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[The Analysis of Covariance and Alternatives](#) - Bradley Huitema
2011-10-24

A complete guide to cutting-edge techniques and best practices for applying covariance analysis methods The Second Edition of Analysis of Covariance and Alternatives sheds new light on its topic, offering in-depth discussions of underlying assumptions, comprehensive interpretations of results, and comparisons of distinct approaches. The book has been extensively revised and updated to feature an in-depth review of prerequisites and the latest developments in the field. The author begins with a discussion of essential topics relating to experimental design and analysis, including analysis of variance, multiple regression, effect size measures and newly developed methods of communicating statistical results. Subsequent chapters feature newly added methods for the analysis of experiments with ordered treatments, including two parametric and nonparametric monotone analyses as well as approaches based on the robust general linear model and reversed ordinal logistic regression. Four groundbreaking chapters on single-case designs introduce powerful new analyses for simple and complex single-case experiments. This Second Edition also features coverage of advanced methods including: Simple and multiple analysis of covariance using both the Fisher approach and the general linear model approach Methods to manage assumption departures, including heterogeneous slopes, nonlinear functions, dichotomous dependent variables, and covariates affected by treatments Power analysis and the application of covariance analysis to randomized-block designs, two-factor designs, pre- and post-test designs, and multiple dependent variable designs Measurement error correction and propensity score methods developed for quasi-experiments, observational studies, and uncontrolled clinical trials Thoroughly updated to reflect the growing nature of the field, Analysis of Covariance and Alternatives is a suitable book for behavioral and medical sciences courses on design of experiments and regression and the upper-undergraduate and graduate levels. It also serves as an authoritative reference work for researchers and academics in the fields of medicine, clinical trials, epidemiology, public health, sociology, and engineering.

[Secondary Analysis of Electronic Health Records](#) - MIT Critical Data
2016-09-09

This book trains the next generation of scientists representing different disciplines to leverage the data generated during routine patient care. It formulates a more complete lexicon of evidence-based recommendations and support shared, ethical decision making by doctors with their patients. Diagnostic and therapeutic technologies continue to evolve rapidly, and both individual practitioners and clinical teams face increasingly complex ethical decisions. Unfortunately, the current state of medical knowledge does not provide the guidance to make the majority of clinical decisions on the basis of evidence. The present research infrastructure is inefficient and frequently produces unreliable results that cannot be replicated. Even randomized controlled trials (RCTs), the traditional gold standards of the research reliability hierarchy, are not without limitations. They can be costly, labor intensive, and slow, and can return results that are seldom generalizable to every patient population. Furthermore, many pertinent but unresolved clinical and medical systems issues do not seem to have attracted the interest of the research enterprise, which has come to focus instead on cellular and molecular investigations and single-agent (e.g., a drug or device) effects. For clinicians, the end result is a bit of a "data desert"

when it comes to making decisions. The new research infrastructure proposed in this book will help the medical profession to make ethically sound and well informed decisions for their patients.

Propensity Score Analysis - Wei Pan 2015-04-07

This book is designed to help researchers better design and analyze observational data from quasi-experimental studies and improve the validity of research on causal claims. It provides clear guidance on the use of different propensity score analysis (PSA) methods, from the fundamentals to complex, cutting-edge techniques. Experts in the field introduce underlying concepts and current issues and review relevant software programs for PSA. The book addresses the steps in propensity score estimation, including the use of generalized boosted models, how to identify which matching methods work best with specific types of data, and the evaluation of balance results on key background covariates after matching. Also covered are applications of PSA with complex data, working with missing data, controlling for unobserved confounding, and the extension of PSA to prognostic score analysis for causal inference. User-friendly features include statistical program codes and application examples. Data and software code for the examples are available at the companion website (www.guilford.com/pan-materials).

Best Practices in Quantitative Methods - Jason W. Osborne 2008

The contributors to Best Practices in Quantitative Methods envision quantitative methods in the 21st century, identify the best practices, and, where possible, demonstrate the superiority of their recommendations empirically. Editor Jason W. Osborne designed this book with the goal of providing readers with the most effective, evidence-based, modern quantitative methods and quantitative data analysis across the social and behavioral sciences. The text is divided into five main sections covering select best practices in Measurement, Research Design, Basics of Data Analysis, Quantitative Methods, and Advanced Quantitative Methods. Each chapter contains a current and expansive review of the literature, a case for best practices in terms of method, outcomes, inferences, etc., and broad-ranging examples along with any empirical evidence to show why certain techniques are better. Key Features: Describes important implicit knowledge to readers: The chapters in this volume explain the important details of seemingly mundane aspects of quantitative research, making them accessible to readers and demonstrating why it is important to pay attention to these details. Compares and contrasts analytic techniques: The book examines instances where there are multiple options for doing things, and make recommendations as to what is the "best" choice—or choices, as what is best often depends on the circumstances. Offers new procedures to update and explicate traditional techniques: The featured scholars present and explain new options for data analysis, discussing the advantages and disadvantages of the new procedures in depth, describing how to perform them, and demonstrating their use. Intended Audience: Representing the vanguard of research methods for the 21st century, this book is an invaluable resource for graduate students and researchers who want a comprehensive, authoritative resource for practical and sound advice from leading experts in quantitative methods.

[Military Caregivers](#) - Terri Tanielian 2013-03-07

Military caregivers are an essential part of our nation's ability to care for returning wounded warriors. Far too often, their own needs are neglected. The RAND Corporation and the Elizabeth Dole Foundation lay the groundwork to inform policy and program development relative to the needs of military caregivers that often differ from the needs of the

general caregiving population.

Tutorials in Biostatistics, Statistical Methods in Clinical Studies -

Ralph B. D'Agostino 2005-09-27

The Tutorials in Biostatistics have become a very popular feature of the prestigious Wiley journal, *Statistics in Medicine* (SIM). The introductory style and practical focus make them accessible to a wide audience including medical practitioners with limited statistical knowledge. This book represents the first of two volumes presenting the best tutorials published in SIM, focusing on statistical methods in clinical studies. Topics include the design and analysis of clinical trials, epidemiology, survival analysis, and data monitoring. Each tutorial is focused on a medical problem, has been fully peer-reviewed and edited, and is authored by leading researchers in biostatistics. Many articles include an appendix on the latest developments since publication in the journal and additional references. This will appeal to statisticians working in medical research, as well as statistically-minded clinicians, biologists, epidemiologists and geneticists. It will also appeal to graduate students of biostatistics.

A Life Course Approach to Healthy Ageing - Diana Kuh 2014

This title investigates the lifetime determinants of healthy ageing and their implications for policy and practice, bringing together authorities in ageing research and knowledge transfer from across the world.

Matched Sampling for Causal Effects - Donald B. Rubin 2006-09-04

Matched sampling is often used to help assess the causal effect of some exposure or intervention, typically when randomized experiments are not available or cannot be conducted. This book presents a selection of Donald B. Rubin's research articles on matched sampling, from the early 1970s, when the author was one of the major researchers involved in establishing the field, to recent contributions to this now extremely active area. The articles include fundamental theoretical studies that have become classics, important extensions, and real applications that range from breast cancer treatments to tobacco litigation to studies of criminal tendencies. They are organized into seven parts, each with an introduction by the author that provides historical and personal context and discusses the relevance of the work today. A concluding essay offers advice to investigators designing observational studies. The book provides an accessible introduction to the study of matched sampling and will be an indispensable reference for students and researchers.

Introduction to Statistical Methods, Design of Experiments and

Statistical Quality Control - Dharmaraja Selvamuthu 2018-09-03

This book provides an accessible presentation of concepts from probability theory, statistical methods, the design of experiments and statistical quality control. It is shaped by the experience of the two teachers teaching statistical methods and concepts to engineering students, over a decade. Practical examples and end-of-chapter exercises are the highlights of the text as they are purposely selected from different fields. Statistical principles discussed in the book have great relevance in several disciplines like economics, commerce, engineering, medicine, health-care, agriculture, biochemistry, and textiles to mention a few. A large number of students with varied disciplinary backgrounds need a course in basics of statistics, the design of experiments and statistical quality control at an introductory level to pursue their discipline of interest. No previous knowledge of probability or statistics is assumed, but an understanding of calculus is a prerequisite. The whole book serves as a master level introductory course in all the three topics, as required in textile engineering or industrial engineering. Organised into 10 chapters, the book discusses three different courses namely statistics, the design of experiments and quality control. Chapter 1 is the introductory chapter which describes the importance of statistical methods, the design of experiments and statistical quality control. Chapters 2-6 deal with statistical methods including basic concepts of probability theory, descriptive statistics, statistical inference, statistical test of hypothesis and analysis of correlation and regression. Chapters 7-9 deal with the design of experiments including factorial designs and response surface methodology, and Chap. 10 deals with statistical quality control.

The Oxford Handbook of Quantitative Methods - Todd D. Little 2014

This two-volume handbook on current best-practices in quantitative methods as practiced in the social, behavioral, and educational sciences covers philosophical and ethical issues, theory construction, model building and types of models, survey and experiment design, measurement issues, observational methods, statistical methods, types of analysis, types of data, and common research fallacies.

Confirmatory Factor Analysis - J. Micah Roos 2021-10-06

Measurement connects theoretical concepts to what is observable in the

empirical world, and is fundamental to all social and behavioral research. In this volume, J. Micah Roos and Shawn Bauldry introduce a popular approach to measurement: confirmatory factor analysis, with examples in every chapter draw from national survey data. Data to replicate the examples are available on a companion website, along with code in R, Stata, and Mplus.

Propensity Score Methods and Applications - Haiyan Bai 2018-11-20

A concise, introductory text, *Propensity Score Methods and Applications* describes propensity score methods (PSM) and how they are used to balance the distributions of observed covariates between treatment conditions as a means to reduce selection bias. This new QASS title specifically focuses on the procedures of implementing PSM for research in social sciences, instead of merely demonstrating the effectiveness of the method. Using succinct and approachable language to introduce the basic concepts of PSM, authors Haiyan Bai and M. H. Clark present basic concepts, assumptions, procedures, available software packages, and step-by-step examples for implementing PSM using real-world data, with exercises at the end of each chapter allowing readers to replicate examples on their own.

Social Policy for Children and Families - William J. Hall 2021-08-10

Written in a conversational and applied style, *Social Policy for Children and Families* is an award-winning book that incorporates cutting-edge research across policy sectors in the human services. New editors William James Hall III and Paul J. Lanier, in collaboration with Jeffrey M. Jenson and Mark W. Fraser, have carefully crafted this 4th edition to include balanced coverage across areas of poverty, child welfare, education, public health, developmental challenges, substance use, immigration, juvenile justice, and gun violence. This book is an ideal core text for graduate and upper level undergraduate courses and a vital resource for elected officials, policy makers, and others interested in the evolution of policies aimed at preventing problem behaviors and supporting children and families.

Bayesian Data Analysis, Third Edition - Andrew Gelman 2013-11-01

Now in its third edition, this classic book is widely considered the leading text on Bayesian methods, lauded for its accessible, practical approach to analyzing data and solving research problems. *Bayesian Data Analysis, Third Edition* continues to take an applied approach to analysis using up-to-date Bayesian methods. The authors—all leaders in the statistics community—introduce basic concepts from a data-analytic perspective before presenting advanced methods. Throughout the text, numerous worked examples drawn from real applications and research emphasize the use of Bayesian inference in practice. New to the Third Edition Four new chapters on nonparametric modeling Coverage of weakly informative priors and boundary-avoiding priors Updated discussion of cross-validation and predictive information criteria Improved convergence monitoring and effective sample size calculations for iterative simulation Presentations of Hamiltonian Monte Carlo, variational Bayes, and expectation propagation New and revised software code The book can be used in three different ways. For undergraduate students, it introduces Bayesian inference starting from first principles. For graduate students, the text presents effective current approaches to Bayesian modeling and computation in statistics and related fields. For researchers, it provides an assortment of Bayesian methods in applied statistics. Additional materials, including data sets used in the examples, solutions to selected exercises, and software instructions, are available on the book's web page.

Propensity Score Analysis - Wei Pan 2015-03-18

This book is designed to help researchers better design and analyze observational data from quasi-experimental studies and improve the validity of research on causal claims. It provides clear guidance on the use of different propensity score analysis (PSA) methods, from the fundamentals to complex, cutting-edge techniques. Experts in the field introduce underlying concepts and current issues and review relevant software programs for PSA. The book addresses the steps in propensity score estimation, including the use of generalized boosted models, how to identify which matching methods work best with specific types of data, and the evaluation of balance results on key background covariates after matching. Also covered are applications of PSA with complex data, working with missing data, controlling for unobserved confounding, and the extension of PSA to prognostic score analysis for causal inference. User-friendly features include statistical program codes and application examples. Data and software code for the examples are available at the companion website (www.guilford.com/pan-materials).

Causal Inference in Statistics - Madelyn Glymour 2016-01-25

Many of the concepts and terminology surrounding modern causal

inference can be quite intimidating to the novice. Judea Pearl presents a book ideal for beginners in statistics, providing a comprehensive introduction to the field of causality. Examples from classical statistics are presented throughout to demonstrate the need for causality in resolving decision-making dilemmas posed by data. Causal methods are also compared to traditional statistical methods, whilst questions are provided at the end of each section to aid student learning.

Multilevel Modeling Using R - W. Holmes Finch 2019-07-16

Like its bestselling predecessor, *Multilevel Modeling Using R*, Second Edition provides the reader with a helpful guide to conducting multilevel data modeling using the R software environment. After reviewing standard linear models, the authors present the basics of multilevel models and explain how to fit these models using R. They then show how to employ multilevel modeling with longitudinal data and demonstrate the valuable graphical options in R. The book also describes models for categorical dependent variables in both single level and multilevel data. New in the Second Edition: Features the use of lmer (instead of lme) and including the most up to date approaches for obtaining confidence intervals for the model parameters. Discusses measures of R² (the squared multiple correlation coefficient) and overall model fit. Adds a chapter on nonparametric and robust approaches to estimating multilevel models, including rank based, heavy tailed distributions, and the multilevel lasso. Includes a new chapter on multivariate multilevel models. Presents new sections on micro-macro models and multilevel generalized additive models. This thoroughly updated revision gives the reader state-of-the-art tools to launch their own investigations in multilevel modeling and gain insight into their research. About the Authors: W. Holmes Finch is the George and Frances Ball Distinguished Professor of Educational Psychology at Ball State University. Jocelyn E. Bolin is a Professor in the Department of Educational Psychology at Ball State University. Ken Kelley is the Edward F. Sorin Society Professor of IT, Analytics and Operations and the Associate Dean for Faculty and Research for the Mendoza College of Business at the University of Notre Dame.

Practical Propensity Score Methods Using R - Walter Leite 2016-10-28

Practical Propensity Score Methods Using R by Walter Leite is a practical book that uses a step-by-step analysis of realistic examples to help students understand the theory and code for implementing propensity score analysis with the R statistical language. With a comparison of both well-established and cutting-edge propensity score methods, the text highlights where solid guidelines exist to support best practices and where there is scarcity of research. Readers will find that this scaffolded approach to R and the book's free online resources help them apply the text's concepts to the analysis of their own data.

The Reviewer's Guide to Quantitative Methods in the Social Sciences -

Gregory R. Hancock 2010-04-26

Designed for reviewers of research manuscripts and proposals in the social and behavioral sciences, and beyond, this title includes chapters that address traditional and emerging quantitative methods of data analysis.

Structural Equation Modeling - Natasha K. Bowen 2011-09-23

Structural Equation Modeling (SEM) has long been used in social work research, but the writing on the topic is typically fragmented and highly technical. This pocket guide fills a major gap in the literature by providing social work researchers and doctoral students with an accessible synthesis. The authors demonstrate two SEM programs with distinct user interfaces and capabilities (Amos and Mplus) with enough specificity that readers can conduct their own analyses without consulting additional resources. Examples from social work literature highlight best practices for the specification, estimation, interpretation, and modification of structural equation models. Unlike most sources on SEM, this book provides clear guidelines on how to evaluate SEM output and how to proceed when model fit is not acceptable. Oftentimes, confirmatory factor analysis and general structure modeling are the most flexible, powerful, and appropriate choices for social work data. Richly illustrated with figures, equations, matrices, and tables, this pocket guide empowers social workers with a set of defensible analysis strategies that allows for competent, confident use of SEM.

Causal Inference in Statistics, Social, and Biomedical Sciences - Guido W. Imbens 2015-04-06

This text presents statistical methods for studying causal effects and discusses how readers can assess such effects in simple randomized experiments.

Developing a Protocol for Observational Comparative Effectiveness

Research: A User's Guide - Agency for Health Care Research and Quality

(U.S.) 2013-02-21

This User's Guide is a resource for investigators and stakeholders who develop and review observational comparative effectiveness research protocols. It explains how to (1) identify key considerations and best practices for research design; (2) build a protocol based on these standards and best practices; and (3) judge the adequacy and completeness of a protocol. Eleven chapters cover all aspects of research design, including: developing study objectives, defining and refining study questions, addressing the heterogeneity of treatment effect, characterizing exposure, selecting a comparator, defining and measuring outcomes, and identifying optimal data sources. Checklists of guidance and key considerations for protocols are provided at the end of each chapter. The User's Guide was created by researchers affiliated with AHRQ's Effective Health Care Program, particularly those who participated in AHRQ's DECIDE (Developing Evidence to Inform Decisions About Effectiveness) program. Chapters were subject to multiple internal and external independent reviews. More information, please consult the Agency website: www.effectivehealthcare.ahrq.gov

Propensity Score Methods and Applications - Haiyan Bai 2018-11-20

A concise, introductory text, *Propensity Score Methods and Applications* describes propensity score methods (PSM) and how they are used to balance the distributions of observed covariates between treatment conditions as a means to reduce selection bias. This new QASS title specifically focuses on the procedures of implementing PSM for research in social sciences, instead of merely demonstrating the effectiveness of the method. Using succinct and approachable language to introduce the basic concepts of PSM, authors Haiyan Bai and M. H. Clark present basic concepts, assumptions, procedures, available software packages, and step-by-step examples for implementing PSM using real-world data, with exercises at the end of each chapter allowing readers to replicate examples on their own.

Design of Observational Studies - Paul R. Rosenbaum 2009-10-22

An observational study is an empiric investigation of effects caused by treatments when randomized experimentation is unethical or infeasible. Observational studies are common in most fields that study the effects of treatments on people, including medicine, economics, epidemiology, education, psychology, political science and sociology. The quality and strength of evidence provided by an observational study is determined largely by its design. *Design of Observational Studies* is both an introduction to statistical inference in observational studies and a detailed discussion of the principles that guide the design of observational studies. *Design of Observational Studies* is divided into four parts. Chapters 2, 3, and 5 of Part I cover concisely, in about one hundred pages, many of the ideas discussed in Rosenbaum's *Observational Studies* (also published by Springer) but in a less technical fashion. Part II discusses the practical aspects of using propensity scores and other tools to create a matched comparison that balances many covariates. Part II includes a chapter on matching in R. In Part III, the concept of design sensitivity is used to appraise the relative ability of competing designs to distinguish treatment effects from biases due to unmeasured covariates. Part IV discusses planning the analysis of an observational study, with particular reference to Sir Ronald Fisher's striking advice for observational studies, "make your theories elaborate." The second edition of his book, *Observational Studies*, was published by Springer in 2002.

Practical Statistical Methods - Lakshmi Padgett 2011-04-25

Practical Statistical Methods: A SAS Programming Approach presents a broad spectrum of statistical methods useful for researchers without an extensive statistical background. In addition to nonparametric methods, it covers methods for discrete and continuous data. Omitting mathematical details and complicated formulae, the text provides SAS programs to carry out the necessary analyses and draw appropriate inferences for common statistical problems. After introducing fundamental statistical concepts, the author describes methods used for quantitative data and continuous data following normal and nonnormal distributions. She then focuses on regression methodology, highlighting simple linear regression, logistic regression, and the proportional hazards model. The final chapter briefly discusses such miscellaneous topics as propensity scores, misclassification errors, interim analysis, conditional power, bootstrap, and jackknife. With SAS code and output integrated throughout, this book shows how to interpret data using SAS and illustrates the many statistical methods available for tackling problems in a range of fields, including the pharmaceutical industry and the social sciences.

Propensity Score Analysis - Shenyang Guo 2014-06-11

Fully updated to reflect the most recent changes in the field, the Second Edition of Propensity Score Analysis provides an accessible, systematic review of the origins, history, and statistical foundations of propensity score analysis, illustrating how it can be used for solving evaluation and causal-inference problems. With a strong focus on practical applications, the authors explore various strategies for employing PSA, discuss the use of PSA with alternative types of data, and delineate the limitations of PSA under a variety of constraints. Unlike existing textbooks on program evaluation and causal inference, this book delves into statistical concepts, formulas, and models within the context of a robust and engaging focus on application.

Applied Multivariate Statistical Concepts - Debbie L. Hahs-Vaughn 2016-12-01

More comprehensive than other texts, this new book covers the classic and cutting edge multivariate techniques used in today's research. Ideal for courses on multivariate statistics/analysis/design, advanced statistics or quantitative techniques taught in psychology, education, sociology, and business, the book also appeals to researchers with no training in multivariate methods. Through clear writing and engaging pedagogy and examples using real data, Hahs-Vaughn walks students through the most used methods to learn why and how to apply each technique. A conceptual approach with a higher than usual text-to-formula ratio helps reader's master key concepts so they can implement and interpret results generated by today's sophisticated software. Annotated screenshots from SPSS and other packages are integrated throughout. Designed for course flexibility, after the first 4 chapters, instructors can use chapters in any sequence or combination to fit the needs of their students. Each chapter includes a 'mathematical snapshot' that highlights the technical components of each procedure, so only the most crucial equations are included. Highlights include: -Outlines, key concepts, and vignettes related to key concepts preview what's to come in each chapter -Examples using real data from education, psychology, and other social sciences illustrate key concepts -Extensive coverage of assumptions including tables, the effects of their violation, and how to test for each technique -Conceptual, computational, and interpretative problems mirror the real-world problems students encounter in their studies and careers -A focus on data screening and power analysis with attention on the special needs of each particular method -Instructions for using SPSS via screenshots and annotated output along with HLM, Mplus, LISREL, and G*Power where appropriate, to demonstrate how to interpret results -Templates for writing research questions and APA-style write-ups of results which serve as models -Propensity score analysis chapter that demonstrates the use of this increasingly popular technique -A review of matrix algebra for those who want an introduction (prerequisites include an introduction to factorial ANOVA, ANCOVA, and simple linear regression, but knowledge of matrix algebra is not assumed) -www.routledge.com/9780415842365 provides the text's datasets preformatted for use in SPSS and other statistical packages for readers, as well as answers to all chapter problems, Power Points, and test items for instructors

Applied Bayesian Modeling and Causal Inference from Incomplete-Data Perspectives - Andrew Gelman 2004-09-03

This book brings together a collection of articles on statistical methods relating to missing data analysis, including multiple imputation, propensity scores, instrumental variables, and Bayesian inference. Covering new research topics and real-world examples which do not feature in many standard texts. The book is dedicated to Professor Don Rubin (Harvard). Don Rubin has made fundamental contributions to the study of missing data. Key features of the book include: Comprehensive coverage of an important area for both research and applications. Adopts a pragmatic approach to describing a wide range of intermediate and advanced statistical techniques. Covers key topics such as multiple imputation, propensity scores, instrumental variables and Bayesian inference. Includes a number of applications from the social and health sciences. Edited and authored by highly respected researchers in the area.

Research Methods and Methodologies in Education - James Arthur 2012-03-19

'This work will be of immense value to those who are undertaking a significant post-graduate research study in Education. The array of impressive contributors writes in an accessible and clear manner, and brings the attention of the reader to both technical and conceptual terms. This book certainly will be an addition to my own reference library' - Susan Groundwater-Smith, Faculty of Education and Social

Work, University of Sydney This straightforward and jargon-free book will provide students with the theoretical understandings, practical knowledge and skills they need to carry out independent research. The international contributors identify key research methodologies, data collection tools and analysis methods, and focus on the direct comparisons between them. Each chapter sets out the strengths and weaknesses of a key research method by: identifying specific research designs presenting a series of relevant data collection tools highlighting which analytical methods which can be used. The chapters cover the full range of methods and methodologies, including internet research, mixed methods research and the various modes of ethnographic research. Additional online materials are also available including links to useful journal articles enabling further reading and exploration of each chapter. This is a key book for M-level students and other postgraduates within Education and Educational Research Methods courses. James Arthur is Head of School and Professor of Education and Civic Engagement at the University of Birmingham, UK. Michael J. Waring is a Senior Lecturer in the School of Sport, Exercise and Human Sciences at Loughborough University, UK. Robert Coe is Professor in the School of Education and Director of the Centre for Evaluation and Monitoring (CEM), Durham University, UK. Larry V. Hedges (PhD) is Board of Trustees Professor of Statistics and Social Policy, at the Institute for Policy Research, Northwestern University, US.

Survival Analysis - Shenyang Guo 2010-01-25

Survival analysis is a class of statistical methods for studying the occurrence and timing of events. With clearly written summaries and plentiful examples, this pocket guide will put this important statistical tool in the hands of many more social work researchers than have been able to use it before.

Microeconometrics - A. Colin Cameron 2005-05-09

This book provides the most comprehensive treatment to date of microeconometrics, the analysis of individual-level data on the economic behavior of individuals or firms using regression methods for cross section and panel data. The book is oriented to the practitioner. A basic understanding of the linear regression model with matrix algebra is assumed. The text can be used for a microeconometrics course, typically a second-year economics PhD course; for data-oriented applied microeconometrics field courses; and as a reference work for graduate students and applied researchers who wish to fill in gaps in their toolkit. Distinguishing features of the book include emphasis on nonlinear models and robust inference, simulation-based estimation, and problems of complex survey data. The book makes frequent use of numerical examples based on generated data to illustrate the key models and methods. More substantially, it systematically integrates into the text empirical illustrations based on seven large and exceptionally rich data sets.

The Kernel Method of Test Equating - Alina A. von Davier 2003-10-01 KE is applied to the four major equating designs and to both Chain Equating and Post-Stratification Equating for the Non-Equivalent groups with Anchor Test Design. It will be an important reference for several groups: (a) Statisticians (b) Practitioners and (c) Instructors in psychometric and measurement programs. The authors assume some familiarity with linear and equipercenile test equating, and with matrix algebra.

Methods in Comparative Effectiveness Research - Constantine Gatsonis 2017-02-24

Comparative effectiveness research (CER) is the generation and synthesis of evidence that compares the benefits and harms of alternative methods to prevent, diagnose, treat, and monitor a clinical condition or to improve the delivery of care (IOM 2009). CER is conducted to develop evidence that will aid patients, clinicians, purchasers, and health policy makers in making informed decisions at both the individual and population levels. CER encompasses a very broad range of types of studies—experimental, observational, prospective, retrospective, and research synthesis. This volume covers the main areas of quantitative methodology for the design and analysis of CER studies. The volume has four major sections—causal inference; clinical trials; research synthesis; and specialized topics. The audience includes CER methodologists, quantitative-trained researchers interested in CER, and graduate students in statistics, epidemiology, and health services and outcomes research. The book assumes a masters-level course in regression analysis and familiarity with clinical research.

Propensity Score Analysis - Shenyang Guo 2015

Provides readers with a systematic review of the origins, history, and statistical foundations of Propensity Score Analysis (PSA) and illustrates

how it can be used for solving evaluation and causal-inference problems.

Statistics and Causality - Wolfgang Wiedermann 2016-05-12

A one-of-a-kind guide to identifying and dealing with modern statistical developments in causality. Written by a group of well-known experts, *Statistics and Causality: Methods for Applied Empirical Research* focuses on the most up-to-date developments in statistical methods in respect to causality. Illustrating the properties of statistical methods to theories of causality, the book features a summary of the latest developments in methods for statistical analysis of causality hypotheses. The book is divided into five accessible and independent parts. The first part introduces the foundations of causal structures and discusses issues associated with standard mechanistic and difference-making theories of causality. The second part features novel generalizations of methods designed to make statements concerning the direction of effects. The third part illustrates advances in Granger-causality testing and related issues. The fourth part focuses on counterfactual approaches and propensity score analysis. Finally, the fifth part presents designs for causal inference with an overview of the research designs commonly used in epidemiology. *Statistics and Causality: Methods for Applied Empirical Research* also includes: New statistical methodologies and approaches to causal analysis in the context of the continuing development of philosophical theories. End-of-chapter bibliographies that provide references for further discussions and additional research topics. Discussions on the use and applicability of software when appropriate. *Statistics and Causality: Methods for Applied Empirical Research* is an ideal reference for practicing statisticians, applied mathematicians, psychologists, sociologists, logicians, medical professionals, epidemiologists, and educators who want to learn more about new methodologies in causal analysis. The book is also an excellent textbook for graduate-level courses in causality and qualitative logic.

Statistical Methods for Handling Incomplete Data - Jae Kwang Kim 2021-11-19

Due to recent theoretical findings and advances in statistical computing, there has been a rapid development of techniques and applications in the area of missing data analysis. *Statistical Methods for Handling Incomplete Data* covers the most up-to-date statistical theories and computational methods for analyzing incomplete data. Features Uses the mean score equation as a building block for developing the theory for missing data analysis. Provides comprehensive coverage of computational techniques for missing data analysis. Presents a rigorous treatment of imputation techniques, including multiple imputation, fractional imputation. Explores the most recent advances of the propensity score method and estimation techniques for nonignorable missing data. Describes a survey sampling application. Updated with a new chapter on Data Integration. Now includes a chapter on Advanced Topics, including kernel ridge regression, imputation, and neural network model imputation. The book is primarily aimed at researchers and graduate students from statistics, and could be used as a reference by applied researchers with a good quantitative background. It includes many real data examples and simulated examples to help readers understand the methodologies.

Using Propensity Scores in Quasi-Experimental Designs - William M. Holmes 2013-06-10

Using Propensity Scores in Quasi-Experimental Designs, by William M. Holmes, examines how propensity scores can be used to reduce bias with different kinds of quasi-experimental designs and to fix or improve broken experiments. Requiring minimal use of matrix and vector algebra, the book covers the causal assumptions of propensity score estimates and their many uses, linking these uses with analysis appropriate for different designs. Thorough coverage of bias assessment, propensity score estimation, and estimate improvement is provided, along with graphical and statistical methods for this process. Applications are included for analysis of variance and covariance, maximum likelihood

and logistic regression, two-stage least squares, generalized linear regression, and general estimation equations. The examples use public data sets that have policy and programmatic relevance across a variety of disciplines.

Analysis of Observational Health Care Data Using SAS - Douglas E. Faries 2010-01-01

This book guides researchers in performing and presenting high-quality analyses of all kinds of non-randomized studies, including analyses of observational studies, claims database analyses, assessment of registry data, survey data, pharmaco-economic data, and many more applications. The text is sufficiently detailed to provide not only general guidance, but to help the researcher through all of the standard issues that arise in such analyses. Just enough theory is included to allow the reader to understand the pros and cons of alternative approaches and when to use each method. The numerous contributors to this book illustrate, via real-world numerical examples and SAS code, appropriate implementations of alternative methods. The end result is that researchers will learn how to present high-quality and transparent analyses that will lead to fair and objective decisions from observational data.

Statistics Done Wrong - Alex Reinhart 2015-03-01

Scientific progress depends on good research, and good research needs good statistics. But statistical analysis is tricky to get right, even for the best and brightest of us. You'd be surprised how many scientists are doing it wrong. *Statistics Done Wrong* is a pithy, essential guide to statistical blunders in modern science that will show you how to keep your research blunder-free. You'll examine embarrassing errors and omissions in recent research, learn about the misconceptions and scientific politics that allow these mistakes to happen, and begin your quest to reform the way you and your peers do statistics. You'll find advice on: -Asking the right question, designing the right experiment, choosing the right statistical analysis, and sticking to the plan -How to think about p values, significance, insignificance, confidence intervals, and regression -Choosing the right sample size and avoiding false positives -Reporting your analysis and publishing your data and source code -Procedures to follow, precautions to take, and analytical software that can help Scientists: Read this concise, powerful guide to help you produce statistically sound research. Statisticians: Give this book to everyone you know. The first step toward statistics done right is *Statistics Done Wrong*.

Statistics and Machine Learning Methods for EHR Data - Hulin Wu 2020-12-10

The use of Electronic Health Records (EHR)/Electronic Medical Records (EMR) data is becoming more prevalent for research. However, analysis of this type of data has many unique complications due to how they are collected, processed and types of questions that can be answered. This book covers many important topics related to using EHR/EMR data for research including data extraction, cleaning, processing, analysis, inference, and predictions based on many years of practical experience of the authors. The book carefully evaluates and compares the standard statistical models and approaches with those of machine learning and deep learning methods and reports the unbiased comparison results for these methods in predicting clinical outcomes based on the EHR data. Key Features: Written based on hands-on experience of contributors from multidisciplinary EHR research projects, which include methods and approaches from statistics, computing, informatics, data science and clinical/epidemiological domains. Documents the detailed experience on EHR data extraction, cleaning and preparation. Provides a broad view of statistical approaches and machine learning prediction models to deal with the challenges and limitations of EHR data. Considers the complete cycle of EHR data analysis. The use of EHR/EMR analysis requires close collaborations between statisticians, informaticians, data scientists and clinical/epidemiological investigators. This book reflects that multidisciplinary perspective.