

Regression In Meta Analysis Comprehensive Meta Analysis

This book is the first exclusively devoted to the systematic synthesis of diagnostic test accuracy studies. It builds upon the major recent developments in reporting standards, search methods, and, in particular, statistical tools specifically devoted to diagnostic studies. In addition, it borrows extensively from the latest advances in systematic reviews and meta-analyses of intervention studies. After a section dedicated to methods for designing reviews, synthesizing evidence and appraising inconsistency in research, the application of these approaches is demonstrated in the context of case studies from various clinical disciplines. Diagnosis is central in medical decision-making, and in many other fields of human endeavor, such as education and psychology. The plurality of sources of evidence on diagnostic test accuracy poses a huge challenge for practitioners and researchers, as do the multiple dimensions of evidence validity, which include sensitivity, specificity, predictive values, and likelihood ratios. This book offers an invaluable resource for anyone aiming to improve decision-making processes in diagnosis, classification or risk prognostication, from epidemiologists to biostatisticians, radiologists, laboratory physicians and graduate students, as any physician interested in refining his methodological skills in clinical diagnosis.

This collection provides detailed descriptions of both standard and advanced meta-analytic methods and their implementation in Stata. Readers will gain access to the statistical methods behind the rapid increase in the number of meta-analyses reported in the social science and medical literature. The book shows how to conduct and interpret meta-analyses as well as produce highly flexible graphical displays. Using meta-regression, it examines reasons for between-study variability in effect estimates. The book also employs advanced methods for the meta-analysis of diagnostic test accuracy studies, dose-response meta-analysis, meta-analysis with missing data, and multivariate meta-analysis.

Meta-analysis is a powerful statistical methodology for synthesizing research evidence across independent studies. This is the first comprehensive handbook of meta-analysis written specifically for ecologists and evolutionary biologists, and it provides an invaluable introduction for beginners as well as an up-to-date guide for experienced meta-analysts. The chapters, written by renowned experts, walk readers through every step of meta-analysis, from problem formulation to the presentation of the results. The handbook identifies both the advantages of using meta-analysis for research synthesis and the potential pitfalls and limitations of meta-analysis (including when it should not be used). Different approaches to carrying out a meta-analysis are described, and include moment and least-square, maximum likelihood, and Bayesian approaches, all illustrated using worked examples based on real biological datasets. This one-of-a-kind resource is uniquely tailored to the biological sciences, and will provide an invaluable text for practitioners from graduate students and senior scientists to policymakers in conservation and environmental management. Walks you through every step of carrying out a meta-analysis in ecology and evolutionary biology, from problem formulation to result presentation Brings together experts from a broad range of fields Shows how to avoid, minimize, or resolve pitfalls such as missing data, publication bias, varying data quality, nonindependence of observations, and phylogenetic dependencies among species Helps you choose the right software Draws on numerous examples based on real biological datasets

The thoroughly updated second edition of this key textbook provides an authoritative discussion of cardiovascular disease for the practicing primary care clinician. It examines a variety of disease states with emphasis on risk factors, risk estimation, and established cardiac disease. The book also explores the co-morbid conditions that surround cardiovascular disease. It includes key points, algorithms, case studies, recommendations on evidence-based practice, and summary boxes. A key resource for the busy practitioner, the Second Edition of Comprehensive Cardiovascular Medicine in the Primary Care Setting is designed to give residents, fellows, and primary care physicians the skills to confidently perform assessments, initiate and maintain efficacious therapy, and know when a referral to a cardiologist is advisable.

This book provides a clear and thorough introduction to meta-analysis, the process of synthesizing data from a series of separate studies. Meta-analysis has become a critically important tool in fields as diverse as medicine, pharmacology, epidemiology, education, psychology, business, and ecology. Introduction to Meta-Analysis: Outlines the role of meta-analysis in the research process Shows how to compute effects sizes and treatment effects Explains the fixed-effect and random-effects models for synthesizing data Demonstrates how to assess and interpret variation in effect size across studies Clarifies concepts using text and figures, followed by formulas and examples Explains how to avoid common mistakes in meta-analysis Discusses controversies in meta-analysis Features a web site with additional material and exercises A superb combination of lucid prose and informative graphics, written by four of the world's leading experts on all aspects of meta-analysis. Borenstein, Hedges, Higgins, and Rothstein provide a refreshing departure from cookbook approaches with their clear explanations of the what and why of meta-analysis. The book is ideal as a course textbook or for self-study. My students, who used pre-publication versions of some of the chapters, raved about the clarity of the explanations and examples. David Rindskopf, Distinguished Professor of Educational Psychology, City University of New York, Graduate School and University Center, & Editor of the Journal of Educational and Behavioral Statistics. The approach taken by Introduction to Meta-analysis is intended to be primarily conceptual, and it is amazingly successful at achieving that goal. The reader can comfortably skip the formulas and still understand their application and underlying motivation. For the more statistically sophisticated reader, the relevant formulas and worked examples provide a superb practical guide to performing a meta-analysis. The book provides an eclectic mix of examples from education, social science, biomedical studies, and even ecology. For anyone considering leading a course in meta-analysis, or pursuing self-directed study, Introduction to Meta-analysis would be a clear first choice. Jesse A. Berlin, ScD Introduction to Meta-Analysis is an excellent resource for novices and experts alike. The book provides a clear and comprehensive presentation of all basic and most advanced approaches to meta-analysis. This book will be referenced for decades.

Michael A. McDaniel, Professor of Human Resources and Organizational Behavior, Virginia Commonwealth University

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

Increased public awareness of traumatic brain injuries has fueled a number of significant developments: on the one hand, more funding and more research related to these injuries and their resulting deficits; on the other, the possibility of higher stakes in personal injury suits—and more reasons for individuals to feign injury. Expanding both the conceptual and clinical knowledge base on the subject, the Second Edition of *Detection of Malingering during Head Injury Litigation* offers the latest detection tools and techniques for veteran and novice alike. As in its initial incarnation, this practical revision demonstrates how to combine clinical expertise, carefully-gathered data, and the use of actuarial models as well as common sense in making sound evaluations and reducing ambiguous results. And, the book navigates the reader through the many caveats that come with the job, beginning with the scenario that an individual may be malingering despite having an actual brain injury. Among the updated features:

- Specific chapters on malingering on the Halstead-Reitan, Luria-Nebraska, and MMPI-2.
- A framework for distinguishing genuine from factitious PTSD in head injury cases.
- Detailed information regarding performance on the WMT, MSVT, and NV-MSVT by children with developmental disabilities.
- Guidelines for explaining symptom validity testing to the trier of fact.
- Entirely new chapters on mild TBI and on malingering of PTSD symptoms in the context of TBI litigation.

Professional neuropsychologists and forensic psychologists will appreciate this new edition of *Detection of Malingering during Head Injury Litigation* as an invaluable source of refinements to their craft, and improvement as an expert witness.

Maringe ought to be commended for putting together an invaluable contribution to our understanding of research into a complex education system in South Africa. This volume provides a useful foundation to the current state of education quality in South Africa including the impact of interventions. It also brings to the fore challenges still facing education transformation. The evidence presented which, taken together, lays out a coherent view of how improvements could be made. Albert Chanee Head of Planning, Gauteng Department of Education

For too long the weight of educational scholarship produced in South Africa has been limited to that simple and standard form called the literature review. Now, for the first time, education researchers are provided with an African-based text on the concepts and methods of conducting systematic reviews. In this exceptional work of editorship, Felix Maringe brings together some of the leading researchers on South African education to model and demonstrate how to review a significant body of research on a chosen topic which is adjudicated strictly on the basis of the quality and efficacy of the evidence in hand. I have no doubt that this remarkable book will become a standard reference for educational researchers in and beyond the African continent. It will also lift the quality of educational inquiry by equipping a new generation of scholars with the capacity for doing evidence-based research that compels the attention of policymakers, planners and practitioners alike.

Prof Jonathan Jansen Stellenbosch University

Using Mixed Methods Research Synthesis for Literature Reviews by Mieke Heyvaert, Karin Hannes, and Patrick Onghena is a practical guide that provides step-by-step instruction for conducting a mixed methods research synthesis (MMRS) that integrates both qualitative and quantitative evidence. The book progresses through a systematic, comprehensive approach to conducting an MMRS literature review to analyze and summarize the empirical evidence regarding a particular review question. Readers will benefit from discussion of the potential advantages of MMRS and guidance on how to avoid its potential pitfalls. *Using Mixed Methods Research Synthesis for Literature Reviews* is Volume 4 in the SAGE Mixed Methods Research Series.

A practical guide to network meta-analysis with examples and code

In the evaluation of healthcare, rigorous methods of quantitative assessment are necessary to establish which interventions are effective and cost-effective. Often a single study will not provide the answers and it is desirable to synthesise evidence from multiple sources, usually randomised controlled trials. This book takes an approach to evidence synthesis that is specifically intended for decision making when there are two or more treatment alternatives being evaluated, and assumes that the purpose of every synthesis is to answer the question "for this pre-identified population of patients, which treatment is 'best'?" A comprehensive, coherent framework for network meta-analysis (mixed treatment comparisons) is adopted and estimated using Bayesian Markov Chain Monte Carlo methods implemented in the freely available software WinBUGS. Each chapter contains worked examples, exercises, solutions and code that may be adapted by readers to apply to their own analyses. This book can be used as an introduction to evidence synthesis and network meta-analysis, its key properties and policy implications. Examples and advanced methods are also presented for the more experienced reader. Methods used throughout this book can be applied consistently: model critique and checking for evidence consistency are emphasised. Methods are based on technical support documents produced for NICE Decision Support Unit, which support the NICE Methods of Technology Appraisal. Code presented is also the basis for the code used by the ISPOR Task Force on Indirect Comparisons. Includes extensive carefully worked examples, with thorough explanations of how to set out data for use in WinBUGS and how to interpret the output. *Network Meta-Analysis for Decision Making* will be of interest to decision makers, medical statisticians, health economists, and anyone involved in Health Technology Assessment including the pharmaceutical industry.

In pregnancy, maternal nutrition sustains and nourishes the developing child. Imbalances in either the direction of nutritional excess or deficiency can have adverse consequences for child health. In addition, more research now suggests that good pregnancy nutrition influences child health beyond pregnancy and delivery. This includes modifying the risk of child health outcomes as they enter childhood and adulthood through influences on placental development, hormonal pathways, and organ structure and function. Poor pregnancy nutrition may also compromise maternal health during pregnancy, which may have long-term consequences for women's health. Understanding the biological and social mechanisms operating during pregnancy can help in the design of better clinical and public health interventions. This Special Issue on "The Role of Pregnancy Nutrition in Maternal and Offspring Health" includes etiological and mechanistic studies of pregnancy nutrition with short- and long-term maternal and child health outcomes, including original research, narrative reviews, and systematic reviews and meta-analyses. Together, this body of work provides important insights into the influence of dietary patterns, food groups, and nutrients on pregnancy outcomes, and long-term neurodevelopmental, respiratory, and metabolic health in the children. It also highlights nutritional consequences for specific groups of women, including those with pregnancy complications and eating disorders. To provide the tools and knowledge needed in efforts to improve the health of the world's populations, researchers collaborated on the Global Burden of Diseases, Injuries, and Risk Factors Study 2010. The study produced comprehensive estimates of over 200 diseases and health risk factors in 187 countries over two decades, results that will be used by governments and non-governmental agencies to inform priorities for global health research, policies, and funding. *Integrated Meta-Regression Framework for Descriptive Epidemiology* is the first book-length treatment of model-based meta-analytic methods for descriptive epidemiology used in the Global Burden of Disease Study 2010. In addition to collecting the prior work on compartmental modeling of disease, this book significantly extends the model, by formally connecting the system dynamics model of disease progression to a statistical model of epidemiological rates and demonstrates how the two models were combined to allow researchers to integrate relevant data. Practical applications of the model to meta-analysis of more than a dozen different diseases complement the theoretical foundations of the integrative systems modeling of disease in populations. The book concludes with a detailed description of the future directions for research in model-based meta-analysis of descriptive epidemiological data. Abraham Flaxman is assistant professor of global health in the Institute for Health Metrics and Evaluation at the University of Washington. This book provides a comprehensive introduction to performing meta-analysis using the statistical software R. It is intended for quantitative researchers and students in the medical and social sciences who wish to learn how to perform meta-analysis with R. As such, the book introduces the key concepts and models used in meta-analysis. It also includes chapters on the following advanced topics: publication bias and small study effects; missing data; multivariate meta-analysis, network meta-analysis; and meta-analysis of diagnostic studies.

Healthcare providers, consumers, researchers and policy makers are inundated with unmanageable amounts of information, including evidence from healthcare research. It has become impossible for all to have the time and resources to find, appraise and interpret this evidence and incorporate it into healthcare decisions. Cochrane Reviews respond to this challenge by identifying, appraising and synthesizing research-based evidence and presenting it in a standardized format, published in The Cochrane Library (www.thecochranelibrary.com). The Cochrane Handbook for Systematic Reviews of Interventions contains methodological guidance for the preparation and maintenance of Cochrane intervention reviews. Written in a clear and accessible format, it is the essential manual for all those preparing, maintaining and reading Cochrane reviews. Many of the principles and methods described here are appropriate for systematic reviews applied to other types of research and to systematic reviews of interventions undertaken by others. It is hoped therefore that this book will be invaluable to all those who want to understand the role of systematic reviews, critically appraise published reviews or perform reviews themselves.

Covering the most important developments in meta-analysis from 1990 to 2004, this text presents new patterns in research findings as well as updated information on existing topics.

This book offers an up-to-date review on the principles and practice of multidimensional assessment and management of the older individual, which represents the cornerstone of modern clinical practice in the elderly. The early chapters cover the main elements and scope of the comprehensive geriatric approach and explain the pathways of care from screening and case finding through to in-depth assessment and treatment planning. Subsequent chapters review the evidence of how best to apply the multidimensional assessment and management approach in defined healthcare settings and within specific clinical areas, such as cancer and surgery. Finally, the education and training challenges are reviewed and the prospects for future clinical service and research in this important field are examined. The book is very timely given the recent advances in application of this approach, which reflect the growing international realization that older people are "core business" in many clinical areas where the role of specialist geriatric medicine has hitherto been limited. Accordingly, the book will be relevant to a wide range of clinicians. The authorship comprises many of the best known and widely published experts in their respective fields.

The main purpose of this book is to address the statistical issues for integrating independent studies. There exist a number of papers and books that discuss the mechanics of collecting, coding, and preparing data for a meta-analysis, and we do not deal with these. Because this book concerns methodology, the content necessarily is statistical, and at times mathematical. In order to make the material accessible to a wider audience, we have not provided proofs in the text. Where proofs are given, they are placed as commentary at the end of a chapter. These can be omitted at the discretion of the reader. Throughout the book we describe computational procedures whenever required. Many computations can be completed on a hand calculator, whereas some require the use of a standard statistical package such as SAS, SPSS, or BMD. Readers with experience using a statistical package or who conduct analyses such as multiple regression or analysis of variance should be able to carry out the analyses described with the aid of a statistical package.

Doing Meta-Analysis with R: A Hands-On Guide CRC Press

A practical guide to network meta-analysis with examples and code In the evaluation of healthcare, rigorous methods of quantitative assessment are necessary to establish which interventions are effective and cost-effective. Often a single study will not provide the answers and it is desirable to synthesise evidence from multiple sources, usually randomised controlled trials. This book takes an approach to evidence synthesis that is specifically intended for decision making

when there are two or more treatment alternatives being evaluated, and assumes that the purpose of every synthesis is to answer the question “for this pre-identified population of patients, which treatment is ‘best’?” A comprehensive, coherent framework for network meta-analysis (mixed treatment comparisons) is adopted and estimated using Bayesian Markov Chain Monte Carlo methods implemented in the freely available software WinBUGS. Each chapter contains worked examples, exercises, solutions and code that may be adapted by readers to apply to their own analyses. This book can be used as an introduction to evidence synthesis and network meta-analysis, its key properties and policy implications. Examples and advanced methods are also presented for the more experienced reader. Methods used throughout this book can be applied consistently: model critique and checking for evidence consistency are emphasised. Methods are based on technical support documents produced for NICE Decision Support Unit, which support the NICE Methods of Technology Appraisal. Code presented is also the basis for the code used by the ISPOR Task Force on Indirect Comparisons. Includes extensive carefully worked examples, with thorough explanations of how to set out data for use in WinBUGS and how to interpret the output. Network Meta-Analysis for Decision Making will be of interest to decision makers, medical statisticians, health economists, and anyone involved in Health Technology Assessment including the pharmaceutical industry.

Research synthesis is the practice of systematically distilling and integrating data from many studies in order to draw more reliable conclusions about a given research issue. When the first edition of *The Handbook of Research Synthesis and Meta-Analysis* was published in 1994, it quickly became the definitive reference for conducting meta-analyses in both the social and behavioral sciences. In the third edition, editors Harris Cooper, Larry Hedges, and Jeff Valentine present updated versions of classic chapters and add new sections that evaluate cutting-edge developments in the field. *The Handbook of Research Synthesis and Meta-Analysis* draws upon groundbreaking advances that have transformed research synthesis from a narrative craft into an important scientific process in its own right. The editors and leading scholars guide the reader through every stage of the research synthesis process—problem formulation, literature search and evaluation, statistical integration, and report preparation. The Handbook incorporates state-of-the-art techniques from all quantitative synthesis traditions and distills a vast literature to explain the most effective solutions to the problems of quantitative data integration. Among the statistical issues addressed are the synthesis of non-independent data sets, fixed and random effects methods, the performance of sensitivity analyses and model assessments, the development of machine-based abstract screening, the increased use of meta-regression and the problems of missing data. The Handbook also addresses the non-statistical aspects of research synthesis, including searching the literature and developing schemes for gathering information from study reports. Those engaged in research synthesis will find useful advice on how tables, graphs, and narration can foster communication of the results of research syntheses. The third edition of the Handbook provides comprehensive instruction in the skills necessary to conduct research syntheses and represents the premier text on research synthesis. Praise for the first edition: "The Handbook is a comprehensive treatment of literature synthesis and provides practical advice for anyone deep in the throes of, just teetering on the brink of, or attempting to decipher a meta-analysis. Given the expanding application and importance of literature synthesis, understanding both its strengths and weaknesses is essential for its practitioners and consumers. This volume is a good beginning for those who wish to gain that understanding." —Chance "Meta-analysis, as the statistical analysis of a large collection of results from individual studies is called, has now achieved a status of respectability in medicine. This respectability, when combined with the slight hint of mystique that sometimes surrounds meta-analysis, ensures that results of studies that use it are treated with the respect they deserve....The Handbook of Research Synthesis is one of the most important publications in this subject both as a definitive reference book and a practical manual."—British Medical Journal When the first edition of *The Handbook of Research Synthesis* was published in 1994, it quickly became the definitive reference for researchers conducting meta-analyses of existing research in both the social and biological sciences. In this fully revised second edition, editors Harris Cooper, Larry Hedges, and Jeff Valentine present updated versions of the Handbook's classic chapters, as well as entirely new sections reporting on the most recent, cutting-edge developments in the field. Research synthesis is the practice of systematically distilling and integrating data from a variety of sources in order to draw more reliable conclusions about a given question or topic. *The Handbook of Research Synthesis and Meta-Analysis* draws upon years of groundbreaking advances that have transformed research synthesis from a narrative craft into an important scientific process in its own right. Cooper, Hedges, and Valentine have assembled leading authorities in the field to guide the reader through every stage of the research synthesis process—problem formulation, literature search and evaluation, statistical integration, and report preparation. The Handbook of Research Synthesis and Meta-Analysis incorporates state-of-the-art techniques from all quantitative synthesis traditions. Distilling a vast technical literature and many informal sources, the Handbook provides a portfolio of the most effective solutions to the problems of quantitative data integration. Among the statistical issues addressed by the authors are the synthesis of non-independent data sets, fixed and random effects methods, the performance of sensitivity analyses and model assessments, and the problem of missing data. The Handbook of Research Synthesis and Meta-Analysis also provides a rich treatment of the non-statistical aspects of research synthesis. Topics include searching the literature, and developing schemes for gathering information from study reports. Those engaged in research synthesis will also find useful advice on how tables, graphs, and narration can be used to provide the most meaningful communication of the results of research synthesis. In addition, the editors address the potentials and limitations of research synthesis, and its future directions. The past decade has been a period of enormous growth in the field of research synthesis. The second edition Handbook thoroughly revises original chapters to assure that the volume remains the most authoritative source of information for researchers undertaking meta-analysis today. In response to the increasing use of research synthesis in the formation of public policy, the second edition includes a new chapter on both the strengths and limitations of research

synthesis in policy debates

Designed to provide researchers clear and informative insight into techniques of meta-analysis, the Third Edition of *Methods of Meta-Analysis: Correcting Error and Bias in Research Findings* is the most comprehensive text on meta-analysis available today. It is the only book that presents a full and usable treatment of the role of study artifacts in distorting study results, as well as methods for correcting results for such biases and errors. Meta-analysis is arguably the most important methodological innovation in the last thirty-five years, due to its immense impact on the development of cumulative knowledge and professional practice. This text, now in its updated Third Edition, has been revised to cover the newest developments in meta-analysis methods, evaluation, correction, and more. This reader-friendly book is the definitive resource on meta-analysis. "This text is the primary source text for psychometric meta-analysis methods."

—Emily E. Tanner-Smith, Vanderbilt University "The key strength of the book is the complete and thorough coverage of psychometric meta-analysis. This technique is not covered in any other meta-analysis text, and is a major contribution to the literature...The meta-analysis field needs to find ways to integrate Hunter and Schmidt's methods into current meta-analysis practice." —Terri D. Pigott, Loyola University of Chicago "This is an important text. It is the only book that presents adequate coverage of psychometric meta-analysis. In addition to its use as a textbook, it is an invaluable resource for anyone involved in meta-analytic studies." —Steven Pulos, University of Northern Colorado

When used in tandem, systematic reviews and meta-analysis-- two distinct but highly compatible approaches to research synthesis-- form a powerful, scientific approach to analyzing previous studies. But to see their full potential, a social work researcher must be versed in the foundational processes underlying them. This pocket guide to *Systematic Reviews and Meta-Analysis* illuminates precisely that practical groundwork. In clear, step-by-step terms, the authors explain how to format topics, locate and screen studies, extract and assess data, pool effect sizes, determine bias, and interpret the results, showing readers how to combine reviewing and meta-analysis correctly and effectively. Each chapter contains vivid social work examples and concludes with a concise summary and notes on further reading, while the book's glossary and handy checklists and sample search and data extraction forms maximize the book's usefulness. Highlighting the concepts necessary to understand, critique, and conduct research synthesis, this brief and highly readable introduction is a terrific resource for students and researchers alike.

The new edition of the market-leading textbook, covering the latest developments in the rapidly growing field of meta-analysis This book provides a clear and thorough introduction to meta-analysis, the process of synthesizing data from a series of separate studies. The first edition of this text was widely acclaimed for the clarity of the presentation, and quickly established itself as the definitive text in this field. The fully updated second edition includes new and expanded content on avoiding common mistakes in meta-analysis, understanding heterogeneity in effects, publication bias, reporting the Knapp-Hartung Sidik-Jonkman adjustment, and more. Several brand-new chapters provide a systematic "how to" approach to performing and reporting a meta-analysis from start to finish. Written by four of the world's foremost authorities on all aspects of meta-analysis, the new edition of *Introduction to Meta-Analysis: Outlines the role of meta-analysis in the research process Shows how to compute effects sizes and treatment effects Explains the fixed-effect and random-effects models for synthesizing data Demonstrates how to assess and interpret variation in effect size across studies Explains how to avoid common mistakes in meta-analysis Discusses controversies in meta-analysis Includes access to a companion website containing videos, spreadsheets, data files, free software for prediction intervals, and step-by-step instructions for performing analyses using Comprehensive Meta-Analysis (CMA)™*

Offering pragmatic guidance for planning and conducting a meta-analytic review, this book is written in an engaging, nontechnical style that makes it ideal for graduate course use or self-study. The author shows how to identify questions that can be answered using meta-analysis, retrieve both published and unpublished studies, create a coding manual, use traditional and unique effect size indices, and write a meta-analytic review. An ongoing example illustrates meta-analytic techniques. In addition to the fundamentals, the book discusses more advanced topics, such as artifact correction, random- and mixed-effects models, structural equation representations, and multivariate procedures. User-friendly features include annotated equations; discussions of alternative approaches; and "Practical Matters" sections that give advice on topics not often discussed in other books, such as linking meta-analytic results with theory and the utility of meta-analysis software programs. ÿ

Publication bias is the tendency to decide to publish a study based on the results of the study, rather than on the basis of its theoretical or methodological quality. It can arise from selective publication of favorable results, or of statistically significant results. This threatens the validity of conclusions drawn from reviews of published scientific research. Meta-analysis is now used in numerous scientific disciplines, summarizing quantitative evidence from multiple studies. If the literature being synthesised has been affected by publication bias, this in turn biases the meta-analytic results, potentially producing overstated conclusions. *Publication Bias in Meta-Analysis* examines the different types of publication bias, and presents the methods for estimating and reducing publication bias, or eliminating it altogether. Written by leading experts, adopting a practical and multidisciplinary approach. Provides comprehensive coverage of the topic including: Different types of publication bias, Mechanisms that may induce them, Empirical evidence for their existence, Statistical methods to address them, Ways in which they can be avoided. Features worked examples and common data sets throughout. Explains and compares all available software used for analysing and reducing publication bias. Accompanied by a website featuring software, data sets and further material. *Publication Bias in Meta-Analysis* adopts an inter-disciplinary approach and will make an excellent reference volume for any researchers and graduate students who conduct systematic reviews or meta-analyses. University and medical libraries, as well as pharmaceutical companies and government regulatory agencies, will also find this invaluable.

"This book offers readers the best of both worlds: technical sophistication coupled with user-friendly, practical information for doing meta-analysis." -- Page 4 of cover.

Meta-analysis is the application of statistics to combine results from multiple studies and draw appropriate inferences. Its use and

importance have exploded over the last 25 years as the need for a robust evidence base has become clear in many scientific areas, including medicine and health, social sciences, education, psychology, ecology, and economics. Recent years have seen an explosion of methods for handling complexities in meta-analysis, including explained and unexplained heterogeneity between studies, publication bias, and sparse data. At the same time, meta-analysis has been extended beyond simple two-group comparisons of continuous and binary outcomes to comparing and ranking the outcomes from multiple groups, to complex observational studies, to assessing heterogeneity of effects, and to survival and multivariate outcomes. Many of these methods are statistically complex and are tailored to specific types of data. Key features

- Rigorous coverage of the full range of current statistical methodology used in meta-analysis
- Comprehensive, coherent, and unified overview of the statistical foundations behind meta-analysis
- Detailed description of the primary methods for both univariate and multivariate data
- Computer code to reproduce examples in chapters
- Thorough review of the literature with thousands of references
- Applications to specific types of biomedical and social science data

This book is for a broad audience of graduate students, researchers, and practitioners interested in the theory and application of statistical methods for meta-analysis. It is written at the level of graduate courses in statistics, but will be of interest to and readable for quantitative scientists from a range of disciplines. The book can be used as a graduate level textbook, as a general reference for methods, or as an introduction to specialized topics using state-of-the-art methods.

The second edition of this best-selling book has been thoroughly revised and expanded to reflect the significant changes and advances made in systematic reviewing. New features include discussion on the rationale, meta-analyses of prognostic and diagnostic studies and software, and the use of systematic reviews in practice.

This book describes multivariate analyses for several indices commonly used in meta-analysis, outlines how to do power analysis for meta-analysis, and examines issues around research quality and research design and their roles in synthesis.

This is the third edition of a very successful book that originally emerged from the work of a committee set up by the European Society of Urogenital Radiology in 1994 to consider the safety of contrast media used for diagnostic imaging. The new edition not only fully updates the previous edition, but also includes new chapters on complex topics such as pediatric issues and practical aspects of off-label contrast media use. Comprehensive consideration is given to the many different safety issues relating to iodine-based contrast media, gadolinium-based contrast media, microbubbles for ultrasound, and barium sulfate. The text includes chapters on both acute and delayed non-renal adverse reactions and on renal adverse reactions. All of the questions frequently raised in radiological practice are addressed. This book, presented in a handy, easy-to-use format, provides an invaluable, unique, and unparalleled source of information.

This book, first published in 2007, is for the applied researcher performing data analysis using linear and nonlinear regression and multilevel models.

Presents a novel approach to conducting meta-analysis using structural equation modeling. Structural equation modeling (SEM) and meta-analysis are two powerful statistical methods in the educational, social, behavioral, and medical sciences. They are often treated as two unrelated topics in the literature. This book presents a unified framework on analyzing meta-analytic data within the SEM framework, and illustrates how to conduct meta-analysis using the metaSEM package in the R statistical environment. *Meta-Analysis: A Structural Equation Modeling Approach* begins by introducing the importance of SEM and meta-analysis in answering research questions. Key ideas in meta-analysis and SEM are briefly reviewed, and various meta-analytic models are then introduced and linked to the SEM framework. Fixed-, random-, and mixed-effects models in univariate and multivariate meta-analyses, three-level meta-analysis, and meta-analytic structural equation modeling, are introduced. Advanced topics, such as using restricted maximum likelihood estimation method and handling missing covariates, are also covered. Readers will learn a single framework to apply both meta-analysis and SEM. Examples in R and in Mplus are included. This book will be a valuable resource for statistical and academic researchers and graduate students carrying out meta-analyses, and will also be useful to researchers and statisticians using SEM in biostatistics. Basic knowledge of either SEM or meta-analysis will be helpful in understanding the materials in this book.

Review of the First Edition: The authors strive to reduce theory to a minimum, which makes it a self-learning text that is comprehensible for biologists, physicians, etc. who lack an advanced mathematics background. Unlike in many other textbooks, R is not introduced with meaningless toy examples; instead the reader is taken by the hand and shown around some analyses, graphics, and simulations directly relating to meta-analysis... A useful hands-on guide for practitioners who want to familiarize themselves with the fundamentals of meta-analysis and get started without having to plough through theorems and proofs. —*Journal of Applied Statistics*

Statistical Meta-Analysis with R and Stata, Second Edition provides a thorough presentation of statistical meta-analyses (MA) with step-by-step implementations using R/Stata. The authors develop analysis step by step using appropriate R/Stata functions, which enables readers to gain an understanding of meta-analysis methods and R/Stata implementation so that they can use these two popular software packages to analyze their own meta-data. Each chapter gives examples of real studies compiled from the literature. After presenting the data and necessary background for understanding the applications, various methods for analyzing meta-data are introduced. The authors then develop analysis code using the appropriate R/Stata packages and functions.

What's New in the Second Edition: Adds Stata programs along with the R programs for meta-analysis

- Updates all the statistical meta-analyses with R/Stata programs
- Covers fixed-effects and random-effects MA, meta-regression, MA with rare-event, and MA-IPD vs MA-SS
- Adds five new chapters on multivariate MA, publication bias, missing data in MA, MA in evaluating diagnostic accuracy, and network MA

Suitable as a graduate-level text for a meta-data analysis course, the book is also a valuable reference for practitioners and biostatisticians (even those with little or no experience in using R or Stata) in public health, medical research, governmental agencies, and the pharmaceutical industry.

This thesis treats the theory of Mancur Olson on the relationship between interest groups and growth and the empirical analyses regarding its validation. Mancur Olson has developed a comprehensive theory of economic growth that grounds on his 1965 published book *The Logic of Collective Action*. Herein the mechanisms and dynamics of interest groups and collective action are elaborated and discussed. The subsequent complex theory of economic growth presented in *The Rise and Decline of Nations* (1982) shows the impact of the prevailing constellation of interest groups in a country on its economic prospects. The book led to widespread discourse and criticism and its conclusions were analyzed multiple times with econometric methods. However, the research presents divergent results as to whether Olson's theory can be validated or not. The thesis gives an overview of Olson's theories and then discusses the criticism raised by other authors and own considerations. A meta-regression analysis is performed to synthesize the diverging results of various studies. Meta-regression analysis is a relatively new concept in economics. Its objective is to look at econometric evidence from a meta perspective and to use regression tools to find out if study characteristics exert an influence on the findings. It filters out the biases and allows a more objective view. The analysis is carried out on two levels: on the macro level using study characteristics and descriptive statistics and on the micro level using single regression results in a binary logistics model. The results allow a more differentiated look on Olson's theory and its tests. It is suggested that

the theory is too comprehensive and complex to be covered by econometric methods. Therefore, any proper testing should include an examination of convoluting institutional aspects.

Praise for *Meta-Analysis for Public Management and Policy* "In his usual rigorous but readable style, Evan Ringquist and co-author Mary Anderson have produced a tour-de-force on the topic of meta-analysis in public policy and management research. Meta-analysis is badly needed in the all-too-common situation when researchers have low confidence in summarizing the overall results of dozens of studies on the effectiveness of some policy. This book has a nice combination of conceptual overview, methodological details, and applications that will make it possible for researchers to conduct their own meta-analysis. It is tempting to require all graduate students to write a meta-analysis as a chapter in their dissertation, or include meta-analysis as a standard offering in the research methods curriculum of social science graduate programs. The more people that adopt Ringquist and Anderson's approach, the less resources will be wasted on conducting studies that do not contribute to cumulative scientific knowledge." —Mark Lubell Department of Environmental Science and Policy Director, Center for Environmental Policy and Behavior University of California-Davis "Ringquist and his colleagues deliver value and add to canon of public management methods by delivering an analytical framework that makes the case for systematic research using the tools of meta-analysis. This book will be a must read for all committed to strengthening evidence-based research that improves public policy and management decision making." —David M. Van Slyke The Maxwell School of Citizenship and Public Affairs Syracuse University "In *Meta-Analysis for Public Management and Policy* Evan Ringquist and his colleagues provide a lucid and practical roadmap for policy and public management scholars who use meta-analysis in their research. But this is more than a "how to" volume; it provides background on why meta-analysis is a potent means for accumulating and synthesizing empirical research findings, and shows how its use has evolved in recent decades. Specific applications of meta-analysis to long-standing policy and management debates are given, essentially providing an array of developed "templates" through which scholars and practitioners can assess how to approach different kinds of analytical problems using meta-analysis. Particularly valuable to me is the careful development and presentation of the necessary stages of meta-analysis, from conceptualization through data coding and bias assessment to advanced modeling. All of the statistical analyses can be conducted in Stata, utilizing readily available ".ado" modules. I will use this book, both in research and in the classroom. Overall it is one of the most useful methodological contributions I've seen in some time." —Hank Jenkins-Smith Department of Political Science Director, Center for Applied Social Research University of Oklahoma "Meta-Analysis for Public Management and Policy conveys the considerable untapped potential of meta-analysis to strengthen and advance bodies of knowledge and evidence in public management and policy. This book takes students and researchers deep into the methods of meta-analysis and details of their empirical application, without losing sight of the important policy questions and the implications of choices that researchers make in their empirical work for the production of evidence for public managers and policymakers. This book will serve as an excellent practical guide for those conducting their first meta-analysis, while at the same time supporting critically-focused consumption of existing meta-analyses and discussion of where the field can gainfully take this approach to enhance our research and knowledge bases. It draws in a range of valuable and important examples of applications of meta-analysis techniques throughout the book and rounds off with four full-fledged applications of the method. Although the book reaches out to an audience of public management and policy researchers and consumers of this research, it should be of interest to a broad range of applied social science researchers and students as well." —Carolyn Heinrich Sid Richardson Professor of Public Affairs Director, Center for Health and Social Policy LBJ School of Public Affairs University of Texas – Austin "Even for incredibly specialized techniques, public management and policy scholars have a multiplicity of methods texts from which to choose. Yet it is truly surprising that a strong guide to applied meta-analysis — a rigorous framework for the organization of empirical findings — has not been available. Ringquist and Anderson provided just that with an accessible guide to sophisticated techniques. Marrying an instructive text to a set of exemplary standalone studies, *Meta-Analysis for Public Management and Policy* offers unparalleled guidance for instructors and students and more than a little wisdom for seasoned scholars. It is destined to become the standard reference for our field." —Anthony Michael Bertelli CC Crawford Chair in Management and Performance USC Price School of Public Policy USC Gould School of Law University of Southern California "This comprehensive treatment of meta-analysis is an excellent guide for scholars and students in public management and public policy. The carefully done exposition demonstrates why meta-analysis should have greater use in the profession." —Kenneth J. Meier Charles H. Gregory Chair in Liberal Arts Department of Political Science Texas A&M University "This remarkable book reviews the history of the use of meta-analysis in the social sciences, argues forcefully for its importance, value, and relevance for public managers, and provides one-stop-shopping for those who want to learn how to do it or understand how others have done it. The detailed coverage of each step in the process allows a student to learn the technique completely while fully understanding the logic and intellectual goals of the enterprise. Most importantly, the authors review techniques from a range of disciplines, drawing most of their positive suggestions from the field of medical statistics rather than the social sciences. The examples and applications, on the other hand, stem from the world of government and public policy. Four chapters provide new syntheses of research on individual policies using the techniques and practices introduced in the earlier chapters. The result is original research, a strong argument for the value of meta-analysis in a field (political science and public administration) that uses it little, and a complete tool-kit for those who would want to apply these powerful ideas on their own. A very impressive and useful text." —Frank R. Baumgartner Richard J. Richardson Distinguished Professor Department of Political Science University of North Carolina at Chapel Hill "Meta-analysis is a valuable tool for accumulating knowledge about how management matters from across a range of policy areas and disciplines. It is also an underused tool, in large part because of the lack of a comprehensive and useable guide on the topic. Ringquist remedies this problem by offering clear instruction on how to apply the technique wisely, as well as highly useful empirical demonstrations. The field of public management needs this excellent book." —Donald Moynihan Professor of Public Affairs University of Wisconsin-Madison "Professors and students frequently face decisions about how deeply to invest in a statistical procedure, a new technology, a new theory, or some other development in their discipline. The authors of *Meta-Analysis for Public Management and Policy* support such a decision about meta-analysis by making a convincing case for its value and increasing utilization, including such steps as a careful consideration of criticisms of the method. Evan Ringquist then provides clearly, engagingly written chapters on the major concepts, procedures, and issues in the techniques of meta-analysis. His coauthors then provide effectively-presented examples of meta-analytic studies about such topics as school voucher effectiveness, public service motivation and performance, and public sector performance management. The accessible and reader-friendly explanations, coupled with the illustrative examples that walk the reader through how to do it, make this a distinctively effective methodological text. In so doing, it offers a distinctively valuable resource for those of us who want to learn more about this important statistical method." —Hal Rainey Alumni Foundation Distinguished Professor Department of Public Administration and Policy University of Georgia "James Heckman's Nobel lecture described the combined influence of micro surveys, advances in computers and software, and the development and dissemination of multivariate statistical methods on applied economic research. His comments apply equally well to empirical research throughout the social sciences. These forces have created a "flood of numbers" and advances in technology since he wrote about them have assured that the process is accelerating. We need to transform the ways we learn from empirical analyses and create a science for the analysis of the secondary data from applied statistical and econometric models. This science would include methods for summarizing what has been learned from estimates and tests. It would provide methods for diagnostic screening of results to gauge the importance of modeling assumptions and the types of primary data for the findings being reported. Finally, it may well lead to the development of meta-models—integrating findings intended to describe a single system but viewed through distinctive empirical lenses. Meta-analysis is a method that takes an important step

in developing this science. It is a collection of methods that is a product of the transformation in applied research in the past half century. Initially much of this research was the domain of social scientists working on the evaluation of educational interventions. In these applications the primary data from different studies were routinely available, but the outcome and control variables differed across studies. As a result, the focus for these meta-analyses was on data combination with multiple, distinctive measures for a set of latent variables associated with the hypothesized underlying process. The texts describing meta-analysis focused on these situations. As applications of meta-analysis expanded to economics, political science, and sociology, the data structures changed. The new data came from empirical models—as estimated parameters or summaries of test results. The challenges posed in developing these types of data and understanding what they reveal were distinctly different. A text developed by scholars who appreciate how these types of summaries are different was missing until Ringquist and Anderson's *Meta Analysis for Public Management and Policy*. Explaining a process that blends the best of qualitative and quantitative research is a challenge. This book has met this challenge and delivered researchers a great platform for teaching these methods to their students and for updating their own skills. At least four features distinguish this book: 1. The authors display a clear understanding of the strengths and the weaknesses of meta-analysis. Their treatment describes how care in data construction, variable coding, relevant statistical methods and, especially, careful attention to interpreting the findings from a meta-analysis can reinforce the strengths and mitigate the weaknesses. 2. There are real examples presented throughout the book along with a genuine understanding of the importance of the details in developing meta-analyses. 3. The coverage of relevant statistical methods is comprehensive and clear. And 4. The Appendices offer the detail researchers need to see in order to genuinely learn how to use meta-analytic methods. It should be in the library of every serious teacher or practitioner—V. Kerry Smith Regents Professor and W.P. Carey Professor Department of Economics Arizona State University “There are several texts for meta-analysis available, most notably “*The Handbook of Research Synthesis and Meta-Analysis*” by Cooper, Hedges and Valentine, but none specifically directed to public administration and policy scholars. In fact the points of emphasis and examples make the existing texts both difficult and poorly suited for the applied social sciences. Ringquist's book is a spectacular success in filling this lacuna. Ringquist provides a clearer encapsulation of “the basics” in its opening section, and the “basics” are tailored to “problem-oriented” policy sciences (noting for instance, that meta-analyses in public management and policy will almost always use random-effects over fixed-effects). The empirical examples woven throughout as well as the actual analyses on PSM and school vouchers are exceptionally useful in identifying the stages of the process. At the same time, the book doesn't spare the gritty details of confronting commonly required procedures, like bootstrapping and dealing with clustered robust SE, hierarchical modeling, etc. For readers with no exposure to meta-analysis, the text eases the transition by offering a refresher on how statistical techniques are used in original research, then how they differ when used in meta-analysis. Ringquist offers guidelines for syntheses, formulating problems, data evaluation, turning studies into data, techniques in meta-analysis, “the language of meta-analysis”, coding strategies and publication bias. The author also notes that the context and even techniques of meta-analysis are different for public management and public policy compared with medicine and psychology, and education. Public administration and policy analysis provide great opportunities for meta-analysis, but these fields also present considerable challenge. Great care is needed in synthesizing differently designed studies, which are observational and quasi-experimental or correlational designs, because the statistics of meta-analysis were originally developed to synthesize results from experiment design. Measurement issues are tricky because authentic scales are used less frequently than in psychology or medical research. In addition PA and policy as fields of scholarship are diverse and eclectic in research design which makes comparison of parameter estimates exceedingly difficult. Ringquist adroitly compiles an approach to meta-analysis adapted to reflect this context. While Section 1 consists of seven chapters, which discuss techniques of meta-analysis, Section 2 including Chapters 8, 9, 10 and 11 illustrates actual studies using meta-analysis conducted in public management and policy research: evaluating the effectiveness of educational vouchers, performance management in public sector, the effects of federal poverty deconcentration efforts on economic self-sufficiency and problematic behaviors, and the relationship between public service motivation and performance. The book is an easier read than other texts in it guides from project inception through lit review and analysis in a manner tailored to policy and management, and it actually provides a much more accessible and thorough coverage of many of the basic building blocks, random effects, r-based effect sizes, and bootstrapping, making it far more indispensable for any PA meta-analysis. The check-lists for coding articles are especially useful. Provision of Stata commands and practical data management suggestions (creating a command file for data set transformations, for instance) is a great advantage for this text. Adding an addendum with R programming options, in the next edition might be helpful too. The conclusion both compelling and concise but I would like to have seen some of the arguments presented here at the beginning of the book, reserving the conclusion for a fuller encapsulation of what the overall strategy of the book accomplishes in stages – rebutting criticisms that meta-analysis in social science is a waste of time because study estimates are non-comparable and effect sizes non-independent with careful examination of research design and models. This book is essential reading for any scholar in public administration and policy considering undertaking meta-analysis. I expect it will gain many readers in other social science disciplines as well. For serious users of meta-analysis Ringquist's book will not be the only one on the shelf, but it is a valuable addition.” —Richard Feiock Augustus B. Turnbull Professor Askew School of Public Administration and Policy Florida State University

With ever-rising healthcare costs, evidence generation through Health Economics and Outcomes Research (HEOR) plays an increasingly important role in decision-making about the allocation of resources. Accordingly, it is now customary for health technology assessment and reimbursement agencies to request for HEOR evidence, in addition to data from clinical trials, to inform decisions about patient access to new treatment options. While there is a great deal of literature on HEOR, there is a need for a volume that presents a coherent and unified review of the major issues that arise in application, especially from a statistical perspective. *Statistical Topics in Health Economics and Outcomes Research* fulfills that need by presenting an overview of the key analytical issues and best practice. Special attention is paid to key assumptions and other salient features of statistical methods customarily used in the area, and appropriate and relatively comprehensive references are made to emerging trends. The content of the book is purposefully designed to be accessible to readers with basic quantitative backgrounds, while providing an in-depth coverage of relatively complex statistical issues. The book will make a very useful reference for researchers in the pharmaceutical industry, academia, and research institutions involved with HEOR studies. The targeted readers may include statisticians, data scientists, epidemiologists, outcomes researchers, health economists, and healthcare policy and decision-makers. The book provides a comprehensive guide to conducting systematic reviews of empirical economics and business research, identifying and explaining the best practices of MRA, and highlighting its problems and pitfalls. Doucouliagos from Deakin.

Among the thousands of meta-analyses that have been published over the past several decades, there are a number of mistakes that appear on a fairly regular basis. This book outlines the most common mistakes, using examples in medicine, epidemiology, education, psychology, criminal justice, and other fields. For each, it explains why it is a mistake, the implications of the mistake, and how to correct the mistake. The book is intended primarily for researchers, and so the discussion is conceptual rather than statistical. The examples show the real-world consequences of the mistakes, explaining (for example) how the mistakes can lead to the adoption of interventions that may actually be harmful in some populations. The book includes a section with examples that show how to report the results of an analysis correctly. These examples can serve as templates for reporting an analysis, while avoiding the mistakes discussed in earlier chapters. The book's author is the co-author of the text *Introduction to Meta-Analysis*, the best-selling text in this field. In the current volume he draws on his experience teaching meta-analysis to thousands of researchers as well as his experience as a reviewer of meta-analyses for numerous journals.