
A Causal R Model Of The Influence Of Information

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Experimental and Quasi-experimental Designs for Generalized Causal Inference Springer Science & Business Media

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.

Discrete Causal Theory Oxford University Press
The philosophical theory of scientific explanation proposed here involves a radically new treatment of causality that accords with the pervasively statistical character of contemporary science. Wesley C. Salmon describes three fundamental conceptions of scientific explanation--the epistemic, modal, and ontic. He

argues that the prevailing view (a version of the epistemic conception) is untenable and that the modal conception is scientifically out-dated. Significantly revising aspects of his earlier work, he defends a causal/mechanical theory that is a version of the ontic conception. Professor Salmon's theory furnishes a robust argument for scientific realism akin to the argument that convinced twentieth-century physical scientists of the existence of atoms and molecules. To do justice to such notions as irreducibly statistical laws and statistical explanation, he offers a novel account of physical randomness. The transition from the "reviewed view" of scientific explanation (that explanations are arguments) to the causal/mechanical model requires fundamental rethinking of basic explanatory concepts.

A Constructive Critique MIT Press

Although many books currently available describe statistical models and methods for analyzing longitudinal data, they do not highlight connections between various research threads in the statistical literature. Responding to this void, *Longitudinal Data Analysis* provides a clear, comprehensive, and unified overview of state-of-the-art theory and applications. It also focuses on the assorted challenges that arise in analyzing longitudinal data. After discussing historical aspects, leading researchers explore four broad themes: parametric modeling, nonparametric and semiparametric methods, joint models, and incomplete data. Each of these sections begins with an introductory chapter that provides useful background material and a

broad outline to set the stage for subsequent chapters. Rather than focus on a narrowly defined topic, chapters integrate important research discussions from the statistical literature. They seamlessly blend theory with applications and include examples and case studies from various disciplines. Destined to become a landmark publication in the field, this carefully edited collection emphasizes statistical models and methods likely to endure in the future. Whether involved in the development of statistical methodology or the analysis of longitudinal data, readers will gain new perspectives on the field.

The Book of Why Cambridge University Press

'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.

A Dialogue with the Social Sciences CRC Press

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

Emergent Spacetime and the Causal Metric Hypothesis Elsevier

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

area.

Handbook of Causal Analysis for Social Research Cambridge University Press

Agent-based Models and Causal Inference
Scholars of causal inference have given little credence to the possibility that ABMs could be an important tool in warranting causal claims. Manzo's book makes a convincing case that this is a mistake. The book starts by describing the impressive progress that ABMs have made as a credible methodology in the last several decades. It then goes on to compare the inferential threats to ABMs versus the traditional methods of RCTs, regression, and instrumental variables showing that they have a common vulnerability of being based on untestable assumptions. The book concludes by looking at four examples where an analysis based on ABMs complements and augments the evidence for specific causal claims provided by other methods. Manzo has done a most convincing job of showing that ABMs can be an important resource in any researcher's tool kit. Christopher Winship, Diker-Tishman Professor of Sociology, Harvard University, USA Agent-based Models

and Causal Inference delivers an insightful investigation into the conditions under which different quantitative methods can legitimately hold to be able to establish causal claims. The book compares agent-based computational methods with randomized experiments, instrumental variables, and various types of causal graphs. Organized in two parts, Agent-based Models and Causal Inference connects the literature from various fields, including causality, social mechanisms, statistical and experimental methods for causal inference, and agent-based computation models to help show that causality means different things within different methods for causal analysis, and that persuasive causal claims can only be built at the intersection of these various methods. Readers will also benefit from the inclusion of: A thorough comparison between agent-based computation models to randomized experiments, instrumental variables, and several types of causal graphs A compelling argument that observational and experimental methods are not qualitatively superior to simulation-based methods in their ability to establish causal claims Practical discussions of how statistical, experimental

and computational methods can be combined to produce reliable causal inferences Perfect for academic social scientists and scholars in the fields of computational social science, philosophy, statistics, experimental design, and ecology, Agent-based Models and Causal Inference will also earn a place in the libraries of PhD students seeking a one-stop reference on the issue of causal inference in agent-based computational models.

Causal Inference for Observational and Experimental Data John Wiley & Sons

Causal analytics methods can revolutionize the use of data to make effective decisions by revealing how different choices affect probabilities of various outcomes. This book presents and illustrates models, algorithms, principles, and software for deriving causal models from data and for using them to optimize decisions with uncertain outcomes. It discusses how to describe and summarize situations; detect changes; evaluate effects of policies or interventions; learn what works best under different conditions; predict values of as-yet unobserved quantities from available data; and identify the most likely explanations for observed outcomes, including surprises and anomalies. The book resents practical techniques for causal modeling and analytics that practitioners can apply to improve understanding of how choices affect probabilities of consequences

and, based on this understanding, to recommend choices that are more likely to accomplish their intended objectives. The book begins with a survey of modern analytics methods, focusing mainly on techniques useful for decision, risk, and policy analysis. Chapter 2 introduces free in-browser software, including the Causal Analytics Toolkit (CAT) software, to enable readers to perform the analyses described and to apply modern analytics methods easily to their own data sets. Chapters 3 through 11 show how to apply causal analytics and risk analytics to practical risk analysis challenges, mainly related to public and occupational health risks from pathogens in food or from pollutants in air. Chapters 12 through 15 turn to broader questions of how to improve risk management decision-making by individuals, groups, organizations, institutions, and multi-generation societies with different cultures and norms for cooperation. These chapters examine organizational learning, community resilience, societal risk management, and intergenerational collaboration and justice in managing risks.

Statistical Rethinking Cambridge University Press

Causal Inference in Statistics A Primer John Wiley & Sons

Agent-based Models and Causal Inference Princeton University Press

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.

Linear Causal Modeling with Structural Equations CreateSpace

There exist applications in many research areas including (but not limited to) economics dealing with causation that are analyzed using multi-equation mathematical models. This book develops and describes a formal treatment of causation in such mathematical models. It serves to replace existing treatments of causation, which almost without exception are vague and otherwise unsatisfactory. Development of theory is accompanied here by extensive analysis of examples drawn from the economics literature: treatment evaluation, potential outcomes, applied econometrics. The theory outlined here will be extremely useful in economics and such related fields as biology and biomedicine.

Logic Programming and Nonmonotonic Reasoning Causal Inference in Statistics A Primer

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, statistical associations, actions and observations. The book will open the way for including causal analysis in the standard curriculum of statistics, artificial intelligence ...

Causal Analytics for Applied Risk Analysis Basic Books

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

Statistical Models and Causal Inference SAGE

This book evaluates and suggests potentially critical improvements to causal set theory, one of the best-motivated approaches to the outstanding problems of fundamental physics. Spacetime structure is of central importance to physics beyond general relativity and the standard model. The causal metric hypothesis treats causal relations as the basis of this structure. The book develops the consequences of this hypothesis under the assumption of a fundamental scale, with smooth spacetime geometry viewed as emergent. This approach resembles causal set theory, but differs in important ways; for example, the relative viewpoint, emphasizing relations between pairs of events, and relationships between pairs of histories, is central. The book culminates in a dynamical law for quantum spacetime, derived via generalized path summation.

Multi-physics Modeling of Technological Systems Springer

Causal reasoning is one of our most central

cognitive competencies, enabling us to adapt to our world. Causal knowledge allows us to predict future events, or diagnose the causes of observed facts. We plan actions and solve problems using knowledge about cause-effect relations. Although causal reasoning is a component of most of our cognitive functions, it has been neglected in cognitive psychology for many decades. The Oxford Handbook of Causal Reasoning offers a state-of-the-art review of the growing field, and its contribution to the world of cognitive science. The Handbook begins with an introduction of competing theories of causal learning and reasoning. In the next section, it presents research about basic cognitive functions involved in causal cognition, such as perception, categorization, argumentation, decision-making, and induction. The following section examines research on domains that embody causal relations, including intuitive physics, legal and moral reasoning, psychopathology, language, social cognition, and the roles of space and time. The final section presents research from neighboring fields that study developmental, phylogenetic, and cultural differences in causal cognition. The chapters, each written by renowned researchers in their field, fill in the gaps of many cognitive psychology textbooks, emphasizing the crucial role of causal structures in our everyday lives.

This Handbook is an essential read for students and researchers of the cognitive sciences, including cognitive, developmental, social, comparative, and cross-cultural psychology; philosophy; methodology; statistics; artificial intelligence; and machine learning.

Causal Inference in Statistics CRC Press

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.

Applied Bayesian Modeling and Causal Inference from Incomplete-Data Perspectives
SAGE

Emphasizing causation as a functional relationship between variables that describe objects, Linear Causal Modeling with Structural Equations integrates a general philosophical theory of causation with structural equation modeling (SEM) that concerns the special case of linear causal relations. In addition to describing how the

functional relation concept may be generalized to treat probabilistic causation, the book reviews historical treatments of causation and explores recent developments in experimental psychology on studies of the perception of causation. It looks at how to perceive causal relations directly by perceiving quantities in magnitudes and motions of causes that are conserved in the effects of causal exchanges. The author surveys the basic concepts of graph theory useful in the formulation of structural models. Focusing on SEM, he shows how to write a set of structural equations corresponding to the path diagram, describes two ways of computing variances and covariances of variables in a structural equation model, and introduces matrix equations for the general structural equation model. The text then discusses the problem of identifying a model, parameter estimation, issues involved in designing structural equation models, the application of confirmatory factor analysis, equivalent models, the use of instrumental variables to resolve issues of causal direction and mediated causation, longitudinal modeling, and nonrecursive

models with loops. It also evaluates models on several dimensions and examines the polychoric and polyserial correlation coefficients and their derivation. Covering the fundamentals of algebra and the history of causality, this book provides a solid understanding of causation, linear causal modeling, and SEM. It takes readers through the process of identifying, estimating, analyzing, and evaluating a range of models. How People Think About the World and Its Alternatives Springer

This book constitutes the refereed proceedings of the 7th International Conference on Logic Programming and Nonmonotonic Reasoning, LPNMR 2004, held in Fort Lauderdale, Florida, USA in January 2004. The 24 revised full papers presented together with 8 system descriptions were carefully reviewed and selected for presentation. Among the topics addressed are declarative logic programming, nonmonotonic reasoning, knowledge representation, combinatorial search, answer set programming, constraint programming, deduction in ontologies, and planning.

A User's Guide to Path Analysis, Structural Equations and Causal Inference with R

Springer Science & Business Media

This book brings together a collection of

articles on statistical methods relating to missing data analysis, including multiple imputation, propensity scores, instrumental variables, and Bayesian inference. Covering new research topics and real-world examples which do not feature in many standard texts. The book is dedicated to Professor Don Rubin (Harvard). Don Rubin has made fundamental contributions to the study of missing data. Key features of the book include:

Comprehensive coverage of an important area for both research and applications. Adopts a pragmatic approach to describing a wide range of intermediate and advanced statistical techniques. Covers key topics such as multiple imputation, propensity scores, instrumental variables and Bayesian inference. Includes a number of applications from the social and health sciences. Edited and authored by highly respected researchers in the area.

Oxford University Press

A Turing Award-winning computer scientist and statistician shows how understanding causality has revolutionized science and will revolutionize artificial intelligence "Correlation is not causation." This mantra, chanted by scientists for more than a

century, has led to a virtual prohibition on causal talk. Today, that taboo is dead. The causal revolution, instigated by Judea Pearl and his colleagues, has cut through a century of confusion and established causality -- the study of cause and effect -- on a firm scientific basis. His work explains how we can know easy things, like whether it was rain or a sprinkler that made a sidewalk wet; and how to answer hard questions, like whether a drug cured an illness. Pearl's work enables us to know not just whether one thing causes another: it lets us explore the world that is and the worlds that could have been. It shows us the essence of human thought and key to artificial intelligence. Anyone who wants to understand either needs *The Book of Why*.