defined topic, chapters integrate important research discussions from the statistical literature. They seamlessly blend theory with applications and include examples and case studies from various disciplines. Destined to become a landmark publication in the field, this carefully edited collection emphasizes statistical models and methods likely to endure in the future. Whether involved in the development of statistical methodology or the analysis of longitudinal data, readers will gain new

perspectives on the field.
Multilevel Modeling - G. David Garson 2019-07-31
Multilevel Modeling: Applications in STATA®, IBM® SPSS®, SAS®, R & HLMTM provides a gentle, hands-on illustration of the most common types of multilevel modeling software, offering instructors multiple software resources for their students and an applications-based foundation for teaching multilevel modeling in the social sciences. Author G. David Garson's step-by-step instructions for software walk readers through each package. The instructions for the different platforms allow students to get a running start using the package with which they are most familiar while the instructor can start teaching the concepts of multilevel modeling right away. Instructors will find this text serves as both a comprehensive resource for their students and a foundation for their teaching alike.
Mixed-Effects Models in S and S-PLUS - José C. Pinheiro 2009-04-15
R, linear models, random, fixed, data, analysis, fit.
Linear Mixed Models - BRADY T. WEST 2022-06-24
The third edition provides a comprehensive update of the available tools for fitting linear mixed-effects models in the newest versions of SAS, SPSS, R, Stata, and HLM. There is a focus on new tools for visualization

of results and interpretation. New conceptual and theoretical developments in mixed-effects modeling have been included **Multilevel and Longitudinal Modeling with IBM SPSS** - Ronald H. Heck 2013-08-22
This book demonstrates how to use multilevel and longitudinal modeling techniques available in the IBM SPSS mixed-effects program (MIXED). Annotated screen shots provide readers with a step-by-step understanding of each technique and navigating the program. Readers learn how to set up, run, and interpret a variety of models. Diagnostic tools, data management issues, and related graphics are introduced throughout. Annotated syntax is also available for those who prefer this approach. Extended examples illustrate the logic of model development to show readers the rationale of the research questions and the steps around which the analyses are structured. The data used in the text and syntax examples are available at www.routledge.com/9780415817110. Highlights of the new edition include: Updated throughout to reflect IBM SPSS Version 21. Further coverage of growth trajectories, coding time-related variables, covariance structures, individual change and longitudinal experimental designs (Ch.5). Extended discussion of other types of research designs for examining change (e.g., regression discontinuity, quasi-experimental) over time (Ch.6). New examples specifying multiple latent constructs and parallel growth processes (Ch. 7). Discussion of alternatives for dealing with missing data and the use of sample weights within multilevel data structures (Ch.1). The book opens with the conceptual and methodological issues associated with multilevel and longitudinal modeling, followed by a discussion of SPSS data management techniques which facilitate working with multilevel, longitudinal, and cross-classified data sets. Chapters 3 and 4 introduce the basics of multilevel modeling: developing a multilevel model, interpreting output, and trouble-shooting common programming and modeling problems. Models for investigating individual and organizational change are presented in chapters 5 and 6, followed by models with multivariate outcomes in chapter 7. Chapter 8 provides an illustration of multilevel models with cross-classified data structures. The

book concludes with ways to expand on the various multilevel and longitudinal modeling techniques and issues when conducting multilevel analyses. It's ideal for courses on multilevel and longitudinal modeling, multivariate statistics, and research design taught in education, psychology, business, and sociology.
Multilevel and Longitudinal Modeling with IBM SPSS - Ronald H. Heck 2011-04-27
First Published in 2010. Routledge is an imprint of Taylor & Francis, an informa company.
Generalized Linear Mixed Models - Walter W. Stroup 2012-09-24
Generalized Linear Mixed Models: Modern Concepts, Methods and Applications presents an introduction to linear modeling using the generalized linear mixed model (GLMM) as an overarching conceptual framework. For readers new to linear models, the book helps them see the big picture. It shows how linear models fit with the rest of the core statistics curriculum and points out the major issues that statistical modelers must consider. Along with describing common applications of GLMMs, the text introduces the essential theory and main methodology associated with linear models that accommodate random model effects and non-Gaussian data. Unlike traditional linear model textbooks that focus on normally distributed data, this one adopts a generalized mixed model approach throughout: data for linear modeling need not be normally distributed and effects may be fixed or random. With numerous examples using SAS® PROC GLIMMIX, this book is ideal for graduate students in statistics, statistics professionals seeking to update their knowledge, and researchers new to the generalized linear model thought process. It focuses on data-driven processes and provides context for extending traditional linear model thinking to generalized linear mixed modeling. See Professor Stroup discuss the book.
Multilevel Linear Models - Andy P. Field 2013

Multilevel Modeling of Categorical Outcomes Using IBM SPSS - Ronald H. Heck 2012
"Preface Multilevel modeling has become a mainstream data analysis

tool over the past decade, now figuring prominently in a range of social and behavioral science disciplines. Where it originally required specialized software, mainstream statistics packages such as IBM SPSS, SAS, and Stata all have included routines for multilevel modeling in their programs. Although some devotees of these statistical packages have been making good use of the relatively new multilevel modeling functionality, progress hasbeen slower in carefully documenting these routines to facilitate meaningful access to the average user. Two years ago we developed Multilevel and Longitudinal Modeling with IBM SPSS to demonstrate how to use these techniques in IBM SPSS Version 18. Our focus was on developing a set of concepts and programming skills within the IBM SPSS environment that could be used to develop, specify, and test a variety of multilevel models with continuous outcomes, since IBM SPSS is a standard analytic tool used in many graduate programs and organizations globally. Our intent was to help readers gain facility in using the IBM SPSS linear-mixed models routine for continuous outcomes. We offered multiple examples of several different types of multilevel models, focusing on how to set up each model and how to interpret the output. At the time, mixed modeling for categorical outcomes was not available in the IBM SPSS software program. Over the past year or so, however, the generalized linear mixed model (GLMM) has been added to the mixed modeling analytic routine in IBM SPSS starting with Version 19. This addition prompted us to create this companion workbook that would focus on introducing readers to the multilevel approach to modeling with categorical outcomes"--

Linear Mixed Models for Longitudinal Data - Geert Verbeke 2009-05-12
This book provides a comprehensive treatment of linear mixed models for continuous longitudinal data. Next to model formulation, this edition puts major emphasis on exploratory data analysis for all aspects of the model, such as the marginal model, subject-specific profiles, and residual covariance structure. Further, model diagnostics and missing data receive extensive treatment. Sensitivity analysis for incomplete data is given a prominent place. Most analyses were done with the MIXED procedure of the SAS software package, but the data analyses are presented in a software-independent fashion.

Mixed Effects Models and Extensions in Ecology with R - Alain Zuur 2009-03-05
This book discusses advanced statistical methods that can be used to analyse ecological data. Most environmental collected data are measured repeatedly over time, or space and this requires the use of GLMM or GAMM methods. The book starts by revising regression, additive modelling, GAM and GLM, and then discusses dealing with spatial or temporal dependencies and nested data.

The SAGE Handbook of Multilevel Modeling - Marc A. Scott 2013-08-31
In this important new Handbook, the editors have gathered together a range of leading contributors to introduce the theory and practice of multilevel modeling. The Handbook establishes the connections in multilevel modeling, bringing together leading experts from around the world to provide a roadmap for applied researchers linking theory and practice, as well as a unique arsenal of state-of-the-art tools. It forges vital connections that cross traditional disciplinary divides and introduces best practice in the field. Part I establishes the framework for estimation and inference, including chapters dedicated to notation, model selection, fixed and random effects, and causal inference. Part II develops variations and extensions, such as nonlinear, semiparametric and latent class models. Part III includes discussion of missing data and robust methods, assessment of fit and software. Part IV consists of exemplary modeling and data analyses written by methodologists working in specific disciplines. Combining practical pieces with overviews of the field, this Handbook is essential reading for any student or researcher looking to apply multilevel techniques in their own research.

Applied Longitudinal Data Analysis - Judith D. Singer 2003-03-27
By charting changes over time and investigating whether and when events occur, researchers reveal the temporal rhythms of our lives.

Linear Models with R - Julian J. Faraway 2016-04-19
A Hands-On Way to Learning Data AnalysisPart of the core of statistics,

linear models are used to make predictions and explain the relationship between the response and the predictors. Understanding linear models is crucial to a broader competence in the practice of statistics. Linear Models with R, Second Edition explains how to use linear models

Linear Mixed-Effects Models Using R - Andrzej Gałecki 2013-02-05
Linear mixed-effects models (LMMs) are an important class of statistical models that can be used to analyze correlated data. Such data are encountered in a variety of fields including biostatistics, public health, psychometrics, educational measurement, and sociology. This book aims to support a wide range of uses for the models by applied researchers in those and other fields by providing state-of-the-art descriptions of the implementation of LMMs in R. To help readers to get familiar with the features of the models and the details of carrying them out in R, the book includes a review of the most important theoretical concepts of the models. The presentation connects theory, software and applications. It is built up incrementally, starting with a summary of the concepts underlying simpler classes of linear models like the classical regression model, and carrying them forward to LMMs. A similar step-by-step approach is used to describe the R tools for LMMs. All the classes of linear models presented in the book are illustrated using real-life data. The book also introduces several novel R tools for LMMs, including new class of variance-covariance structure for random-effects, methods for influence diagnostics and for power calculations. They are included into an R package that should assist the readers in applying these and other methods presented in this text.

Generalized Linear Mixed Models - Walter W. Stroup 2016-04-19
Generalized Linear Mixed Models: Modern Concepts, Methods and Applications presents an introduction to linear modeling using the generalized linear mixed model (GLMM) as an overarching conceptual framework. For readers new to linear models, the book helps them see the big picture. It shows how linear models fit with the rest of the core statistics curriculum and points out the major issues that statistical modelers must consider. Along with describing common applications of GLMMs, the text introduces the essential theory and main methodology

associated with linear models that accommodate random model effects and non-Gaussian data. Unlike traditional linear model textbooks that focus on normally distributed data, this one adopts a generalized mixed model approach throughout: data for linear modeling need not be normally distributed and effects may be fixed or random. With numerous examples using SAS® PROC GLIMMIX, this book is ideal for graduate students in statistics, statistics professionals seeking to update their knowledge, and researchers new to the generalized linear model thought process. It focuses on data-driven processes and provides context for extending traditional linear model thinking to generalized linear mixed modeling. See Professor Stroup discuss the book.

A Handbook of Statistical Analysis Using SPSS - Sabine Landau 2017-09-11
A Handbook of Statistical Analyses Using SPSS clearly describes how to conduct a range of univariate and multivariate statistical analyses using the latest version of the Statistical Package for the Social Sciences, SPSS 11. Each chapter addresses a different type of analytical procedure applied to one or more data sets, primarily from the social and behavioral sciences areas. Each chapter also contains exercises relating to the data sets introduced, providing readers with a means to develop both their SPSS and statistical skills. Model answers to the exercises are also provided. Readers can download all of the data sets from a companion Web site furnished by the authors.

Writing to Learn Academic Words - Breno B. Silva 2022-09-23
This book highlights the importance of English academic vocabulary for success at university and explores written tasks as effective pedagogical tools to promote the acquisition of academic words. The book reviews germane and recent SLA, psycholinguistic, corpus linguistics, and L2 writing research to underscore the challenges associated with the learning of academic words. Then, it reports on three empirical studies conducted in the Polish context. The first study develops a reliable tool to assess the knowledge of academic vocabulary of undergraduate learners. The second and third studies investigate the learning of academic words after the writing of sentences and argumentative essays, and discuss the

role of cognition as a mediator of such learning. The book also provides an accessible introduction to linear mixed-effect models, a powerful, reliable, and flexible statistical technique that has been gaining popularity among SLA and psycholinguistics researchers.

Regression Modeling Strategies - Frank E. Harrell 2013-03-09 Many texts are excellent sources of knowledge about individual statistical tools, but the art of data analysis is about choosing and using multiple tools. Instead of presenting isolated techniques, this text emphasizes problem solving strategies that address the many issues arising when developing multivariable models using real data and not standard textbook examples. It includes imputation methods for dealing with missing data effectively, methods for dealing with nonlinear relationships and for making the estimation of transformations a formal part of the modeling process, methods for dealing with "too many variables to analyze and not enough observations," and powerful model validation techniques based on the bootstrap. This text realistically deals with model uncertainty and its effects on inference to achieve "safe data mining".

Methods and Applications of Longitudinal Data Analysis - Xian Liu 2015-09-11 Methods and Applications of Longitudinal Data Analysis describes methods for the analysis of longitudinal data in the medical, biological and behavioral sciences. It introduces basic concepts and functions including a variety of regression models, and their practical applications across many areas of research. Statistical procedures featured within the text include: descriptive methods for delineating trends over time linear mixed regression models with both fixed and random effects covariance pattern models on correlated errors generalized estimating equations nonlinear regression models for categorical repeated measurements techniques for analyzing longitudinal data with non-ignorable missing observations Emphasis is given to applications of these methods, using substantial empirical illustrations, designed to help users of statistics better analyze and understand longitudinal data. Methods and Applications of Longitudinal Data Analysis equips both graduate students

and professionals to confidently apply longitudinal data analysis to their particular discipline. It also provides a valuable reference source for applied statisticians, demographers and other quantitative methodologists. From novice to professional: this book starts with the introduction of basic models and ends with the description of some of the most advanced models in longitudinal data analysis Enables students to select the correct statistical methods to apply to their longitudinal data and avoid the pitfalls associated with incorrect selection Identifies the limitations of classical repeated measures models and describes newly developed techniques, along with real-world examples.

Multilevel Analysis for Applied Research - Robert Bickel 2007-03-19 This book provides a uniquely accessible introduction to multilevel modeling, a powerful tool for analyzing relationships between an individual-level dependent variable, such as student reading achievement, and individual-level and contextual explanatory factors, such as gender and neighborhood quality. Helping readers build on the statistical techniques they already know, Robert Bickel emphasizes the parallels with more familiar regression models, shows how to do multilevel modeling using SPSS, and demonstrates how to interpret the results. He discusses the strengths and limitations of multilevel analysis and explains specific circumstances in which it offers (or does not offer) methodological advantages over more traditional techniques. Over 300 dataset examples from research on educational achievement, income attainment, voting behavior, and other timely issues are presented in numbered procedural steps.

Multilevel Modeling of Categorical Outcomes Using IBM SPSS - Ronald H Heck 2013-05-07 This is the first workbook that introduces the multilevel approach to modeling with categorical outcomes using IBM SPSS Version 20. Readers learn how to develop, estimate, and interpret multilevel models with categorical outcomes. The authors walk readers through data management, diagnostic tools, model conceptualization, and model specification issues related to single-level and multilevel models with categorical outcomes. Screen shots clearly demonstrate techniques and

navigation of the program. Modeling syntax is provided in the appendix. Examples of various types of categorical outcomes demonstrate how to set up each model and interpret the output. Extended examples illustrate the logic of model development, interpretation of output, the context of the research questions, and the steps around which the analyses are structured. Readers can replicate examples in each chapter by using the corresponding data and syntax files available at www.psypress.com/9781848729568. The book opens with a review of multilevel with categorical outcomes, followed by a chapter on IBM SPSS data management techniques to facilitate working with multilevel and longitudinal data sets. Chapters 3 and 4 detail the basics of the single-level and multilevel generalized linear model for various types of categorical outcomes. These chapters review underlying concepts to assist with trouble-shooting common programming and modeling problems. Next population-average and unit-specific longitudinal models for investigating individual or organizational developmental processes are developed. Chapter 6 focuses on single- and multilevel models using multinomial and ordinal data followed by a chapter on models for count data. The book concludes with additional trouble shooting techniques and tips for expanding on the modeling techniques introduced. Ideal as a supplement for graduate level courses and/or professional workshops on multilevel, longitudinal, latent variable modeling, multivariate statistics, and/or advanced quantitative techniques taught in psychology, business, education, health, and sociology, this practical workbook also appeals to researchers in these fields. An excellent follow up to the authors' highly successful Multilevel and Longitudinal Modeling with IBM SPSS and Introduction to Multilevel Modeling Techniques, 2nd Edition, this book can also be used with any multilevel and/or longitudinal book or as a stand-alone text introducing multilevel modeling with categorical outcomes.

Doing Meta-Analysis with R - Mathias Harrer 2021-09-15
Doing Meta-Analysis with R: A Hands-On Guide serves as an accessible introduction on how meta-analyses can be conducted in R. Essential steps for meta-analysis are covered, including calculation and pooling of outcome measures, forest plots, heterogeneity diagnostics, subgroup analyses, meta-regression, methods to control for publication bias, risk of bias assessments and plotting tools. Advanced but highly relevant topics such as network meta-analysis, multi-three-level meta-analyses, Bayesian meta-analysis approaches and SEM meta-analysis are also covered. A companion R package, dmetar, is introduced at the beginning of the guide. It contains data sets and several helper functions for the meta and metafor package used in the guide. The programming and statistical background covered in the book are kept at a non-expert level, making the book widely accessible. Features • Contains two introductory chapters on how to set up an R environment and do basic imports/manipulations of meta-analysis data, including exercises • Describes statistical concepts clearly and concisely before applying them in R • Includes step-by-step guidance through the coding required to perform meta-analyses, and a companion R package for the book
SAS for Mixed Models - Walter W. Stroup 2018-12-12
Discover the power of mixed models with SAS. Mixed models—now the mainstream vehicle for analyzing most research data—are part of the core curriculum in most master's degree programs in statistics and data science. In a single volume, this book updates both SAS® for Linear Models, Fourth Edition, and SAS® for Mixed Models, Second Edition, covering the latest capabilities for a variety of applications featuring the SAS GLIMMIX and MIXED procedures. Written for instructors of statistics, graduate students, scientists, statisticians in business or government, and other decision makers, SAS® for Mixed Models is the perfect entry for those with a background in two-way analysis of variance, regression, and intermediate-level use of SAS. This book expands coverage of mixed models for non-normal data and mixed-model-based precision and power analysis, including the following topics: Random-effect-only and random-coefficients models Multilevel, split-plot, multilocation, and repeated measures models Hierarchical models with nested random effects Analysis of covariance models Generalized linear mixed models This book is part of the SAS Press program.
Linear Mixed Models - Brady T. West 2006-11-22

Simplifying the often confusing array of software programs for fitting linear mixed models (LMMs), Linear Mixed Models: A Practical Guide Using Statistical Software provides a basic introduction to primary concepts, notation, software implementation, model interpretation, and visualization of clustered and longitudinal data. This easy-to-nav

Linear Mixed Models - Brady T. West 2022-06-24
Highly recommended by JASA, Technometrics, and other leading statistical journals, the first two editions of this bestseller showed how to easily perform complex linear mixed model (LMM) analyses via a variety of software programs. Linear Mixed Models: A Practical Guide Using Statistical Software, Third Edition continues to lead readers step-by-step through the process of fitting LMMs. The third edition provides a comprehensive update of the available tools for fitting linear mixed-effects models in the newest versions of SAS, SPSS, R, Stata, and HLM. All examples have been updated, with a focus on new tools for visualization of results and interpretation. New conceptual and theoretical developments in mixed-effects modeling have been included, and there is a new chapter on power analysis for mixed-effects models. Features: Dedicates an entire chapter to the key theories underlying LMMs for clustered, longitudinal, and repeated measures data Provides descriptions, explanations, and examples of software code necessary to fit LMMs in SAS, SPSS, R, Stata, and HLM Contains detailed tables of estimates and results, allowing for easy comparisons across software procedures Presents step-by-step analyses of real-world data sets that arise from a variety of research settings and study designs, including hypothesis testing, interpretation of results, and model diagnostics Integrates software code in each chapter to compare the relative advantages and disadvantages of each package Supplemented by a website with software code, datasets, additional documents, and updates Ideal for anyone who uses software for statistical modeling, this book eliminates the need to read multiple software-specific texts by covering the most popular software programs for fitting LMMs in one handy guide. The authors illustrate the models and methods through real-world examples that enable comparisons of model-fitting options and results across the software procedures.

Modern Statistics with R - Måns Thulin 2021-07-28
The past decades have transformed the world of statistical data analysis, with new methods, new types of data, and new computational tools. The aim of Modern Statistics with R is to introduce you to key parts of the modern statistical toolkit. It teaches you: - Data wrangling - importing, formatting, reshaping, merging, and filtering data in R. - Exploratory data analysis - using visualisation and multivariate techniques to explore datasets. - Statistical inference - modern methods for testing hypotheses and computing confidence intervals. - Predictive modelling - regression models and machine learning methods for prediction, classification, and forecasting. - Simulation - using simulation techniques for sample size computations and evaluations of statistical methods. - Ethics in statistics - ethical issues and good statistical practice. - R programming - writing code that is fast, readable, and free from bugs. Starting from the very basics, Modern Statistics with R helps you learn R by working with R. Topics covered range from plotting data and writing simple R code to using cross-validation for evaluating complex predictive models and using simulation for sample size determination. The book includes more than 200 exercises with fully worked solutions. Some familiarity with basic statistical concepts, such as linear regression, is assumed. No previous programming experience is needed.

Hierarchical Linear Models - Stephen W. Raudenbush 2002
New edition of a text in which Raudenbush (U. of Michigan) and Bryk (sociology, U. of Chicago) provide examples, explanations, and illustrations of the theory and use of hierarchical linear models (HLM). New material in Part I (Logic) includes information on multivariate growth models and other topics.

Encyclopedia of Research Design - Neil J. Salkind 2010-06-22
"Comprising more than 500 entries, the Encyclopedia of Research Design explains how to make decisions about research design, undertake research projects in an ethical manner, interpret and draw valid inferences from data, and evaluate experiment design strategies and results. Two additional features carry this encyclopedia far above other

works in the field: bibliographic entries devoted to significant articles in the history of research design and reviews of contemporary tools, such as software and statistical procedures, used to analyze results. It covers the spectrum of research design strategies, from material presented in introductory classes to topics necessary in graduate research; it addresses cross- and multidisciplinary research needs, with many examples drawn from the social and behavioral sciences, neurosciences, and biomedical and life sciences; it provides summaries of advantages and disadvantages of often-used strategies; and it uses hundreds of sample tables, figures, and equations based on real-life cases."-- Publisher's description.

Mixed Effects Models for Complex Data - Lang Wu 2009-11-11
Although standard mixed effects models are useful in a range of studies, other approaches must often be used in correlation with them when studying complex or incomplete data. Mixed Effects Models for Complex Data discusses commonly used mixed effects models and presents appropriate approaches to address dropouts, missing data, measurement errors, censoring, and outliers. For each class of mixed effects model, the author reviews the corresponding class of regression model for cross-sectional data. An overview of general models and methods, along with motivating examples After presenting real data examples and outlining general approaches to the analysis of longitudinal/clustered data and incomplete data, the book introduces linear mixed effects (LME) models, generalized linear mixed models (GLMMs), nonlinear mixed effects (NLME) models, and semiparametric and nonparametric mixed effects models. It also includes general approaches for the analysis of complex data with missing values, measurement errors, censoring, and outliers. Self-contained coverage of specific topics Subsequent chapters delve more deeply into missing data problems, covariate measurement errors, and censored responses in mixed effects models. Focusing on incomplete data, the book also covers survival and frailty models, joint models of survival and longitudinal data, robust methods for mixed effects models, marginal generalized estimating equation (GEE) models for longitudinal or clustered data, and Bayesian methods for mixed effects models.

Background material In the appendix, the author provides background information, such as likelihood theory, the Gibbs sampler, rejection and importance sampling methods, numerical integration methods, optimization methods, bootstrap, and matrix algebra. Failure to properly address missing data, measurement errors, and other issues in statistical analyses can lead to severely biased or misleading results. This book explores the biases that arise when naïve methods are used and shows which approaches should be used to achieve accurate results in longitudinal data analysis.

Hierarchical Linear Modeling - G. David Garson 2013
This book provides a brief, easy-to-read guide to implementing hierarchical linear modeling using three leading software platforms, followed by a set of original how-to applications articles following a standardard instructional format. The "guide" portion consists of five chapters by the editor, providing an overview of HLM, discussion of methodological assumptions, and parallel worked model examples in SPSS, SAS, and HLM software. The "applications" portion consists of ten contributions in which authors provide step by step presentations of how HLM is implemented and reported for introductory to intermediate applications.

Fixed Effects Regression Models - Paul D. Allison 2009-04-22
This book demonstrates how to estimate and interpret fixed-effects models in a variety of different modeling contexts: linear models, logistic models, Poisson models, Cox regression models, and structural equation models. Both advantages and disadvantages of fixed-effects models will be considered, along with detailed comparisons with random-effects models. Written at a level appropriate for anyone who has taken a year of statistics, the book is appropriate as a supplement for graduate courses in regression or linear regression as well as an aid to researchers who have repeated measures or cross-sectional data. Learn more about "The Little Green Book" - QASS Series! Click Here

Applied Mixed Model Analysis - Jos W. R. Twisk 2019-04-18
Emphasizing interpretation of results, this hands-on guide explains why, when, and how to use mixed models with your data.

Linear Mixed Models - Brady T. West 2014-07-17
Highly recommended by JASA, Technometrics, and other journals, the first edition of this bestseller showed how to easily perform complex linear mixed model (LMM) analyses via a variety of software programs. Linear Mixed Models: A Practical Guide Using Statistical Software, Second Edition continues to lead readers step by step through the process of fitting LMMs. This second edition covers additional topics on the application of LMMs that are valuable for data analysts in all fields. It also updates the case studies using the latest versions of the software procedures and provides up-to-date information on the options and features of the software procedures available for fitting LMMs in SAS, SPSS, Stata, R/S-plus, and HLM. New to the Second Edition A new chapter on models with crossed random effects that uses a case study to illustrate software procedures capable of fitting these models Power analysis methods for longitudinal and clustered study designs, including software options for power analyses and suggested approaches to writing simulations Use of the lmer() function in the lme4 R package New sections on fitting LMMs to complex sample survey data and Bayesian approaches to making inferences based on LMMs Updated graphical procedures in the software packages Substantially revised index to enable more efficient reading and easier location of material on selected topics or software options More practical recommendations on using the software for analysis A new R package (WWGbook) that contains all of the data sets used in the examples Ideal for anyone who uses software for statistical modeling, this book eliminates the need to read multiple software-specific texts by covering the most popular software programs for fitting LMMs in one handy guide. The authors illustrate the models and methods through real-world examples that enable comparisons of model-fitting options and results across the software procedures.

Generalized Linear Mixed Models - Charles E. McCulloch 2003
Wiley Series in Probability and Statistics A modern perspective on mixed models The availability of powerful computing methods in recent decades has thrust linear and nonlinear mixed models into the mainstream of statistical application. This volume offers a modern perspective on generalized, linear, and mixed models, presenting a unified and accessible treatment of the newest statistical methods for analyzing correlated, nonnormally distributed data. As a follow-up to Searle's classic, Linear Models, and Variance Components by Searle, Casella, and McCulloch, this new work progresses from the basic one-way classification to generalized linear mixed models. A variety of statistical methods are explained and illustrated, with an emphasis on maximum likelihood and restricted maximum likelihood. An invaluable resource for applied statisticians and industrial practitioners, as well as students interested in the latest results, Generalized, Linear, and Mixed Models features: * A review of the basics of linear models and linear mixed models * Descriptions of models for nonnormal data, including generalized linear and nonlinear models * Analysis and illustration of techniques for a variety of real data sets * Information on the accommodation of longitudinal data using these models * Coverage of the prediction of realized values of random effects * A discussion of the impact of computing issues on mixed models

Generalized Latent Variable Modeling - Anders Skrondal 2004-05-11
This book unifies and extends latent variable models, including multilevel or generalized linear mixed models, longitudinal or panel models, item response or factor models, latent class or finite mixture models, and structural equation models. Following a gentle introduction to latent variable modeling, the authors clearly explain and contrast a wi

Linear Models in Statistics - Alvin C. Rencher 2008-01-18
The essential introduction to the theory and application of linear models—now in a valuable new edition Since most advanced statistical tools are generalizations of the linear model, it is neces-sary to first master the linear model in order to move forward to more advanced concepts. The linear model remains the main tool of the applied statistician and is central to the training of any statistician regardless of whether the focus is applied or theoretical. This completely revised and updated new edition successfully develops the basic theory of linear models for regression, analysis of variance, analysis of covariance, and

linear mixed models. Recent advances in the methodology related to linear mixed models, generalized linear models, and the Bayesian linear model are also addressed. Linear Models in Statistics, Second Edition includes full coverage of advanced topics, such as mixed and generalized linear models, Bayesian linear models, two-way models with empty cells, geometry of least squares, vector-matrix calculus, simultaneous inference, and logistic and nonlinear regression. Algebraic, geometrical, frequentist, and Bayesian approaches to both the inference of linear models and the analysis of variance are also illustrated. Through the expansion of relevant material and the inclusion of the latest technological developments in the field, this book provides readers with the theoretical foundation to correctly interpret computer software output as well as effectively use, customize, and understand linear models. This modern Second Edition features: New chapters on Bayesian linear models as well as random and mixed linear models Expanded discussion of two-way models with empty cells Additional sections on the geometry of least squares Updated coverage of simultaneous inference The book is complemented with easy-to-read proofs, real data sets, and an extensive bibliography. A thorough review of the requisite matrix algebra has been addedfor transitional purposes, and numerous theoretical and applied problems have been incorporated with selected answers provided at the end of the book. A related Web site includes additional data sets and SAS® code for all numerical examples. Linear Model in Statistics, Second Edition is a must-have book for courses in statistics, biostatistics, and mathematics at the upper-undergraduate and graduate levels. It is also an invaluable reference for researchers who need to gain a better understanding of regression and analysis of variance.

Applied Longitudinal Analysis - Garrett M. Fitzmaurice 2012-10-23 Praise for the First Edition ". . . [this book] should be on the shelf of everyone interestedin . . . longitudinal data analysis." —Journal of the American Statistical Association Features newly developed topics and applications of theanalysis of longitudinal data Applied Longitudinal Analysis, Second Edition presentsmodern methods for analyzing data from longitudinal studies and nowfeatures the latest state-of-the-art techniques. The bookemphasizes practical, rather than theoretical, aspects of methodsfor the analysis of diverse types of longitudinal data that can beapplied across various fields of study, from the health and medicalsciences to the social and behavioral sciences. The authors incorporate their extensive academic and researchexperience along with various updates that have been made inresponse to reader feedback. The Second Edition features six newlyadded chapters that explore topics currently evolving in the field,including: Fixed effects and mixed effects models Marginal models and generalized estimating equations Approximate methods for generalized linear mixed effectsmodels Multiple imputation and inverse probability weightedmethods Smoothing methods for longitudinal data Sample size and power Each chapter presents methods in the setting of applications todata sets drawn from the health sciences. New problem sets havebeen added to many chapters, and a related website features sampleprograms and computer output using SAS, Stata, and R, as well asdata sets and supplemental slides to facilitate a completeunderstanding of the material. With its strong emphasis on multidisciplinary applications andthe interpretation of results, Applied LongitudinalAnalysis, Second Edition is an excellent book for courses onstatistics in the health and medical sciences at theupper-undergraduate and graduate levels. The book also serves as avaluable reference for researchers and professionals in themedical, public health, and pharmaceutical fields as well as thosein social and behavioral sciences who would like to learn moreabout analyzing longitudinal data.

A Life Course Perspective on Health Trajectories and Transitions - Claudine Burton-Jeangros 2015-08-11 This open access book examines health trajectories and health transitions at different stages of the life course, including childhood, adulthood and later life. It provides findings that assess the role of biological and social transitions on health status over time. The essays examine a wide range of health issues, including the consequences of military service on body mass index, childhood obesity and

cardiovascular health, socio-economic inequalities in preventive health care use, depression and anxiety during the child rearing period, health trajectories and transitions in people with cystic fibrosis and oral health over the life course. The book addresses theoretical, empirical and methodological issues as well as examines different national contexts, which help to identify factors of vulnerability and potential resources that support resilience available for specific groups and/or populations. Health reflects the ability of individuals to adapt to their social environment. This book analyzes health as a dynamic experience. It examines how different aspects of individual health unfold over time as a result of aging but also in relation to changing socioeconomic conditions. It also offers readers potential insights into public policies that affect the health status of a population.

Multilevel and Longitudinal Modeling with IBM SPSS - Ronald H. Heck 2011-04-27
This is the first book to demonstrate how to use the multilevel and longitudinal modeling techniques available in IBM SPSS Version 18. The authors tap the power of SPSS''s Mixed Models routine to provide an elegant and accessible approach to these models. Readers who have learned statistics using this software will no longer have to adapt to a new program to conduct quality multilevel and longitudinal analyses. Annotated screen shots with all of the key output provide readers with a step-by-step understanding of each technique as they are shown how to navigate through the program. Diagnostic tools, data management issues, and related graphics are introduced throughout. SPSS commands show the flow of the menu structure and how to facilitate model building. Annotated syntax is also available for those who prefer this approach. Most chapters feature an extended example illustrating the logic of model development. These examples show readers the context and rationale of the research questions and the steps around which the analyses are structured. The data used in the text and syntax examples are available at http://www.psypress.com/multilevel-modeling-techniques/ . The book opens with the conceptual and methodological issues associated with multilevel and longitudinal modeling, followed by a discussion of SPSS data management techniques which facilitate working with multilevel, longitudinal, and/or cross-classified data sets. The next few chapters introduce the basics of multilevel modeling, how to develop a multilevel model, and trouble-shooting techniques for common programming and modeling problems along with potential solutions. Models for investigating individual and organizational change are developed in chapters 5 and 6, followed by models with multivariate outcomes in chapter 7. Chapter 8 illustrates SPSS''s facility for examining models with cross-classified data structures. The book concludes with thoughts about ways to expand on the various multilevel and longitudinal modeling techniques introduced and issues to keep in mind in conducting multilevel analyses. Ideal as a supplementary text for graduate level courses on multilevel, longitudinal, latent variable modeling, multivariate statistics, and/or advanced quantitative techniques taught in departments of psychology, business, education, health, and sociology, this book''s practical approach will also appeal to researchers in these fields. The book provides an excellent supplement to Heck & Thomas''s An Introduction to Multilevel Modeling Techniques, 2nd Edition; however, it can also be used with any multilevel and/or longitudinal modeling book or as a stand-alone text. ps around which the analyses are structured. The data used in the text and syntax examples are available at http://www.psypress.com/multilevel-modeling-techniques/ . The book opens with the conceptual and methodological issues associated with multilevel and longitudinal modeling, followed by a discussion of SPSS data management techniques which facilitate working with multilevel, longitudinal, and/or cross-classified data sets. The next few chapters introduce the basics of multilevel modeling, how to develop a multilevel model, and trouble-shooting techniques for common programming and modeling problems along with potential solutions. Models for investigating individual and organizational change are developed in chapters 5 and 6, followed by models with multivariate outcomes in chapter 7. Chapter 8 illustrates SPSS''s facility for examining models with cross-classified data structures. The book concludes with thoughts

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