is meta analysis quantitative

Is Meta-Analysis Quantitative? Unpacking the Methodology and Its Applications

Introduction:

Are you grappling with the nuances of research methodologies? Confused about whether meta-analysis is a quantitative approach or something else entirely? This comprehensive guide delves into the heart of meta-analysis, clarifying its quantitative nature, exploring its applications, and highlighting its crucial role in evidence-based decision-making. We'll move beyond simple definitions to uncover the intricate workings of this powerful research technique, equipping you with the knowledge to understand and critically evaluate meta-analyses you encounter in your field. By the end of this post, you'll not only understand that meta-analysis is quantitative but also grasp its underlying statistical principles and practical applications across diverse disciplines.

What is Meta-Analysis? A Quantitative Approach to Research Synthesis

Meta-analysis, at its core, is a quantitative research method used to systematically synthesize the results of multiple independent studies addressing a specific research question. Unlike narrative reviews which offer a more subjective overview, meta-analysis employs statistical techniques to combine data from these studies, providing a more precise and robust estimate of the overall effect size. This means it doesn't just summarize findings; it statistically combines them to arrive at a single, more powerful conclusion. This quantitative approach allows for a higher level of confidence in the conclusions drawn, compared to relying on individual studies that may have limitations in sample size or statistical power.

Key Characteristics of Meta-Analysis as a Quantitative Method:

Statistical Pooling: The fundamental characteristic distinguishing meta-analysis is its use of statistical methods to pool data from multiple studies. This involves calculating effect sizes (e.g., odds ratios, risk ratios, mean differences) for each individual study and then combining these effect sizes using weighted averages. The weighting often considers factors like sample size and study quality.

Objectivity and Transparency: Unlike narrative reviews, meta-analysis strives for objectivity. The methods used to identify, select, and analyze studies are clearly documented, allowing for replication and scrutiny. This transparency enhances the credibility and reliability of the findings.

Increased Statistical Power: By combining data from multiple studies, meta-analysis increases the overall statistical power compared to individual studies. This allows for the detection of smaller, but still meaningful, effects that might be missed in individual studies due to limited sample sizes.

Identification of Heterogeneity: Meta-analysis not only pools data but also assesses the consistency (or heterogeneity) of findings across studies. Significant heterogeneity indicates substantial variability in the effects observed across the included studies, requiring further investigation to understand the reasons for this variability (e.g., differences in study populations, interventions, or

methodologies).

Addressing Publication Bias: Meta-analysis can, through specific statistical techniques, attempt to identify and address publication bias, a potential systematic error where studies with positive or statistically significant results are more likely to be published than those with negative or non-significant results. This bias can skew the overall findings if not accounted for.

Types of Data Used in Meta-Analysis:

Meta-analysis can accommodate various types of data, depending on the research question and the nature of the included studies. Common data types include:

Dichotomous data: Data representing the presence or absence of an outcome (e.g., success or failure, presence or absence of a disease). Odds ratios and risk ratios are commonly used effect sizes.

Continuous data: Data measured on a continuous scale (e.g., blood pressure, weight, test scores). Mean differences or standardized mean differences are commonly used effect sizes.

Counts data: Data representing the number of events occurring within a specific time period or group (e.g., number of infections, number of deaths). Rate ratios or incidence rate ratios are often used.

Steps Involved in Conducting a Meta-Analysis:

A well-conducted meta-analysis follows a rigorous process that involves several key steps:

1. Formulating a Research Question: Clearly defining the research question is crucial to guide the entire process.

1. Developing an Inclusion/Exclusion Criteria: Establishing precise criteria for selecting studies ensures that only relevant studies are included in the analysis.

1. Searching for Relevant Studies: A comprehensive search of relevant databases and other sources is essential to identify all eligible studies.

1. Data Extraction: Extracting relevant data from the selected studies, including effect sizes and other relevant information, is a critical step.

1. Assessing Risk of Bias: Evaluating the methodological quality of the included studies helps to assess the potential for bias in the results.

1. Statistical Analysis: Performing statistical analysis to pool the data and estimate the overall effect size, assess heterogeneity, and explore potential sources of variability.

1. Interpretation and Reporting: Interpreting the results in the context of the research question and reporting the findings clearly and transparently.

Applications of Meta-Analysis:

Meta-analysis has wide-ranging applications across various disciplines, including:

Medicine and Healthcare: Evaluating the effectiveness of medical interventions, assessing the risk factors for diseases, and understanding treatment outcomes.

Education: Investigating the effectiveness of educational interventions, assessing the impact of different teaching methods, and studying student learning outcomes.

Psychology: Examining the effectiveness of psychological interventions, investigating the determinants of behavior, and studying the relationship between psychological variables.

Environmental Science: Assessing the impact of environmental factors on human health, investigating the effectiveness of environmental policies, and studying the effects of pollution.

Sample Meta-Analysis Outline:

Title: The Effectiveness of Cognitive Behavioral Therapy for Generalized Anxiety Disorder: A Meta-Analysis

Introduction: Background on Generalized Anxiety Disorder (GAD), previous research on CBT effectiveness, and the rationale for a meta-analysis.
Methods: Search strategy, inclusion/exclusion criteria, data extraction methods, assessment of risk of bias, statistical methods used.
Results: Summary of included studies, forest plot showing effect sizes, assessment of heterogeneity, investigation of publication bias, subgroup analyses (if any).
Discussion: Interpretation of the findings, limitations of the study, implications for clinical practice, future research directions.
Conclusion: Summary of the key findings and their implications.

Detailed Explanation of the Outline:

Each section of the outline would contain detailed information related to its heading. For instance:

Introduction: This section would provide a thorough review of the existing literature on GAD and CBT, highlighting the inconsistencies or gaps in the existing evidence that necessitate a meta-analytic approach. It would articulate the specific research question being addressed and the overall objectives of the meta-analysis.

Methods: This is a crucial section where the methodology is clearly described. It would detail the databases searched, search terms used, inclusion/exclusion criteria (e.g., study design, population characteristics, intervention type), data extraction procedures (specifying exactly what data points were collected from each study), methods for assessing risk of bias (e.g., using standardized tools like the Cochrane risk of bias tool), and the statistical methods employed for pooling the data and assessing heterogeneity (e.g., random-effects model, I^2 statistic).

Results: This section would present the key findings of the meta-analysis. It would typically include a summary of the characteristics of the included studies (number of studies, sample sizes, study quality), a forest plot visually representing the effect sizes of individual studies and the pooled effect size, the results of heterogeneity tests (e.g., I^2 statistic), and results regarding the assessment of publication bias (e.g., funnel plot analysis). Subgroup analyses, if conducted, would also be reported here to examine if the effect of CBT varies based on factors such as patient characteristics or treatment parameters.

Discussion: This section would interpret the results within the context of existing literature. It would discuss the limitations of the meta-analysis (e.g., limitations of included studies, potential biases not fully addressed, heterogeneity of results), the implications of the findings for clinical practice and future research, and potential explanations for any observed heterogeneity or unexpected findings.

Conclusion: This section would concisely summarize the key findings and their implications. It would reiterate the main conclusions drawn from the meta-analysis and emphasize the significance of the results for informing clinical practice or future research efforts.

FAQs:

1. Is a meta-analysis always quantitative? Yes, by definition, a meta-analysis is always a quantitative method that involves statistical analysis of pooled data.

1. What are the limitations of meta-analysis? Limitations include reliance on the quality of included studies, potential for publication bias, and difficulties in handling heterogeneity.

1. Can meta-analysis be used with qualitative studies? No, traditional meta-analysis focuses on quantitative data. However, methods like meta-ethnography exist for synthesizing qualitative research.

1. How is heterogeneity assessed in meta-analysis? Heterogeneity is assessed using statistical tests (e.g., Cochran's Q test, I^2 statistic) that measure the variability of effect sizes across studies.

1. What is publication bias, and how is it addressed? Publication bias is the tendency to publish studies with positive results. Funnel plot analysis and statistical techniques like trim-and-fill can help assess and address it.

1. What software is used for meta-analysis? Several software packages, including RevMan, CMA, and STATA, are commonly used.

1. What is the difference between a systematic review and a meta-analysis? A systematic review is a comprehensive, unbiased summary of existing research. A meta-analysis is a statistical synthesis of data from multiple studies within a systematic review.

1. Can meta-analysis prove causality? No, meta-analysis, like observational studies, cannot definitively prove causality. It can, however, strengthen the evidence for an association.

1. How do I critically appraise a meta-analysis? Assess the research question, methods (search strategy, inclusion/exclusion criteria, risk of bias assessment, statistical methods), results, and conclusions. Check for transparency and potential biases.

Related Articles:

1. Systematic Review Methodology: A step-by-step guide to conducting a systematic review.
2. Understanding Effect Sizes: Explanation of different effect size measures and their interpretation.
3. Assessing Risk of Bias in Studies: Methods for evaluating the methodological quality of research.

4. Heterogeneity in Meta-Analysis: Dealing with inconsistencies in study results.
5. Publication Bias in Research: Identifying and addressing publication bias.
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is meta analysis quantitative: Modern Methods of Clinical Investigation Institute of Medicine, Committee on Technological Innovation in Medicine, 1990-02-01 The very rapid pace of advances in biomedical research promises us a wide range of new drugs, medical devices, and clinical procedures. The extent to which these discoveries will benefit the public, however, depends in large part on the methods we choose for developing and testing them. Modern Methods of Clinical Investigation focuses on strategies for clinical evaluation and their role in uncovering the actual benefits and risks of medical innovation. Essays explore differences in our current systems for evaluating drugs, medical devices, and clinical procedures; health insurance databases as a tool for assessing treatment outcomes; the role of the medical profession, the Food and Drug Administration, and industry in stimulating the use of evaluative methods; and more. This book will be of special interest to policymakers, regulators, executives in the medical industry, clinical researchers, and physicians.

is meta analysis quantitative: Meta-Analysis Fredric M. Wolf, Fredric Marc Wolf, 1986-04 Meta-Analysis shows concisely, yet comprehensively, how to apply statistical methods to achieve a literature review of a common research domain. It demonstrates the use of combined tests and measures of effect size to synthesize quantitatively the results of independent studies for both group differences and correlations. Strengths and weaknesses of alternative approaches, as well as of meta-analysis in general, are presented.

is meta analysis quantitative: Cochrane Handbook for Systematic Reviews of Interventions Julian P. T. Higgins, Sally Green, 2008-11-24 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.

is meta analysis quantitative: *Statistical Methods for Meta-Analysis* Larry V. Hedges, Ingram

Olkin, 2014-06-28 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.

is meta analysis quantitative: Meta-Study of Qualitative Health Research Barbara L. Paterson, 2001-06 This title provides step-by-step directions for how to conduct a meta-study, as well as recommendations for tools and standards for the application of this approach.

is meta analysis quantitative: Advances in Meta-Analysis Terri Pigott, 2012-01-31 The subject of the book is advanced statistical analyses for quantitative research synthesis (meta-analysis), and selected practical issues relating to research synthesis that are not covered in detail in the many existing introductory books on research synthesis (or meta-analysis). Complex statistical issues are arising more frequently as the primary research that is summarized in quantitative syntheses itself becomes more complex, and as researchers who are conducting meta-analyses become more ambitious in the questions they wish to address. Also as researchers have gained more experience in conducting research syntheses, several key issues have persisted and now appear fundamental to the enterprise of summarizing research. Specifically the book describes multivariate analyses for several indices commonly used in meta-analysis (e.g., correlations, effect sizes, proportions and/or odds ratios), will outline how to do power analysis for meta-analysis (again for each of the different kinds of study outcome indices), and examines issues around research quality and research design and their roles in synthesis. For each of the statistical topics we will examine the different possible statistical models (i.e., fixed, random, and mixed models) that could be adopted by a researcher. In dealing with the issues of study quality and research design it covers a number of specific topics that are of broad concern to research synthesists. In many fields a current issue is how to make sense of results when studies using several different designs appear in a research literature (e.g., Morris & Deshon, 1997, 2002). In education and other social sciences a critical aspect of this issue is how one might incorporate qualitative (e.g., case study) research within a synthesis. In medicine, related issues concern whether and how to summarize observational studies, and whether they should be combined with randomized controlled trials (or even if they should be combined at all). For each topic, included is a worked example (e.g., for the statistical analyses) and/or a detailed description of a published research synthesis that deals with the practical (non-statistical) issues covered.

is meta analysis quantitative: *Doing Meta-Analysis with R* Mathias Harrer, Pim Cuijpers, Toshi A. Furukawa, David D. Ebert, 2021-09-15 Doing Meta-Analysis with R: A Hands-On Guide serves as an accessible introduction on how meta-analyses can be conducted in R. Essential steps for meta-analysis are covered, including calculation and pooling of outcome measures, forest plots, heterogeneity diagnostics, subgroup analyses, meta-regression, methods to control for publication bias, risk of bias assessments and plotting tools. Advanced but highly relevant topics such as network meta-analysis, multi-three-level meta-analyses, Bayesian meta-analysis approaches and SEM meta-analysis are also covered. A companion R package, dmetar, is introduced at the beginning of the guide. It contains data sets and several helper functions for the meta and metafor package used in the guide. The programming and statistical background covered in the book are kept at a non-expert level, making the book widely accessible. Features • Contains two introductory chapters on how to set up an R environment and do basic imports/manipulations of meta-analysis data,

including exercises • Describes statistical concepts clearly and concisely before applying them in R • Includes step-by-step guidance through the coding required to perform meta-analyses, and a companion R package for the book

is meta analysis quantitative: Systematic Reviews and Meta-Analysis Jacqueline Corcoran, Vijayan Pillai, 2008-02-13 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 boo'ks 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.

is meta analysis quantitative: Handbook of Meta-analysis in Ecology and Evolution Julia Koricheva, Jessica Gurevitch, Kerrie Mengersen, 2013-04-21 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

is meta analysis quantitative: Introduction to Meta-Analysis Michael Borenstein, Larry V. Hedges, Julian P. T. Higgins, Hannah R. Rothstein, 2011-08-24 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

is meta analysis quantitative: *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.

is meta analysis quantitative: Handbook of Meta-Analysis Christopher H. Schmid, Theo Stijnen, Ian White, 2020-09-07 1. Provides a comprehensive overview of meta-analysis methods and applications. 2. Divided into four major sub-topics, covering univariate meta-analysis, multivariate, applications and policy. 3. Designed to be suitable for graduate students and researchers new to the field. 4. Includes lots of real examples, with data and software code made available. 5. Chapters written by the leading researchers in the field.

is meta analysis quantitative: Meta-Ethnography George W. Noblit, R. Dwight Hare, 1988-02 How can ethnographic studies be generalized, in contrast to concentrating on the individual case? Noblit and Hare propose a new method for synthesizing from qualitative studies: meta-ethnography. After citing the criteria to be used in comparing qualitative research projects, the authors define the ways these can then be aggregated to create more cogent syntheses of research. Using examples from numerous studies ranging from ethnographic work in educational settings to the Mead-Freeman controversy over Samoan youth, Meta-Ethnography offers useful procedural advice from both comparative and cumulative analyses of qualitative data. This provocative volume will be read with interest by researchers and students in qualitative research methods, ethnography, education, sociology, and anthropology. After defining metaphor and synthesis, these authors

provide a step-by-step program that will allow the researcher to show similarity (reciprocal translation), difference (refutation), or similarity at a higher level (lines or argument synthesis) among sample studies....Contain(s) valuable strategies at a seldom-used level of analysis. --Contemporary Sociology The authors made an important contribution by reframing how we think of ethnography comparison in a way that is compatible with the new developments in interpretive ethnography. Meta-Ethnography is well worth consulting for the problem definition it offers. --The Journal of Nervous and Mental Disease This book had to be written and I am pleased it was. Someone needed to break the ice and offer a strategy for summarizing multiple ethnographic studies. Noblit and Hare have done a commendable job of giving the research community one approach for doing so. Further, no one else can now venture into this area of synthesizing qualitative studies without making references to and positioning themselves vis-a-vis this volume. -Educational Studies

is meta analysis quantitative: Finding What Works in Health Care Institute of Medicine, Board on Health Care Services, Committee on Standards for Systematic Reviews of Comparative Effectiveness Research, 2011-07-20 Healthcare decision makers in search of reliable information that compares health interventions increasingly turn to systematic reviews for the best summary of the evidence. Systematic reviews identify, select, assess, and synthesize the findings of similar but separate studies, and can help clarify what is known and not known about the potential benefits and harms of drugs, devices, and other healthcare services. Systematic reviews can be helpful for clinicians who want to integrate research findings into their daily practices, for patients to make well-informed choices about their own care, for professional medical societies and other organizations that develop clinical practice guidelines. Too often systematic reviews are of uncertain or poor quality. There are no universally accepted standards for developing systematic reviews leading to variability in how conflicts of interest and biases are handled, how evidence is appraised, and the overall scientific rigor of the process. In Finding What Works in Health Care the Institute of Medicine (IOM) recommends 21 standards for developing high-quality systematic reviews of comparative effectiveness research. The standards address the entire systematic review process from the initial steps of formulating the topic and building the review team to producing a detailed final report that synthesizes what the evidence shows and where knowledge gaps remain. Finding What Works in Health Care also proposes a framework for improving the quality of the science underpinning systematic reviews. This book will serve as a vital resource for both sponsors and producers of systematic reviews of comparative effectiveness research.

is meta analysis quantitative: Meta-Analysis John Edward Hunter, Frank L. Schmidt, Gregg B. Jackson, 1982-10 There are few areas of modern life that are burdened by as much information and advice, often contradictory, as our diet and health: eat a lot of meat, eat no meat; whole-grains are healthy, whole-grains are a disaster; eat everything in moderation; eat only certain foods--and on and on. In One Hundred Million Years of Food biological anthropologist Stephen Le explains how cuisines of different cultures are a result of centuries of evolution, finely tuned to our biology and surroundings. Today many cultures have strayed from their ancestral diets, relying instead on mass-produced food often made with chemicals that may be contributing to a rise in so-called Western diseases, such as cancer, heart disease, and obesity. Travelling around the world to places as far-flung as Vietnam, Kenya, India, and the US, Stephen Le introduces us to people who are growing, cooking, and eating food using both traditional and modern methods, striving for a sustainable, healthy diet. In clear, compelling arguments based on scientific research, Le contends that our ancestral diets provide the best first line of defense in protecting our health and providing a balanced diet. Fast-food diets, as well as strict regimens like paleo or vegan, in effect highjack our biology and ignore the complex nature of our bodies. In One Hundred Million Years of Food Le takes us on a guided tour of evolution, demonstrating how our diets are the result of millions of years of history, and how we can return to a sustainable, healthier way of eating.--Publisher's description.

is meta analysis quantitative: *Methods of Meta-Analysis* John E Hunter, Frank L. Schmidt, 2004-04-07 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.

is meta analysis quantitative: Presenting Medical Statistics from Proposal to Publication Janet L. Peacock, Sally M. Kerry, Raymond R. Balise, 2017-07-21 As many medical and healthcare researchers have a love-hate relationship with statistics, the second edition of this practical reference book may make all the difference. Using practical examples, mainly from the authors' own research, the book explains how to make sense of statistics, turn statistical computer output into coherent information, and help decide which pieces of information to report and how to present them. The book takes you through all the stages of the research process, from the initial research proposal, through ethical approval and data analysis, to reporting on and publishing the findings. Helpful tips and information boxes, offer clear guidance throughout, including easily followed instructions on how to: -develop a quantitative research proposal for ethical/institutional approval or research funding -write up the statistical aspects of a paper for publication -choose and perform simple and more advanced statistical analyses -describe the statistical methods and present the results of an analysis. This new edition covers a wider range of statistical programs - SAS, STATA, R, and SPSS, and shows the commands needed to obtain the analyses and how to present it, whichever program you are using. Each specific example is annotated to indicate other scenarios that can be analysed using the same methods, allowing you to easily transpose the knowledge gained from the book to your own research. The principles of good presentation are also covered in detail, from translating relevant results into suitable extracts, through to randomised controlled trials, and how to present a meta-analysis. An added ingredient is the inclusion of code and datasets for all analyses shown in the book on our website (http://medical-statistics.info). Written by three experienced biostatisticians based in the UK and US, this is a step-by-step guide that will be invaluable to researchers and postgraduate students in medicine, those working in the professions allied to medicine, and statisticians in consultancy roles.

is meta analysis quantitative: *Meta-regression Analysis in Economics and Business* T. D. Stanley, Hristos Doucouliagos, 2012 Meta-Regression Analysis in Economics and Business is the first text devoted to the meta-regression analysis (MRA) of economics and business research.

is meta analysis quantitative: *An Introduction to Systematic Reviews* David Gough, Sandy Oliver, James Thomas, 2012-03-22 This timely, engaging book provides an overview of the nature, logic, diversity and process of undertaking systematic reviews as part of evidence informed decision making. A focused, accessible and technically up-to-date book, it covers the full breadth of approaches to reviews from statistical meta analysis to meta ethnography. It is ideal for anyone undertaking their own systematic review - providing all the necessary conceptual and technical background needed to make a good start on the process. The content is divided into five clear sections: • Approaches to reviewing • Getting started • Gathering and describing research • Appraising and synthesising data • Making use of reviews/models of research use. Easy to read and logically structured, this book is essential reading for anyone doing systematic reviews. David Gough is Professor of Evidence Informed Policy and Practice and Director of SSRU and its EPPI-Centre and Co-Editor of the journal Evidence & Policy. Sandy Oliver is Professor of Public Policy and Deputy Director of SSRU and its EPPI-Centre. James Thomas is Reader in Social Policy, Assistant Director of SSRU and Associate Direcctor of the EPPI-Centre.

is meta analysis quantitative: Handbook of Ethics in Quantitative Methodology A. T. Panter, Sonya K. Sterba, 2011-03-01 This comprehensive Handbook is the first to provide a practical, interdisciplinary review of ethical issues as they relate to quantitative methodology including how to present evidence for reliability and validity, what comprises an adequate tested population, and what constitutes scientific knowledge for eliminating biases. The book uses an ethical framework that emphasizes the human cost of quantitative decision making to help researchers understand the specific implications of their choices. The order of the Handbook chapters parallels the chronology of the research process: determining the research design and data collection; data analysis; and communicating findings. Each chapter: Explores the ethics of a particular topic Identifies prevailing methodological issues Reviews strategies and approaches for

handling such issues and their ethical implications Provides one or more case examples Outlines plausible approaches to the issue including best-practice solutions. Part 1 presents ethical frameworks that cross-cut design, analysis, and modeling in the behavioral sciences. Part 2 focuses on ideas for disseminating ethical training in statistics courses. Part 3 considers the ethical aspects of selecting measurement instruments and sample size planning and explores issues related to high stakes testing, the defensibility of experimental vs. quasi-experimental research designs, and ethics in program evaluation. Decision points that shape a researchers' approach to data analysis are examined in Part 4 – when and why analysts need to account for how the sample was selected, how to evaluate tradeoffs of hypothesis-testing vs. estimation, and how to handle missing data. Ethical issues that arise when using techniques such as factor analysis or multilevel modeling and when making causal inferences are also explored. The book concludes with ethical aspects of reporting meta-analyses, of cross-disciplinary statistical reform, and of the publication process. This Handbook appeals to researchers and practitioners in psychology, human development, family studies, health, education, sociology, social work, political science, and business/marketing. This book is also a valuable supplement for quantitative methods courses required of all graduate students in these fields.

is meta analysis quantitative: How to Perform a Systematic Literature Review Edward Purssell, Niall McCrae, 2020-08-04 The systematic review is a rigorous method of collating and synthesizing evidence from multiple studies, producing a whole greater than the sum of parts. This textbook is an authoritative and accessible guide to an activity that is often found overwhelming. The authors steer readers on a logical, sequential path through the process, taking account of the different needs of researchers, students and practitioners. Practical guidance is provided on the fundamentals of systematic reviewing and also on advanced techniques such as meta-analysis. Examples are given in each chapter, with a succinct glossary to support the text. This up-to-date, accessible textbook will satisfy the needs of students, practitioners and educators in the sphere of healthcare, and contribute to improving the quality of evidence-based practice. The authors will advise some freely available or inexpensive open source/access resources (such as PubMed, R and Zotero) to help students how to perform a systemic review, in particular those with limited resources.

is meta analysis quantitative: Applied Meta-Analysis for Social Science Research Noel A. Card, 2015-10-06 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

is meta analysis quantitative: Network Meta-Analysis for Decision-Making Sofia Dias, A. E. Ades, Nicky J. Welton, Jeroen P. Jansen, Alexander J. Sutton, 2018-03-19 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.

is meta analysis quantitative: Meta-Analysis, Decision Analysis, and Cost-Effectiveness Analysis Diana B. Petitti, 2000 Public health and in health policy courses at the undergraduate and graduate level.

is meta analysis quantitative: *The Handbook of Research Synthesis and Meta-Analysis* Harris Cooper, Larry V. Hedges, Jeffrey C. Valentine, 2019-06-14 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

is meta analysis quantitative: The Encyclopedia of Research Methods in Criminology and Criminal Justice, 2 Volume Set J. C. Barnes, David R. Forde, 2021-09-08 The Encyclopedia of RESEARCH METHODS IN CRIMINOLOGY & CRIMINAL JUSTICE The most comprehensive reference work on research designs and methods in criminology and criminal justice This Encyclopedia of Research Methods in Criminology and Criminal Justice offers a comprehensive survey of research methodologies and statistical techniques that are popular in criminology and criminal justice systems across the globe. With contributions from leading scholars and practitioners in the field, it offers a clear insight into the techniques that are currently in use to answer the pressing questions in criminology and criminal justice. The Encyclopedia contains essential information from a diverse pool of authors about research designs grounded in both qualitative and quantitative approaches. It includes information on popular datasets and leading resources of government statistics. In addition, the contributors cover a wide range of topics such as: the most current research on the link between guns and crime, rational choice theory, and the use of technology like geospatial mapping as a crime reduction tool. This invaluable reference work: Offers a comprehensive survey of international research designs, methods, and statistical techniques Includes contributions from leading figures in the field Contains data on criminology and criminal justice from Cambridge to Chicago Presents information on capital punishment, domestic violence, crime science, and much more Helps us to better understand, explain, and prevent crime Written for undergraduate students, graduate students, and researchers, The Encyclopedia of Research Methods in Criminology and Criminal Justice is the first reference work of its kind to offer a comprehensive review of this important topic.

is meta analysis quantitative: Systematic Reviews in Health Care Matthias Egger, George Davey-Smith, Douglas Altman, 2008-04-15 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.

is meta analysis quantitative: Meta-Analysis with R Guido Schwarzer, James R. Carpenter, Gerta Rücker, 2015-10-08 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.

is meta analysis quantitative: Research Synthesis and Meta-Analysis Harris Cooper, 2015-12-24 The Fifth Edition of Harris Cooper's bestselling text offers practical advice on how to conduct a synthesis of research in the social, behavioral, and health sciences. The book is written in plain language with four running examples drawn from psychology, education, and health science. With ample coverage of literature searching and the technical aspects of meta-analysis, this one-of-a-kind book applies the basic principles of sound data gathering to the task of producing a comprehensive assessment of existing research.

is meta analysis quantitative: *Improving Learning* Steve Higgins, 2019 Evidence-informed teaching is essential for effective teaching, but it is important to understand its limitations as well as its benefits.

is meta analysis quantitative: *Biostatistics for Medical and Biomedical Practitioners* Julien I. E. Hoffman, 2015-09-03 Biostatistics for Practitioners: An Interpretative Guide for Medicine and Biology deals with several aspects of statistics that are indispensable for researchers and students across the biomedical sciences. The book features a step-by-step approach, focusing on standard statistical tests, as well as discussions of the most common errors. The book is based on the author's 40+ years of teaching statistics to medical fellows and biomedical researchers across a wide range of fields. - Discusses how to use the standard statistical tests in the biomedical field, as well as how to make statistical inferences (t test, ANOVA, regression etc.) - Includes non-standards tests, including equivalence or non-inferiority testing, extreme value statistics, cross-over tests, and simple time series procedures such as the runs test and Cusums - Introduces procedures such as multiple regression, Poisson regression, meta-analysis and resampling statistics, and provides references for further studies

is meta analysis quantitative: Practical Meta-Analysis Mark W. Lipsey, David B. Wilson, 2001 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.

is meta analysis quantitative: Good Research Practice in Non-Clinical Pharmacology and Biomedicine Anton Bespalov, Martin C. Michel, Thomas Steckler, 2020-01-01 This open access book, published under a CC BY 4.0 license in the Pubmed indexed book series Handbook of Experimental Pharmacology, provides up-to-date information on best practice to improve experimental design and quality of research in non-clinical pharmacology and biomedicine.

is meta analysis quantitative: Applying Quantitative Bias Analysis to Epidemiologic Data Timothy L. Lash, Matthew P. Fox, Aliza K. Fink, 2011-04-14 Bias analysis quantifies the influence of systematic error on an epidemiology study's estimate of association. The fundamental methods of bias analysis in epi- miology have been well described for decades, yet are seldom applied in published presentations of epidemiologic research. More recent advances in bias analysis, such as probabilistic bias analysis, appear even more rarely. We suspect that there are both supply-side and demand-side explanations for the scarcity of bias analysis. On the demand side, journal reviewers and editors seldom request that authors address systematic error aside from listing them as limitations of their particular study. This listing is often accompanied by explanations for why the limitations should not pose much concern. On the supply side, methods for bias analysis receive little attention in most epidemiology curriculums, are often scattered throughout textbooks or absent from them altogether, and cannot be implemented easily using standard statistical

computing software. Our objective in this text is to reduce these supply-side barriers, with the hope that demand for quantitative bias analysis will follow.

is meta analysis quantitative: Meta-Analysis Mike W.-L. Cheung, 2015-05-06 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.

is meta analysis quantitative: Synthesizing Quantitative Evidence , 2011 The objective of a systematic review is to summarize the evidence on a specific clinical question using a transparent, a-priori protocol driven approach. This book provides an overview of the fundamental knowledge, principals and processes for the synthesis of quantitative data in reviews of the effectiveness of health care interventions. As such, it is designed for new reviewers, for students and as an introductory text for academics looking for a book on the fundamentals rather than advanced statistical processes.--[source inconnue].

is meta analysis quantitative: *Systematic Reviews in the Social Sciences* Mark Petticrew, Helen Roberts, 2008-04-15 Such diverse thinkers as Lao-Tze, Confucius, and U.S. Defense Secretary Donald Rumsfeld have all pointed out that we need to be able to tell the difference between real and assumed knowledge. The systematic review is a scientific tool that can help with this difficult task. It can help, for example, with appraising, summarising, and communicating the results and implications of otherwise unmanageable quantities of data. This book, written by two highly-respected social scientists, provides an overview of systematic literature review methods: Outlining the rationale and methods of systematic reviews; Giving worked examples from social science and other fields; Applying the practice to all social science disciplines; It requires no previous knowledge, but takes the reader through the process stage by stage; Drawing on examples from such diverse fields as psychology, criminology, education, transport, social welfare, public health, and housing and urban policy, among others. Including detailed sections on assessing the quality of both quantitative, and qualitative research; searching for evidence in the social sciences; meta-analytic and other methods of evidence synthesis; publication bias; heterogeneity; and approaches to dissemination.

is meta analysis quantitative: The Routledge Handbook of Research Methods in Applied Linguistics Jim McKinley, Heath Rose, 2019-12-06 The Routledge Handbook of Research Methods in Applied Linguistics provides a critical survey of the methodological concepts, designs, instruments and types of analysis that are used within the broad field of applied linguistics. With more than 40 chapters written by leading and emerging scholars, this book problematizes and theorizes applied linguistics research, incorporating numerous multifaceted methodological considerations and pointing to the future of good practice in research. Topics covered include: key concepts and constructs in research methodology, such as sampling strategies and mixed methods research; research designs such as experimental research, case study research, and action research; data collection methods, from questionnaires and interviews to think-aloud protocols and data

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is meta analysis quantitative: Costs, Risks, and Benefits of Surgery John P. Bunker, Benjamin A. Barnes, Frederick Mosteller, 1977

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