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Titolo	Causality in a social world : moderation, meditation and spill-over / / Guanglei Hong
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Nota di contenuto	Cover; Table of Contents; Title page; Preface; Part I: OVERVIEW; 1 Introduction; 1.1 Concepts of moderation, mediation, and spill-over; 1.2 Weighting methods for causal inference; 1.3 Objectives and organization of the book; 1.4 How is this book situated among other publications on related topics?; References; 2 Review of causal inference concepts and methods; 2.1 Causal inference theory; 2.2 Applications to Lord's paradox and Simpson's paradox; 2.3 Identification and estimation; Appendix 2.1: Potential bias in a prima facie effect Appendix 2.2: Application of the causal inference theory to Lord's paradox References; 3 Review of causal inference designs and analytic methods; 3.1 Experimental designs; 3.2 Quasi-experimental designs; 3.3 Statistical adjustment methods; 3.4 Propensity score; Appendix 3.A: Potential bias due to the omission of treatment-by-covariate interaction; Appendix 3.B: Variable selection for the propensity score model; References; 4 Adjustment for selection bias through weighting; 4.1 Weighted estimation of population parameters in survey sampling

4.2 Weighting adjustment for selection bias in causal inference 4.3 MMWS; Appendix 4.A: Proof of MMWS-adjusted mean observed outcome being unbiased for the population average potential outcome; Appendix 4.B: Derivation of MMWS for estimating the treatment effect on the treated; Appendix 4.C: Theoretical equivalence of MMWS and IPTW; Appendix 4.D: Simulations comparing MMWS and IPTW under misspecifications of the functional form of a propensity score model; References; 5 Evaluations of multivalued treatments; 5.1 Defining the causal effects of multivalued treatments
5.2 Existing designs and analytic methods for evaluating multivalued treatments 5.3 MMWS for evaluating multivalued treatments; 5.4 Summary; Appendix 5.A: Multiple IV for evaluating multivalued treatments; References; Part II: MODERATION; 6 Moderated treatment effects: concepts and existing analytic methods; 6.1 What is moderation?; 6.2 Experimental designs and analytic methods for investigating explicit moderators; 6.3 Existing research designs and analytic methods for investigating implicit moderators
Appendix 6.A: Derivation of bias in the fixed-effects estimator when the treatment effect is heterogeneous in multisite randomized trials Appendix 6.B: Derivation of bias in the mixed-effects estimator when the probability of treatment assignment varies across sites; Appendix 6.C: Derivation and proof of the population weight applied to mixed-effects models for eliminating bias in multisite randomized trials; References; 7 Marginal mean weighting through stratification for investigating moderated treatment effects; 7.1 Existing methods for moderation analyses with quasi-experimental data
7.2 MMWS estimation of treatment effects moderated by individual or contextual characteristics

Sommario/riassunto

Causality in a Social World introduces innovative new statistical research and strategies for investigating moderated intervention effects, mediated intervention effects, and spill-over effects using experimental or quasi-experimental data. The book uses potential outcomes to define causal effects, explains and evaluates identification assumptions using application examples, and compares innovative statistical strategies with conventional analysis methods. Whilst highlighting the crucial role of good research design and the evaluation of assumptions required for identifying causal effects in

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Nota di contenuto	Handbook of Hydrogen Storage: New Materials for Future Energy Storage; Foreword; Contents; Preface; List of Contributors; 1 Storage of Hydrogen in the Pure Form; 1.1 Introduction; 1.2 Thermodynamic State and Properties; 1.2.1 Variables of State; 1.2.2 T-s-Diagram; 1.2.2.1 Joule-Thomson Coefficient; 1.2.3 Properties; 1.3 Gaseous Storage; 1.3.1 Compression and Expansion; 1.3.2 Tank Systems; 1.3.3 High Pressure Infrastructure; 1.4 Liquid Storage; 1.4.1 Liquefaction; 1.4.2 Thermodynamic Analysis; 1.4.2.1 Pressure Build-Up; 1.4.2.2 Boil-Off; 1.4.2.3 Cooling and Filling; 1.4.2.4 Back-Gas 1.4.3 Tank Systems1.4.4 Distribution Facilities; 1.5 Hybrid Storage; 1.5.1 Supercritical Storage; 1.5.2 Hydrogen Slush; 1.6 Comparison of

Energy Densities; 1.7 Conclusion; References; 2 Physisorption in Porous Materials; 2.1 Introduction; 2.2 Carbon Materials; 2.3 Organic Polymers; 2.4 Zeolites; 2.5 Coordination Polymers; 2.6 Conclusions; References; 3 Clathrate Hydrates; 3.1 Introduction; 3.2 Clathrate Hydrate Structures; 3.3 Hydrogen Clathrate Hydrate; 3.4 Kinetic Aspects of Hydrogen Clathrate Hydrate; 3.5 Modeling of Hydrogen Clathrate Hydrates; 3.6 Future of Hydrogen Storage; References
4 Metal Hydrides4.1 Introduction; 4.2 Elemental Hydrides; 4.2.1 Ionic or Saline Hydrides; 4.2.2 Covalent Hydrides; 4.2.3 Metallic Hydrides; 4.3 Thermodynamics of Metal Hydrides; 4.3.1 Introduction; 4.3.2 Low Concentration; 4.3.3 High Concentration; 4.4 Intermetallic Compounds; 4.4.1 Thermodynamics; 4.4.1.1 Miedema's Model; 4.4.1.2 Semi-Empirical Band Structure Model; 4.4.2 Crystal Structure; 4.4.3 Electronic Structure; 4.5 Practical Considerations; 4.5.1 Synthesis; 4.5.2 Activation; 4.5.3 Hysteresis; 4.5.4 Plateau Slope; 4.5.5 Reversible Capacity; 4.5.6 Hydrogenation Kinetics
4.5.7 Cycle Life4.5.8 Decrepitation; 4.6 Metal Hydrides Systems; 4.6.1 AB5; 4.6.2 TiFe; 4.6.3 AB2 Laves Phases; 4.6.4 BCC Solid Solution; 4.7 Nanocrystalline Mg and Mg-Based Alloys; 4.7.1 Hydrogen Sorption Kinetics; 4.7.2 Reduction of the Heat of Formation; 4.7.3 Severe Plastic Deformation Techniques; 4.8 Conclusion; 4.8.1 Alloys Development; 4.8.2 Synthesis; 4.8.3 System Engineering; References; 5 Complex Hydrides; 5.1 Introduction; 5.2 Complex Borohydrides; 5.2.1 Introduction; 5.2.2 Stability of Metal Borohydrides; 5.2.3 Decomposition of Complex Borohydrides
5.2.4 Lithium Borohydride, LiBH45.2.4.1 Synthesis and Crystal Structure; 5.2.4.2 Decomposition of LiBH4; 5.2.5 Sodium Borohydride, NaBH4; 5.2.5.1 Synthesis and Crystal Structure; 5.2.5.2 Decomposition of NaBH4; 5.2.6 Potassium Borohydride KBH4; 5.2.7 Beryllium Borohydride Be(BH4)2; 5.2.8 Magnesium Borohydride Mg(BH4)2; 5.2.8.1 Synthesis and Crystal Structure; 5.2.8.2 Decomposition; 5.2.9 Calcium Borohydride Ca(BH4)2; 5.2.9.1 Synthesis and Crystal Structure; 5.2.9.2 Decomposition; 5.2.10 Aluminum Borohydride Al(BH4)3; 5.2.10.1 Synthesis and Crystal Structure; 5.2.10.2 Decomposition
5.2.11 Zinc Borohydride Zn(BH4)2

Sommario/riassunto

Owing to the limited resources of fossil fuels, hydrogen is proposed as an alternative and environment-friendly energy carrier. However, its potential is limited by storage problems, especially for mobile applications. Current technologies, as compressed gas or liquefied hydrogen, comprise severe disadvantages and the storage of hydrogen in lightweight solids could be the solution to this problem.Since the optimal storage mechanism and optimal material have yet to be identified, this first handbook on the topic provides an excellent overview of the most probable candidates, highlighting bo