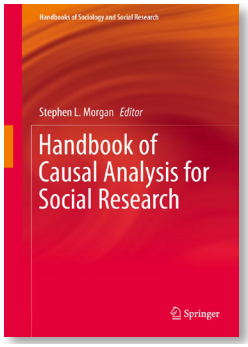

Stephen L. Morgan (Editor) (2013):
Handbook of Causal Analysis for Social Research
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Causality is not only a core topic in the philosophy of science and the hard sciences. Since their very beginning social scientists were deeply interested in the possibilities and pitfalls of causal inference. Controversies on the topic were and are particularly intense in the social sciences as the particularities of the field raise additional problems and often hamper the approximation to the heuristic ideal of the randomized controlled experiment. Over time different methods like correlational, path, regression, and event history analysis were in vogue. In recent decades the literature on causality is moving fast forward, receiving important input both from theorists interested in explanation and social mechanisms and methodologists developing on statistical concepts of causality and specific identification/estimation techniques.

The Handbook of Causal Analysis for Social Research, edited by Stephen Morgan and with chapters by leading experts in the field, both reflects this long history of causal inference in the social sciences and gives an overview of the current state of the art. The volume has 19 chapters divided into six parts.

In Part I "Background and Approaches to Analysis" Sondra N. Barringer, Scott R. Eliason, and Erin Leahey give a concise review of the theoretical, statistical, and econometric literature on causality linking the concept back to classical work (e.g., by Mill, Hume, and Weber) and presenting old and new variants of causal modeling. Jeremy Freese and J. Alex Kevern give background on types of causes, introduce several distinctions (manipulable/preventable, proximal/distal, necessary/sufficient; proximate/ultimate), and highlight that causes can differ in their importance.

In Part II "Design and Modeling Choices" Herbert L. Smith proposes a design-based identification approach "de-emphasizing computational statistical considerations in favor of observational frames" (p. 47), and explains why the experiment is commonly regarded as the "gold standard". However, Smith also emphasizes that "the experiment itself is more ideal—model—than method in the social sciences." (p. 57) In chapter 5 James Mahoney, Gary Goertz, and Charles C. Ragin com-

pare additive, linear causal models, commonly used by statistical researchers, and logic-based causal models, commonly used by set-theoretic researchers, seeking to clarify fundamental dissimilarities on the conceptual level rather than to unify both approaches. David J. Harding and Kristin S. Seefeldt pledge in Chapter 6 "Mixed Methods and Causal Analysis" for a combination of quantitative and qualitative methodologies to strengthen causal analyses, for example by elucidating selection processes, intervening mechanisms, and sources of heterogeneity.

Part III "Beyond Conventional Regression Models" zooms in on selected statistical methods. Glenn Firebaugh, Cody Warner, and Michael Massoglia give an overview of methods for longitudinal data analysis and emphasize the advantages of fixed effects and hybrid models. The contribution of Hui Zheng, Yang Yang, and Kenneth C. Land deals with heteroscedastic regression models which allow the researchers to directly model heteroscedasticity. Tim F. Liao presents methods to analyze group differences (as regards linear predictors and underlying distributions) in generalized linear models. Richard Breen and Kristian Bernt Karlson discuss the specific challenges of non-linear probability models in identification and estimation of causal effects as well as techniques to circumvent these problems. Jennie E. Brand and Juli Simon Thomas raise awareness for the well-known, but in practice often neglected problem of treatment-effect heterogeneity for causal inference and "encourage researchers to routinely examine treatment-effect heterogeneity with the same rigor they devote to pretreatment heterogeneity." (p. 189) Xiaolu Wang and Michael E. Sobel conclude this section of the book with a chapter on a topic gaining in prominence in recent years: causal mediation analysis. They show that identification of indirect effects often rests on implausible assumptions and sketch alternatives to the common practice.

Part IV "Systems of Causal Relationships" heavily draws on graphical causal models, which are introduced by Felix Elwert with a special focus on endogenous selection bias caused by collider variables. Carly R. Knight and Christopher Winship illustrate the analytical potential of directed acyclic graphs for the study of causal mechanisms. After discussing conceptions of causal mechanisms the authors explicate preconditions for a successful front-door analysis and give hints how identification issues can be solved. Finally, Kenneth A. Bollen and Judea Pearl aim at clearing persistent myths and misunderstandings about structural equation modeling and rehabilitating the method. They "conclude that the current capabilities of SEMs to formalize and implement causal inference tasks are indispensable; its potential to do more is even greater." (p. 301)

Part V "Influence and Interference" consists of two chapters on social interactions. The presence of social ties complicates identification of causal effects due to self-selection and violations of the stable unit treatment value assumption. In Chapter 16 Guanglei Hong and StephenW. Raudenbush present models which take the social

fact of interference among participants into account and help to relax the often overly restrictive and unrealistic SUTVA. In Chapter 17 Tyler J. VanderWeele and Weihua An explicate that the separation of social influence, homophily, and environmental confounding is one of the major tasks in social network analysis which can be tackled with longitudinal data.

The last part of the book, VI "Retreat from Effect Identification" begins with an overview by Markus Gangl of instrumental variables, sensitivity analysis, and nonparametric bounds on treatment effects. As the author shows these methods for partial identification help researchers to better understand and communicate the robustness of their results. Finally, Richard A. Berk et al. caption their chapter with the statement "What You Can Learn from Wrong Causal Models". They do not argue that wrong model assumption do not compromise causal inference, but claim that "causal thinking can help inform how a statistical approximation is specified, and […] can be instrumental when results need to be interpreted" (p. 423)

As this short summary illustrates the handbook covers a wide range of important topics of causal inference and surely is an invaluable resource for students and researchers interested in the topic. Thereby, the handbook complements the excellent and influential textbook *Counterfactuals and Causal Inference* by Morgan and Winship (2015, 2nd ed.). On the one hand, many of the contributors also draw heavily on the counterfactual model of causal inference (Rubin) and graphical models of causality (Pearl). On the other hand, the volume gives more room to unresolved discussions and conflicting positions than is possible in a textbook. This reflects that the "target audiences" of the handbook are "advanced graduate students and faculty researchers in sociology" (p. v). As always in edited volumes, although most chapters follow a common structure, the analytical rigor and the required formal background vary. Thus, probably not all chapters are equally accessible to graduate students and – to guard against misunderstandings – the handbook also gives no guidance how to conduct analyses with a specific statistical software package. Nonetheless, due to the exceptionally high quality, the clarity of presentation, and the many examples the handbook is well-suited for teaching methodology to advanced classes. Finally, I have no doubt that the volume will fulfil its main aim: it will bring the field of causal inference forward and raise the methodological rigor of social science research in general.

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