Handbook Of Causal Analysis For Social Research Khbd

This book summarizes recent advances in causal inference and underscores the paradigmatic shifts that must be undertaken in moving from traditional statistical analysis to causal analysis of multivariate data. Special emphasis is placed on the assumptions that underlie all causal inferences, the languages used in formulating those assumptions, the conditional nature of all causal and counterfactual claims, and the methods that have been developed for the assessment of such claims. These advances are illustrated using a general theory of causation based on the Structural Causal Model (SCM), which subsumes and unifies other approaches to causation, and provides a coherent mathematical foundation for the analysis of causes and counterfactuals. In particular, the paper surveys the development of mathematical tools for inferring (from a combination of data and assumptions) answers to three types of causal queries: those about (1) the effects of potential interventions, (2) probabilities of counterfactuals, and (3) direct and indirect effects (also known as "mediation"). Finally, the paper defines the formal and conceptual relationships between the structural and potential-outcome frameworks and presents tools for a symbiotic analysis that uses the strong features of both. The tools are demonstrated in the analyses of mediation, causes of effects, and probabilities of causation.

An accessible, contemporary introduction to the methods for determining cause and effect in the social sciences "Causation versus correlation has been the basis of arguments--economic and otherwise--since the beginning of time. Causal Inference: The Mixtape uses legit real-world examples that I found genuinely thought-provoking. It's rare that a book prompts readers to expand their outlook; this one did for me."--Marvin Young (Young MC) Causal inference encompasses the tools that allow social scientists to determine what causes what. In a messy world, causal inference is what helps establish the causes and effects of the actions being studied--for example, the impact (or lack thereof) of increases in the minimum wage on employment, the effects of early childhood education on incarceration later in life, or the influence on economic growth of introducing malaria nets in developing regions. Scott Cunningham introduces students and practitioners to the methods necessary to arrive at meaningful answers to the questions of causation, using a range of modeling techniques and coding instructions for both the R and the Stata programming languages.

Written by one of the preeminent researchers in the field, this book provides a comprehensive exposition of modern analysis of causation. It shows how causality has grown from a nebulous concept into a mathematical theory with significant applications in the fields of statistics, artificial intelligence, economics, philosophy, cognitive science, and the health and social sciences. Judea Pearl presents and unifies the probabilistic, manipulative, counterfactual, and structural approaches to causation and devises simple mathematical tools for studying the relationships between causal connections and statistical associations. Cited in more than 2,100 scientific publications, it continues to liberate scientists from the traditional molds of statistical thinking. In this revised edition, Judea Pearl elucidates thorny issues, answers readers' questions, and offers a panoramic view of recent advances in this field of research. Causality will be of interest to students and professionals in a wide variety of fields. Dr Judea Pearl has received the 2011 Rumelhart Prize for his leading research in Artificial Intelligence (AI) and systems from The Cognitive Science Society.

The Routledge Handbook of Social Work Practice Research is the first international handbook to focus on practice research for social work. Bringing together leading scholars in the field from Europe, the USA and the Asia Pacific region, it provides an up-to-the minute overview of the latest thinking in practice research whilst also providing practical advice on how to undertake practice research in the field. It is divided into five sections: State of the art Methodologies Pedagogies Applications Expanding the frontiers The range of topics discussed will enhance student development as well as increase the capacity of practitioners to conduct research; develop coordinating and leadership roles; and liaise with multiple stakeholders who will strengthen the context base for practice research. As such, this handbook will be essential reading for all social work students, practitioners and academics as well as those working in other health and social care settings.

Causality offers the first comprehensive coverage of causal analysis in many sciences, including recent advances using graphical methods. Pearl presents a unified account of the probabilistic, manipulative, counterfactual and structural approaches to causation, and devises simple mathematical tools for analyzing the relationships between causal connections and statistical associations. The book will facilitate the incorporation of causal analysis as an integral part of the standard curriculum in statistics, business, epidemiology, social science and economics. Causality will be of interest to professionals and students in the fields of statistics, artificial intelligence, philosophy, cognitive science, and the health and social sciences.

A fundamental book for social researchers. It provides a first-class, reliable guide to the basic issues in data analysis. Scholars and students can turn to it for teaching and applied needs with confidence.

Causation is at once familiar and mysterious. Many believe that the causal relation is not directly observable, but that we nevertheless can somehow detect its presence in the world. Common sense seems to have a firm grip on causation, and much work in the natural and social sciences relies on the idea. Yet neither common sense nor extensive philosophical debate has led us to anything like agreement on the correct analysis of the concept of causation, or an account of the metaphysical nature of the causal relation. Contemporary debates are driven by opposing motivations, conflicting intuitions, and unarticulated methodological assumptions. Causation: A User's Guide cuts a clear path through this confusing but vital landscape. L. A. Paul and Ned Hall guide the reader through the most important philosophical treatments of causation, negotiating the terrain by taking a set of examples as landmarks. Special attention is given to counterfactual and related analyses of causation. Using a methodological principle based on the close examination of potential counterexamples, they clarify the central themes of the debate about causation, and cover questions about causation involving omissions or absences, preemption and other species of redundant causation, and the possibility that causation is not transitive. Along the way, Paul and Hall examine several contemporary proposals for analyzing the nature of causation and assess their merits and overall methodological cogency. The book is designed to be of value both to trained specialists and those coming to the problem of causation for the first time. It provides the reader with a broad and sophisticated view of the metaphysics of the causal relation.

"A comprehensive book on methods for mediation and interaction. The only book to approach this topic from the perspective of causal inference. Numerous software tools provided. Easy-to-read and accessible. Examples drawn from diverse fields. An essential reference for anyone conducting empirical research in the biomedical or social sciences"--

The second edition of the Impact Evaluation in Practice handbook is a comprehensive and accessible introduction to impact evaluation for policy makers and development practitioners. First published in 2011, it has been used widely across the development and academic communities. The book incorporates real-world examples to present practical guidelines for designing and implementing impact evaluations. Readers will gain an understanding of impact evaluations and the best ways to use them to design evidence-based policies and programs. The updated version covers the newest techniques for evaluating programs and includes state-of-the-art implementation advice, as well as an expanded set of examples and case studies that draw on recent development challenges. It also includes new material on research ethics and partnerships to conduct impact evaluation. The handbook is divided into four sections: Part One discusses what to evaluate and why; Part Two presents the main impact evaluation methods; Part Three addresses how to manage impact evaluations; Part Four reviews impact evaluation sampling and data collection. Case studies illustrate different applications of impact evaluations. The book links to complementary instructional material available online, including an applied case as well as questions and answers. The updated second edition will be a valuable resource for the international development community, universities, and policy makers looking to build better evidence around what works in development.

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

The Oxford Handbook of Causal Reasoning offers a state-of-the-art review of one of our most central cognitive competencies, which has for a long time been neglected in cognitive psychology. This Handbook provides introductions of competing theories of causal reasoning, and discusses its role in various cognitive functions and domains.

The first comprehensive structural equation modeling (SEM) handbook, this accessible volume presents both the mechanics of SEM and specific SEM strategies and applications. The editor, contributors, and editorial advisory board are leading methodologists who have organized the book to move from simpler material to more statistically complex modeling approaches. Sections cover the foundations of SEM; statistical underpinnings, from assumptions to model modifications; steps in implementation, from data preparation through writing the SEM report; and basic and advanced applications, including new and emerging topics in SEM. Each chapter provides conceptually oriented descriptions, fully explicated analyses, and engaging examples that reveal modeling possibilities for use with readers' data. Many of the chapters also include access to data and syntax files at the companion website, allowing readers to try their hands at reproducing the authors' results.

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

What constitutes a causal explanation, and must an explanation be causal? What warrants a causal inference, as opposed to a descriptive regularity? What techniques are available to detect when causal effects are present, and when can these techniques be used to identify the relative importance of these effects? What complications do the interactions of individuals create for these techniques? When can mixed methods of analysis be used to deepen causal accounts? Must causal claims include generative mechanisms, and how effective are empirical methods designed to discover them? The Handbook of Causal Analysis for Social Research tackles these questions with nineteen chapters from leading scholars in sociology, statistics, public health, computer science, and human development.

A new approach for defining causality and such related notions as degree of responsibility, degrees of blame, and causal explanation. Causality plays a central role in the way people structure the world; we constantly seek causal explanations for our observations. But what does it even mean that an event C "actually caused" event E? The problem of defining actual causation goes beyond mere philosophical speculation. For example, in many legal arguments, it is precisely what needs to be established in order to determine responsibility. The philosophy literature has been struggling with the problem of defining causality since Hume. In this book, Joseph Halpern explores actual causality, and such related notions as degree of responsibility, degree of blame, and causal explanation. The goal is to arrive at a definition of causality that matches our natural language usage and is helpful, for example, to a jury deciding a legal case, a programmer looking for the line of code that cause some software to fail, or an economist trying to determine whether austerity caused a subsequent depression. Halpern applies and expands an approach to causality that he and Judea Pearl developed, based on structural equations. He carefully formulates a definition of causality, and building on this, defines degree of responsibility, degree of blame, and causal explanation. He concludes by discussing how these ideas can be applied to such practical problems as accountability and program verification. Technical details are generally confined to the final section of each chapter and can be skipped by non-mathematical readers.

A concise and self-contained introduction to causal inference, increasingly important in data science and machine learning. The mathematization of causality is a relatively recent development, and has become increasingly important in data science and machine learning. This book offers a self-contained and concise introduction to causal models and how to learn them from data. After explaining the need for causal models and discussing some of the principles underlying causal inference, the book teaches readers how to use causal models: how to compute intervention distributions, how to infer causal models from observational and interventional data, and how causal ideas could be exploited for classical machine learning problems. All of these topics are discussed first in terms of two variables and then in the more general multivariate case. The bivariate case turns out to be a particularly hard problem for causal learning because there are no conditional independences as used by classical methods for solving multivariate cases. The authors consider analyzing statistical asymmetries between cause and effect to be highly instructive, and they report on their decade of intensive research into this problem. The book is accessible to readers with a background in machine learning or statistics, and can be used in graduate courses or as a reference for researchers. The text includes code snippets that can be copied and pasted, exercises, and an appendix with a summary of the most important technical concepts.

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

Edited by experts at the leading edge of the development of causal assessment methods for more than two decades, Ecological Causal Assessment gives insight and expert guidance on how to identify cause-effect relationships in environmental systems. The book discusses the importance of asking the fundamental question "Why did this effect happen?" before moving on to "How can we fix it?" The book provides a deeper understanding of different philosophical and analytical approaches, and of cognitive tendencies that can lead to errors. It describes formal

processes for causal assessment that are particularly helpful when the situation is complex or contentious. It also describes how to approach the analysis of available data and to optimize collection efforts. The text then details a transparent process that helps others replicate results and can be used to convince skeptics that the true cause has been identified. Several detailed case studies show how to apply the process to streams, watersheds, and a terrestrial wildlife population. Causal assessment is a challenging, but endlessly fascinating endeavor. Success requires the persistence to figure things out and solid strategies for using the information that you have and getting more of the right kind of information that you need. This book gives you just that: the skills, knowledge, and confidence needed to successfully unravel tough environmental problems and build the knowledge base for effective management solutions.

The application of causal inference methods is growing exponentially in fields that deal with observational data. Written by pioneers in the field, this practical book presents an authoritative yet accessible overview of the methods and applications of causal inference. With a wide range of detailed, worked examples using real epidemiologic data as well as software for replicating the analyses, the text provides a thorough introduction to the basics of the theory for non-time-varying treatments and the generalization to complex longitudinal data.

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

This new edition aims to convince social scientists to take a counterfactual approach to the core questions of their fields.

The philosophy of the social sciences considers the underlying explanatory powers of the social (or human) sciences, such as history, economics, anthropology, politics, and sociology. The type of questions covered includes the methodological (the nature of observations, laws, theories, and explanations) to the ontological — whether or not these sciences can explain human nature in a way consistent with common-sense beliefs. This Handbook is a major, comprehensive look at the key ideas in the field, is guided by several principles. The first is that the philosophy of social science should be closely connected to, and informed by, developments in the sciences themselves. The second is that the volume should appeal to practicing social scientists as well as philosophers, with the contributors being both drawn from both ranks, and speaking to ongoing controversial issues in the field. Finally, the volume promotes connections across the social sciences, with greater internal discussion and interaction across disciplinary boundaries.

While some social scientists may argue that we have always been networked, the increased visibility of networks today across economic, political, and social domains can hardly be disputed. Social networks fundamentally shape our lives and social network analysis has become a vibrant, interdisciplinary field of research. In The Oxford Handbook of Social Networks, Ryan Light and James Moody have gathered forty leading scholars in sociology, archaeology, economics, statistics, and information science, among others, to provide an overview of the theory, methods, and contributions in the field of social networks. Each of the thirty-three chapters in this Handbook moves through the basics of social network analysis aimed at those seeking an introduction to advanced and novel approaches to modeling social networks statistically. They cover both a succinct background to, and future directions for, distinctive approaches to analyzing social networks. The first section of the volume consists of theoretical and methodological approaches to social networks, such as visualization and network analysis, statistical approaches to networks, and network dynamics. Chapters in the second section outline how network perspectives have contributed substantively across numerous fields, including public health, political analysis, and organizational studies. Despite the rapid spread of interest in social network analysis, few volumes capture the state-of-the-art theory, methods, and substantive contributions featured in this volume. This Handbook therefore offers a valuable resource for graduate students and faculty new to networks looking to learn new approaches, scholars interested in an overview of the field, and network analysts looking to expand their skills or substantive areas of research.

Recent years have seen an explosion in new kinds of data on infectious diseases, including data on social contacts, whole genome sequences of pathogens, biomarkers for susceptibility to infection, serological panel data, and surveillance data. The Handbook of Infectious Disease Data Analysis provides an overview of many key statistical methods that have been developed in response to such new data streams and the associated ability to address key scientific and epidemiological questions. A unique feature of the Handbook is the wide range of topics covered. Key features Contributors include many leading researchers in the field Divided into four main sections: Basic concepts, Analysis of Outbreak Data, Analysis of Seroprevalence Data, Analysis of Surveillance Data Numerous case studies and examples throughout Provides both introductory material and key reference material

'The editors of the new SAGE Handbook of Regression Analysis and Causal Inference have assembled a wide-ranging, high-quality, and timely collection of articles on topics of central importance to quantitative social research, many written by leaders in the field. Everyone engaged in statistical analysis of social-science data will find something of interest in this book.' - John Fox, Professor, Department of Sociology, McMaster University 'The authors do a great job in explaining the various statistical methods in a clear and simple way - focussing on fundamental understanding, interpretation of results, and practical application - yet being precise in their exposition.' - Ben Jann, Executive Director, Institute of Sociology, University of Bern 'Best and Wolf have put together a powerful collection, especially valuable in its separate discussions of uses for both cross-sectional and panel data analysis.' -Tom Smith, Senior Fellow, NORC, University of Chicago Edited and written by a team of leading international social scientists, this Handbook provides a comprehensive introduction to multivariate methods. The Handbook focuses on regression analysis of cross-sectional and longitudinal data with an emphasis on causal analysis, thereby covering a large number of different techniques including selection models, complex samples, and regression discontinuities. Each Part starts with a non-mathematical introduction to the method covered in that section, giving readers a basic knowledge of the method's logic, scope and unique features. Next, the mathematical and statistical basis of each method is presented along with advanced aspects. Using real-world data from the European Social Survey

(ESS) and the Socio-Economic Panel (GSOEP), the book provides a comprehensive discussion of each method's application, making this an ideal text for PhD students and researchers embarking on their own data analysis.

David A. Freedman presents a definitive synthesis of his approach to statistical modeling and causal inference in the social sciences.

This accessible, interdisciplinary and non-technical approach to longitudinal research identifies ways in which longitudinal research crosses the barriers between disciplines. The author covers a wide variety of subjects ranging from the differences between longitudinal and cross-sectional research in terms of consistency and accuracy of results to issues that may affect the quality of longitudinal data.

In recent years, interest in rigorous impact evaluation has grown tremendously in policy-making, economics, public health, social sciences and international relations. Evidence-based policy-making has become a recurring theme in public policy, alongside greater demands for accountability in public policies and public spending, and requests for independent and rigorous impact evaluations for policy evidence. Frlich and Sperlich offer a comprehensive and up-to-date approach to quantitative impact evaluation analysis, also known as causal inference or treatment effect analysis, illustrating the main approaches for identification and estimation: experimental studies, randomization inference and randomized control trials (RCTs), matching and propensity score matching and weighting, instrumental variable estimation, difference-in-differences, regression discontinuity designs, quantile treatment effects, and evaluation of dynamic treatments. The book is designed for economics graduate courses but can also serve as a manual for professionals in research institutes, governments, and international organizations, evaluating the impact of a wide range of public policies in health, environment, transport and economic development.

Historical institutionalism has deep roots in Political Science and related fields, and crystalized into a distinct research tradition during the 'new institutionalisms' debate that began in the late 1980s. It has since established strong footholds in four large subfields of Political Science: comparative, American, European, and international politics. The present volume is the first to take stock of the tradition's contributions across multiple areas of study,and includes chapters by many of its most prominent practitioners. As the world again grapples with how to understand the short- and long-term consequences of economic crises, revolutions, and newpatterns of governance, historical institutionalism is poised to offer valuable insights into how past events and decisions will shape political trajectories at local, national, and international levels.

A collection of important recent work on thecounterfactual analysis of causation.

This handbook provides a clear examination of case-oriented research. It defines case-based social research as a subfield of methodology.

There is an urgent need to better understand the causes and consequences of obesity, and to learn what works to prevent or reduce obesity. This volume accurately and conveniently summarizes the findings and insights of obesity-related research from the full range of social sciences including anthropology, economics, government, psychology, and sociology. It is an excellent resource for researchers in these areas, both bringing them up to date on the relevant research in their own discipline and allowing them to quickly and easily understand the cutting-edge research being produced in other disciplines. The Oxford Handbook of the Social Science of Obesity is a critical reference for obesity researchers and is also valuable for public health officials, policymakers, nutritionists, and medical practitioners. The first section of the book explains how each social science discipline models human behavior (in particular, diet and physical activity), and summarizes the major research literatures on obesity in that discipline. The second section provides important practical information for researchers, including a guide to publicly available social science data on obesity and an overview of the challenges to causal inference in obesity research. The third part of the book synthesizes social science research on specific causes and correlates of obesity, such as food advertising, food prices, and peers. The fourth section summarizes social science research on the consequences of obesity, such as lower wages, job absenteeism, and discrimination. The fifth and final section reviews the social science literature on obesity treatment and prevention, such as food taxes, school-based interventions, and medical treatments such as anti-obesity drugs and bariatric surgery.

The proposal to vaccinate adolescent girls against the human papilloma virus ignited political controversy, as did the advent of fracking and a host of other emerging technologies. These disputes attest to the persistent gap between expert and public perceptions. Complicating the communication of sound science and the debates that surround the societal applications of that science is a changing media environment in which misinformation can elicit belief without corrective context and likeminded individuals are prone to seek ideologically comforting information within their own self-constructed media enclaves. Drawing on the expertise of leading science communication scholars from six countries, The Oxford Handbook of the Science of Science Communication not only charts the media landscape - from news and entertainment to blogs and films - but also examines the powers and perils of human biases - from the disposition to seek confirming evidence to the inclination to overweight endpoints in a trend line. In the process, it draws together the best available social science on ways to communicate science while also minimizing the pernicious effects of human bias. The Handbook adds case studies exploring instances in which communication undercut or facilitated the access to scientific evidence. The range of topics addressed is wide, from genetically engineered organisms and nanotechnology to vaccination controversies and climate change. Also unique to this book is a focus on the complexities of involving the public in decision making about the uses of science, the regulations that should govern its application, and the ethical boundaries within which science should operate. The Handbook is an invaluable resource for researchers in the communication fields, particularly in science and health communication, as well as to scholars involved in research on scientific topics susceptible to distortion in partisan debate.

This book is devoted to the analysis of causal inference which is one of the most difficult tasks in data analysis: when two phenomena are observed to be related, it is often difficult to decide whether one of them causally influences the other one, or whether these two phenomena have a common cause. This analysis is the main focus of this volume. To get a good understanding of the causal inference, it is important to have models of economic phenomena which are as accurate as possible. Because of this need, this volume also contains papers that use non-traditional economic models, such as fuzzy models and models obtained by using neural networks and data mining techniques. It also contains papers that apply different econometric models to analyze real-life economic dependencies.

Edited and written by a team of leading international social scientists, this handbook provides a comprehensive introduction to multivariate methods. It focuses on regression analysis of cross-sectional and longitudinal data with an emphasis on causal analysis, thereby covering a large number of different techniques including selection models, complex samples, and regression discontinuities.

Bayesian analysis has developed rapidly in applications in the last two decades and research in Bayesian methods remains dynamic and fast-growing. Dramatic advances in modelling concepts and computational technologies now enable routine application of Bayesian analysis using increasingly realistic stochastic models, and this drives the adoption of Bayesian approaches in many areas of science, technology, commerce, and industry. This Handbook explores contemporary Bayesian analysis across a variety of application areas. Chapters written by leading exponents of applied Bayesian analysis showcase the scientific ease and natural application of Bayesian modelling, and present solutions to real, engaging, societally important and demanding problems. The chapters are grouped into five general areas: Biomedical & Health Sciences; Industry, Economics & Finance; Environment & Ecology; Policy, Political & Social Sciences; and Natural & Engineering Sciences, and Appendix material in each touches on key concepts, models, and techniques of the chapter that are also of broader pedagogic and applied interest.

The statistics profession is at a unique point in history. The need for valid statistical tools is greater than ever; data sets are massive, often measuring hundreds of thousands of measurements for a single subject. The field is ready to move towards clear objective benchmarks under which tools can be evaluated. Targeted learning allows (1) the full generalization and utilization of cross-validation as an estimator selection tool so that the subjective choices made by humans are now made by the machine, and (2) targeting the fitting of the probability distribution of the data toward the target parameter representing the scientific question of interest. This book is aimed at both statisticians and applied researchers interested in causal inference and general effect estimation for observational and experimental data. Part I is an accessible introduction to super learning and the targeted maximum likelihood estimator, including related concepts necessary to understand and apply these methods. Parts II-IX handle complex data structures and topics applied researchers will immediately recognize from their own research, including time-to-event outcomes, direct and indirect effects, positivity violations, case-control studies, censored data, longitudinal data, and genomic studies.

Causation is a central topic in many areas of philosophy. In metaphysics, philosophers want to know what causation is, and how it is related to laws of nature, probability, action, and freedom of the will. In epistemology, philosophers investigate how causal claims can be inferred from statistical data, and how causation is related to perception, knowledge and explanation. In the philosophy of mind, philosophers want to know whether and how the mind can be said to have causal efficacy, and in ethics, whether there is a moral distinction between acts and omissions and whether the moral value of an act can be judged according to its consequences. And causation is a contested concept in other fields of enquiry, such as biology, physics, and the law. This book provides an in-depth and comprehensive overview of these and other topics, as well as the history of the causation debate from the ancient Greeks to the logical empiricists. The chapters provide surveys of contemporary debates, while often also advancing novel and controversial claims; and each includes a comprehensive bibliography and suggestions for further reading. The book is thus the most comprehensive source of information about causation currently available, and will be invaluable for upper-level undergraduates through to professional philosophers.

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Applied econometrics, known to aficionados as 'metrics, is the original data science. 'Metrics encompasses the statistical methods economists use to untangle cause and effect in human affairs. Through accessible discussion and with a dose of kung fu–themed humor, Mastering 'Metrics presents the essential tools of econometric research and demonstrates why econometrics is exciting and useful. The five most valuable econometric methods, or what the authors call the Furious Five--random assignment, regression, instrumental variables, regression discontinuity designs, and differences in differences--are illustrated through well-crafted real-world examples (vetted for awesomeness by Kung Fu Panda's Jade Palace). Does health insurance make you healthier? Randomized experiments provide answers. Are expensive private colleges and selective public high schools better than more pedestrian institutions? Regression analysis and a regression discontinuity design reveal the surprising truth. When private banks teeter, and depositors take their money and run, should central banks step in to save them? Differences-in-differences analysis of a Depression-era banking crisis offers a response. Could arresting O. J. Simpson have saved his ex-wife's life? Instrumental variables methods instruct law enforcement authorities in how best to respond to domestic abuse. Wielding econometric tools with skill and confidence, Mastering 'Metrics uses data and statistics to illuminate the path from cause to effect. Shows why econometrics is important Explains econometric research through humorous and accessible discussion Outlines empirical methods central to modern econometric practice Works through interesting and relevant real-world examples