Causality: Readings in Statistics and Econometrics

Hedibert F. Lopes, INSPER

http://www.hedibert.org/current-teaching/#tab-causality

Annotated Bibliography

Contents

1 Books and Special issues

1.1 *Journal of Econometrics* (1988), Volume 39, Issues 1-2

`http://www.sciencedirect.com/science/journal/03044076/39/1`

1. Causality and causal laws in economics (Zellner)
2. On the interpretation and observation of laws (Pratt and Schlaifer)
3. Probability and causation (Skyrms)
4. Causality tests and observationally equivalent representations of econometric models (Basmann)
5. Further thoughts on testing for causality with econometric models (Swamy and Von Zur Muehlen)
6. Causal ordering, comparative statics, and near decomposability (Simon and Iwasaki)
7. Latent variables, causal models and overidentifying constraints (Glymour and Spirtes)
8. Some recent development in a concept of causality (Granger)
9. Causal relationships and replicability (Poirier)

1.2 Cooper and Glymor (1999) *Computation, Causation, and Discovery.* AAAI Press

`http://cognet.mit.edu/book/computation-causation-and-discovery`

1. An Overview of the Representation and Discovery of Causal Relationships Using Bayesian Networks (Cooper)
2. Prediction and Experimental Design with Graphical Causal Models (Spirtes, Glymour, Scheines, Meek, Fienberg and Slate)
3. Graphs, Structural Models, and Causality (Pearl)
4. A Bayesian Approach to Causal Discovery (Heckerman, Meed and Cooper)
5. Truth is among the Best Explanations: Finding Causal Explanations of Conditional Independence and Dependence (Scheines, Glymour, Spirtes, Meek and Richardson)
6. An Algorithm for Causal Inference in the Presence of Latent Variables and Selection Bias (Spirtes, Meek and Richardson)
7. Automated Discovery of Linear Feedback Models (Richardson and Spirtes)
8. On the Impossibility of Inferring Causation from Association without Background Knowledge (Robins and Wasserman)
9. On the Possibility of Inferring Causation from Association without Background Knowledge (Glymour, Spirtes and Richardson)
10. Rejoinder to Glymour, Spirtes, and Richardson (Robins and Wasserman)
11. Response to Rejoinder (Glymour, Spirtes and Richardson)
12. Testing and Estimation of Direct Effects by Reparameterizing Directed Acyclic Graphs with Structural Nested Models (Robins)
13. A Clinician's Tool for Analyzing Noncompliance (Maxwell, Chickering and Pearl)
14. Estimating Latent Causal: Influences: TETRAD II Model Selection and Bayesian Parameter Estimation (Scheines)
15. Exploring Hypothesis Space: Examples from Organismal Biology (Shipley)
16. In-Flight Calibration of Satellite Ion Composition Data Using Artificial Intelligence Methods (Waldemark and Norqvist)
17. Causal Modeling of Spectral Data: A New Tool to Study Nonlinear Processes (Liszka)
18. Modeling Corn Exports and Exchange Rates with Directed Graphs and Statistical Loss Functions (Akleman, Bessler and Burton)
19. Causal Inferences from Databases: Why Universities Lose Students (Druzdzel and Glymour)

1.3 Spirtes, Glymour and Scheines (2001) *Causation, Prediction, and Search (2nd edition).* Adaptive Computation and Machine Learning series. The MIT Press.

http://www.cs.cmu.edu/afs/cs.cmu.edu/project/learn-43/lib/photoz/.g/scottd/fullbook.pdf

1. Introduction and Advertisement
2. Formal Preliminaries
3. Causation and Prediction: Axioms and Explications
4. Statistical Indistinguishability
5. Discovery Algorithms for Causally Sufficient Structures
6. Discovery Algorithms without Causal Sufficiency
7. Prediction
8. Regression, Causation and Prediction
9. The Design of Empirical Studies
10. The Structure of the Unobserved
11. Elaborating Linear Theories with Unmeasured Variables
12. Open Problems

1.4 Gelman and Meng (2004) *Applied Bayesian Modeling and Causal Inference from Incomplete-Data Perspectives.* Wiley Series in Probability and Statistics.

http://www.stat.columbia.edu/~gelman/rubinbook

1. An overview of methods for causal inference from observational studies (Greenland).
2. Matching in observational studies (Rosenbaum).
3. Estimating causal effects in nonexperimental studies (Dehejia).
4. Medication cost sharing and drug spending in Medicare (Adams).
5. A comparison of experimental and observational data analyses (Hill, Reiter and Zanutto).
6. Fixing broken experiments using the propensity score (Sacerdote).
7. The propensity score with continuous treatments (Hirano and Imbens).
8. Causal inference with instrumental variables (Zhang).
9. Principal stratification (Frangakis).
10. Nonresponse adjustment in government statistical agencies: constraints, inferential goals, and robustness issues (Eltinge).
11. Bridging across changes in classification systems (Schenker).
12. Representing the Census undercount by multiple imputation of households (Zaslavsky).
13. Statistical disclosure techniques based on multiple imputation (Little, Liu and Raghunathan).
14. Designs producing balanced missing data: examples from the National Assessment of Educational Progress (Thomas).
15. Propensity score estimation with missing data (D'Agostino Jr).
16. Sensitivity to nonignorability in frequentist inference (Ma and Heitjan).
17. Statistical modeling and computation (Titterington).
18. Treatment effects in before-after data (Gelman).
19. Multimodality in mixture models and factor models (Loken).
20. Modeling the covariance and correlation matrix of repeated measures (Boscardin and Zhang).
21. Robit regression: a simple robust alternative to logistic and probit regression (Liu).
22. Using EM and data augmentation for the competing risks model (Craiu and Duchesne).
23. Mixed effects models and the EM algorithm (Vaida, Meng and Xu).
24. The sampling/importance resampling algorithm (Li).
25. Whither applied Bayesian inference? (Carlin).
26. Efficient EM-type algorithms for fitting spectral lines in high-energy astrophysics (van Dyk and Park).
27. Improved predictions of lynx trappings using a biological model (Reilly and Zeringue).
28. Record linkage using finite mixture models (Larsen).
29. Identifying likely duplicates by record linkage in a survey of prostitutes (Belin, Ishwaran, Duan, Berry and Kanouse).
30. Applying structural equation models with incomplete data (Stern and Jeon).
31. Perceptual scaling (Wu, Guo and Zhu).

1.5 Dawid (2007) *Fundamentals of Statistical Causality.* RSS/EPSRC Graduate Training Programme, University of Sheffield.

https://www.ucl.ac.uk/statistics/research/pdfs/rr279.pdf

1. What's So Hard About It?
2. Causal Questions
3. Formal Frameworks
4. Some Assumptions
5. Conditional Independence
6. Directed Acyclic Graphs
7. Causal Interpretations Of DAGs
8. Computing Causal Effects
9. Confounding And Sufficient Covariates
10. Reduction Of Sufficient Covariate
11. Instrumental Variables
12. Effect Of Treatment On The Treated
13. Dynamic Treatment Strategies

1.6 Morgan and Winship (2007) *Counterfactuals and Causal Inference: Methods and Principles for Social Research (2nd edition).* Cambridge University Press.

https://archivocienciassociales.files.wordpress.com/2015/04/s-l-morgan-c-winship-counterfactuals-and-causal-inference.pdf

1. Introduction
2. Counterfactuals and the potential-outcome model
3. Causal graphs
4. Models of causal exposure and identification criteria for conditioning estimators
5. Matching estimators of causal effects
6. Regression estimators of causal effects
7. Weighted regression estimators of causal effects
8. Self-selection, heterogeneity, and causal graphs
9. Instrumental-variable estimators of causal effects
10. Mechanisms and causal explanation
11. Repeated observations and the estimation of causal effects
12. Distributional assumptions, set identification, and sensitivity analysis
13. Counterfactuals and the future of empirical research in observational social science.

1.7 Angrist and Pischke (2008) *Mostly Harmless Econometrics: An Empiricist's Companion*

http://egei.vse.cz/english/wp-content/uploads/2012/08/mostly+harmeless+econometrics.pdf

1. Questions about *Questions*
2. The Experimental Ideal
3. Making Regression Make Sense
4. Instrumental Variables in Action: Sometimes You Get What You Need
5. Parallel Worlds: Fixed Effects, Differences-in-differences, and Panel Data
6. Getting a Little Jumpy: Regression Discontinuity Designs
7. Quantile Regression
8. Nonstandard Standard Error Issues

1.8 Pearl (2009) *Causality: Models, Reasoning and Inference (2nd Edition).* Cambridge University Press.

http://bayes.cs.ucla.edu/BOOK-2K

1. Introduction to probabilities, graphs, and causal models
2. A theory of inferred causation
3. Causal diagrams and the identification of causal effects
4. Actions, plans, and direct effects
5. Causality and structural models in social science and economics
6. Simpson's paradox, confounding, and collapsibility
7. The logic of structure-based counterfactuals
8. Imperfect experiments: bounding effects and counterfactuals
9. Probability of causation: interpretation and identification
10. The actual cause.

1.9 Schroeder (2010) *Accounting and Causal Effects: Econometric Challenges.* Springer.

http://library.manhesabdaram.com/uploads/_/_-1407652821.pdf

1. Introduction
2. Accounting choice
3. Linear models
4. Loss functions and estimation
5. Discrete choice models
6. Nonparametric regression
7. Repeated-sampling inference
8. Overview of endogeneity
9. Treatment effects: ignobility
10. Treatment effects: IV
11. Marginal treatment effects
12. Bayesian treatment effects
13. Informed priors

1.10 Berzuini, Dawid and Bernardinelli (2012) *Causality: Statistical Perspectives and Applications.* Wiley.

http://www.wiley.com/WileyCDA/WileyTitle/productCd-0470665564.html

1. Statistical causality: Some historical remarks (Cox)
2. The language of potential outcomes (Sjölander)
3. Structural equations, graphs and interventions (Shpitser)
4. The decision-theoretic approach to causal inference (Dawid)
5. Causal inference as a prediction problem: Assumptions, identification and evidence synthesis (Greenland)
6. Graph-based criteria of identifiability of causal questions (Shpitser)
7. Causal inference from observational data: A Bayesian predictive approach (Arjas)
8. Assessing dynamic treatment strategies (Berzuini, Dawid and Didelez)
9. Causal effects and natural laws: Towards a conceptualization of causal counterfactuals for nonmanipulable exposures, with application to the effects of race and sex (VanderWeele and Hernán)
10. Cross-classifications by joint potential outcomes (Sjölander)
11. Estimation of direct and indirect effects (Vansteelandt)
12. The mediation formula: A guide to the assessment of causal pathways in nonlinear models (Pearl)
13. The sufficient cause framework in statistics, philosophy and the biomedical and social sciences (VanderWeele)
14. Analysis of interaction for identifying causal mechanisms (Berzuini, Dawid, Zhang and Parkes)
15. Ion channels as a possible mechanism of neurodegeneration in multiple sclerosis (Bernardinelli, Berzuini, Foco and Pastorino)

16. Supplementary variables for causal estimation (Ramsahai)
17. Time-varying confounding: Some practical considerations in a likelihood framework (Daniel, Stavola and Cousens)
18. "Natural experiments" as a means of testing causal inferences (Rutter)
19. Nonreactive and purely reactive doses in observational studies (Rosenbaum)
20. Evaluation of potential mediators in randomised trials of complex interventions (Emsley and Dunn)
21. Causal inference in clinical trials (Fischer and White)
22. Causal inference in time series analysis (Eichler)
23. Dynamic molecular networks and mechanisms in the biosciences: A statistical framework (Bowsher)

1.11 Morgan (2013) *Handbook of Causal Analysis for Social Research.* Springer.

`http://link.springer.com/book/10.1007%2F978-94-007-6094-3`

1. Introduction (Morgan)
2. A History of Causal Analysis in the Social Sciences (Barringer, Eliason and Leahey)
3. Types of Causes (Freese and Kevern)
4. Research Design: Toward a Realistic Role for Causal Analysis (Smith)
5. Causal Models and Counterfactuals (Mahoney, Goertz and Ragin)
6. Mixed Methods and Causal Analysis (Harding and Seefeldt)
7. Fixed Effects, Random Effects, and Hybrid Models for Causal Analysis (Firebaugh, Warner and Massoglia)
8. Heteroscedastic Regression Models for the Systematic Analysis of Residual Variances (Zheng, Yang and Land)
9. Group Differences in Generalized Linear Models (Liao)
10. Counterfactual Causal Analysis and Nonlinear ProbabilityModels (Breen and Karlson)
11. Causal Effect Heterogeneity (Brand and Thomas)
12. New Perspectives on Causal Mediation Analysis (Wang and Sobel)
13. Graphical Causal Models (Elwert)
14. The Causal Implications of Mechanistic Thinking: Identification Using DAGs (Knight and Winship)
15. Eight Myths About Causality and Structural Equation Models (Bollen and Pearl)
16. Heterogeneous Agents, Social Interactions, and Causal Inference (Hong and Raudenbush)
17. Social Networks and Causal Inference (VanderWeele and An)
18. Partial Identification and Sensitivity Analysis (Gangl)
19. What You Can Learn fromWrong Causal Models (Berk, Brown, George, Pitkin, Traskin, Zhang and Zhao)

1.12 Imbens and Rubin (2015) *Causal Inference for Statistics, Social, and Biomedical Sciences: An Introduction.* Cambridge University Press.

`http://www.cambridge.org/us/academic/subjects/statistics-probability/statistical-theory-and-methods/causal-inference-statistics-social-and-biomedical-sciences-introduction?format=HB`

1. The basic framework: potential outcomes, stability, and the assignment mechanism
2. A brief history of the potential-outcome approach to causal inference
3. A taxonomy of assignment mechanisms
4. A taxonomy of classical randomized experiments
5. Fisher's exact P-values for completely randomized experiments
6. Neyman's repeated sampling approach to completely randomized experiments
7. Regression methods for completely randomized experiments
8. Model-based inference in completely randomized experiments
9. Stratified randomized experiments
10. Paired randomized experiments
11. Case study: an experimental evaluation of a labor-market program
12. Unconfounded treatment assignment
13. Estimating the propensity score
14. Assessing overlap in covariate distributions
15. Design in observational studies: matching to ensure balance in covariate distributions
16. Design in observational studies: trimming to ensure balance in covariate distributions
17. Subclassification on the propensity score

18. Matching estimators (Card-Krueger data)
19. Estimating the variance of estimators under unconfoundedness
20. Alternative estimands
21. Assessing the unconfoundedness assumption
22. Sensitivity analysis and bounds
23. Instrumental-variables analysis of randomized experiments with one-sided noncompliance
24. Instrumental-variables analysis of randomized experiments with two-sided noncompliance
25. Model-based analyses with instrumental variables
26. Conclusions and extensions.

1.13 Hernan and Robins (2015) *Causal Inference*

`http://www.hsph.harvard.edu/miguel-hernan/causal-inference-book`

1. A definition of causal effect
2. Randomized experiments
3. Observational studies
4. Effect modification
5. Interaction
6. Graphical representation of causal effects
7. Confounding
8. Selection bias
9. Measurement bias
10. Random variability
11. Why model?
12. IP weighting and marginal structural models
13. Standardization and the parametric g-formula
14. G-estimation of structural nested models
15. Outcome regression and propensity scores
16. Instrumental variable estimation
17. Causal survival analysis

1.14 *Econometric Theory* (2015), Volume 31, Issue 01

`http://journals.cambridge.org/action/displayIssue?jid=ECT&volumeId=31&seriesId=0&issueId=01`

1. Trygve Haavelmo at the Cowles Commission (Bjerkholt)
2. Structural models and econometrics (Trygve Haavelmo)
3. Model discovery and Trygve Haavelmo's legacy (Hendry and Johansen)
4. Causal analysis after Haavelmo (Heckman and Pinto)
5. Trygve Haavelmo and the emergence of causal calculus (Pearl)
6. My reminiscences of Trygve Haavelmo at the Cowles Commission (Anderson)

2 Articles

2.1 Articles with discussion

1. Holland (1986) Statistics and causal inference. *JASA*, 81, 945-970.
   Discussants: Rubin (Which Ifs Have Causal Answers), Cox, Glymour (Statistics and Metaphysics), Granger.

2. Pearl (1995) Causal diagrams for empirical research. *Biometrika*, 82, 669-710.
   Discussants: Cox-Wermuth, Dawid, Fienberg, Freedman, Imbens-Rubin, Robins, Rosenbaum, Shafer, Sobel

3. Angrist, Imbens and Rubin (1996) Identification of causal effects using IVs. *JASA*, 91, 444-472.
   Discussants: Robins-Greenland, Heckman, Moffitt, Rosenbaum

4. Dawid (2000) Causal inference without counterfactuals. *JASA*, 95, 407-424.
   Discussants: Cox, Casella, Schwartz, Pearl, Robins-Greenland, Rubin, Shafer, Wasserman

5. Heckman (2005) The scientific model of causality. *Sociological Methodology*, 35, 1-150.
   Discussant: Sobel

6. Rubin (2007) The design versus the analysis of observational studies for causal effects: Parallels with the design of randomized trials. *Statistics in Medicine*, 26, 20-36.

   (a) Shrier (2008) Letter to the editor. *Statistics in Medicine*, 27, 2740-2741.
   (b) Rubin (2008) Author's reply. *Statistics in Medicine*, 27, 2741-2742.
   (c) Pearl (2009) Remarks on the method of propensity scores. *Statistics in Medicine*, 28:1415-1416.
   (d) Sjölander (2009) Propensity scores and M-structures. *Statistics in Medicine*, 28, 1416-1420.
   (e) Shrier (2009) Propensity scores. *Statistics in Medicine*, 28, 1317-1318.
   (f) Rubin (2009) Should observational studies be designed to allow lack of balance in covariate distributions across treatment groups? *Statistics in Medicine*, 28, 1420-1423.
   (g) Pearl (2009) Myth, confusion, and science in causal analysis. Technical Report.

2.2 Articles by Rubin, Angrist, Gelman, Holland, Imbens and Rosenbaum

1. Rubin (1974) Estimating causal effects of treatments in randomized and nonrandomized studies. *Journal of Educational Psychology*, 56, 688-701.
2. Rubin (1978) Bayesian inference for causal effects: The role of randomization *Annals of Statistics*, 6, 34-58.
3. Rosenbaum and Rubin (1983) The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70, 41-55.
4. Rosenbaum (1984) From Association to Causation in Observational Studies: The Role of Tests of Strongly Ignorable Treatment Assignment. *JASA*, 79, 41-48.
5. Holland (1986) Statistics and causal inference (with discussion). *JASA*, 81, 945-970.
6. Rubin (1990) Formal mode of statistical inference for causal effects. *Journal of Statistical Planning and Inference*, 25, 279-292.
7. Angrist and Krueger (1991) Does compulsory school attendance affect earnings? *Quarterly Journal of Economic*, 106, 979-1019.
8. Angrist and Imbens (1995) Two-Stage Least Squares Estimation of Average Causal Effects in Models With Variable Treatment Intensity. *JASA*, 90, 431-442.
9. Angrist, Imbens and Rubin (1996) Identification of causal effects using instrumental variables (with discussion). *JASA*, 91, 444-472.
10. Imbens and Rubin (1997) Bayesian inference for causal effects in randomized experiments with noncompliance. *The Annals of Statistics*, 25, 305-327.
11. Little and Rubin (2000) Causal Effects in Clinical and Epidemiological Studies Via Potential Outcomes: Concepts and Analytical Approaches. *Annual Review of Public Health*, 21, 121-145.
12. Frangakis and Rubin (2002) Principal Stratification in Causal Inference. *Biometrics*, 58, 21-29.
13. Chamberlain and Imbens (2003) Nonparametric Applications of Bayesian Inference. *JBES*, 21, 12-18.
14. Rubin (2004) Teaching Statistical Inference for Causal Effects in Experiments and Observational Studies. *Journal of Educational and Behavioral Statistics*, 29, 343-367.

15. Imbens and Rosenbaum (2005) Robust, Accurate Confidence Intervals with a Weak Instrument: Quarter of Birth and Education. *JRSS-A*, 168, 109-126.
16. Rubin (2005a) Causal Inference Using Potential Outcomes: Design, Modeling, Decisions. *Journal of the American Statistical Association*, 100, 322-331.
17. Rubin (2005b) Bayesian Inference for Causal Effects. In *Handbook of Statistics, Vol. 25.*
18. Rubin and Waterman (2006) Estimating the Causal Effects of Marketing Interventions Using Propensity Score Methodology. *Statistical Science*, 21, 206-222.
19. Imbens and Lemieux (2008) Regression discontinuity designs: A guide to practice. *Journal of Econometrics*, 142, 615-635.
20. Rubin (2008) For objective causal inference, design trumps analysis. *The Annals of Applied Statistics*, 2, 808-840.
21. Imbens and Wooldridge (2009) Recent Developments in the Econometrics of Program Evaluation. *Journal of Economic Literature*, 47, 5-86.
22. Imbens (2010) Better LATE Than Nothing: Some Comments on Deaton (2009) and Heckman and Urzua (2009). *Journal of Economic Literature*, 48, 399-423.
23. Gelman (2011) Causality and Statistical Learning *American Journal of Sociology*, 117, 955-966.
24. Gelman and Imbens (2013) Why ask why? Forward causal inference and reverse causal questions.
25. Imbens (2014) Instrumental Variables: An Econometrician's Perspective. *Statistical Science*, 29, 323-358.
26. Athey and Imbens (2015) Machine Learning Methods for Estimating Heterogeneous Causal Effects.

2.3 Articles by Pearl and Dawid

1. Dawid (1979) Conditional Independence in Statistical Theory. *JRSS-B*, 41, 1-31.
2. Dawid (1984) Probability, Causality and the Empirical World: A Bayes-de Finetti-Popper-Borel Synthesis. *Statistical Science*, 19, 44-57.
3. Balke and Pearl (1995). Counterfactuals and policy analysis in structural models. In Besnard and Hanks, Eds., *Uncertainty in Artificial Intelligence*, Proceedings of the Eleventh Conference. Morgan Kaufmann, San Francisco, 11-18.
4. Pearl (1995) Causal diagrams for empirical research (with discussion). *Biometrika*, 82, 669-710.
5. Greenland, Pearl and Robins (1999) Causal diagrams for epidemiologic research. *Epidemiology*, 10, 37-48.
6. Greenland, Robins and Pearl (1999) Confounding and Collapsibility in Causal Inference. *Statistical Science*, 14, 29-46.
7. Dawid (2000) Causal inference without counterfactuals (with discussion). *JASA*, 95, 407-424.
8. Brito and Pearl (2002) Generalized instrumental variables. In Darwiche and Friedman, Eds. *Uncertainty in Artificial Intelligence*, Proceedings of the Eighteenth Conference. Morgan Kaufmann, San Francisco, 85-93.
9. Pearl (2009) Causal inference in statistics: An overview. *Statistics Surveys*, 3, 96-146.
10. Pearl (2009) Myth, Confusion, and Science in Causal Analysis. Technical Report.
11. Pearl (2010) An Introduction to Causal Inference. *The International Journal of Biostatistics*, 6, 1-61.
12. Pearl (2012) The Causal Foundations of Structural Equation Modeling. In Hoyle, Ed., *Handbook of Structural Equation Modeling.* New York, Guilford Press, pp 68-91.
13. Pearl (2013) Reflections on Heckman and Pinto's "Causal Analysis After Haavelmo". Working paper, Computer Science Department, University of California, Los Angeles.
14. Pearl (2013) Linear Models: A Useful "Microscope" for Causal Analysis. *Journal of Causal Inference*, 1, 155-170.
15. Pearl (2014) The Deductive Approach to Causal Inference. *Journal of Causal Inference*, 2, 115-129.
16. Bollen and Pearl (2013) Eight myths about causality and structural equation models. In Morgan (Ed.) *Handbook of Causal Analysis for Social Research*, Chapter 15, 301-328. Springer.
17. Chen and Pearl (2013) Regression and Causation: A Critical Examination of Six Econometrics Textbooks. *Real-World Economics Review*, 65, 2-20.
18. Chen, Tian and Pearl (2014) Testable Implications of Linear Structural Equation Models. *Proceedings of AAAI-14* (to appear).
19. Bareinboim and Pearl (2015) Causal inference from big data: Theoretical foundations and the data-fusion problem. *Proceedings of the National Academy of Sciences.*
20. Chen and Pearl (2015) Graphical Tools for Linear Structural Equation Modeling. *Psychometrica* (forthcoming).

2.4 Articles by Heckman

1. Heckman (1979) Sample Selection Bias as a Specification Error. *Econometrica*, 47, 153-161.
2. Heckman and Robb (1986) Alternative methods for solving the problem of selection bias in evaluating the impact of treatments on outcomes. In Wainer, editor, *Drawing Inferences from Self-Selected Samples*, pp. 63-107.
3. Heckman (1989) Causal Inference and Nonrandom Samples *Journal of Educational Statistics*, 14, 159-168.
4. Heckman and Hotz (1989) Choosing among Alternative Nonexperimental Methods for Estimating the Impact of Social Programs: The Case of Manpower Training. *JASA*, 84, 862-874.
5. Heckman (1992) Haavelmo and the Birth of Modern Econometrics: A Review of the History of Econometric Ideas by Mary Morgan. *Journal of Economic Literature*, 30, 876-886.
6. Heckman and Smith (1995) Assessing the Case for Social Experiments. *Journal of Economic Perspectives*, 9, 85-110.
7. Heckman (2000) Causal parameters and policy analysis in economics: a twentieth century retrospective. *The Quarterly Journal of Economics*, 115, 45-97.
8. Florens and Heckman (2003) Causality and Econometrics.Technical Report, University of Chicago Department of Economics.
9. Heckman (2005) The scientific model of causality. *Sociological Methodology*, 35, 1-97.
10. Heckman (2008) Econometric causality. *International Statistical Review*, 76, 1-27.
11. Heckman and Urzua (2009) Comparing IV with Structural Models: What Simple IV Can and Cannot Identify. NBER Working paper 14706.
12. Heckman (2010) Building bridges between structural and program evaluation approaches to evaluating policy. NBER Working paper 16110.
13. Heckman, Lopes and Piatek (2014) Treatment Effects: A Bayesian Perspective. *Econometric Reviews*, 33, 36-67.

2.5 Other articles

1. Glymour, Spirtes and Richardson (1999) On the possibility of inferring causation from association without background knowledge. In Glymour and Cooper, Eds., *Computation, Causation, and Discovery*, 323-331. Cambridge, MIT Press.
2. Robins and Wasserman (1999) On the impossibility of inferring causation from association without background knowledge. I In Glymour and Cooper, Eds., *Computation, Causation, and Discovery*, 305-321. Cambridge, MIT Press.
3. Haavelmo (1943) The statistical implications of a system of simultaneous equations. *Econometrica*, 11, 1-12.
4. Haavelmo (1944) The Probability Approach in Econometrics. *Econometrica*, Vol. 12, Supplement, pp. iii-vi+1-115.
5. Simon (1954) Spurious Correlations: A Causal Interpretation. *JASA*, 49,467-492.
6. Lord (1967) A paradox in the interpretation of group comparisons. *Psychological Bulletin*, 68, 304-305.
7. Geweke (1984) Inference and Causality in Economic Time Series Models. In Griliches and Intriligator, Eds., *Handbook of Econometrics, Volume 2*, 1101-1144, Amsterdam: North-Holland.
8. Pratt and Schlaifer (1984) On the Nature and Discovery of Structure (with discussion). *JASA*, 79, 9-21.
9. Neyman (1990) On the Application of Probability Theory to Agricultural Experiments. Essay on Principles. Section 9. *Statistical Science*, 5, 465-472. Translated and edited by Dabrowska and Speed from the Polish original, which appeared in Roczniki Nauk Rolniczych Tom X (1923) 1-51 (Annals of Agricultural Sciences).
10. Bound, Jaeger, and Baker (1995) Problems with Instrumental Variables Estimation when the Correlation Between the Instruments and the Endogenous Regressors is Weak. *JASA*, 90, 443-450.
11. Winship and Morgan (1999) The Estimation of Causal Effects From Observational Data. *Annual Review of Sociology*, 25, 659-706.
12. Greenland (2002) Causal Analysis in the Health Sciences. In Raftery, Tanner and Wells, Eds, Statistics in the 21st Century. 142-148. Chapman&Hall/CRC.
13. Sobel (2002). Causal Inference in the Social Sciences. In Raftery, Tanner and Wells, Eds, *Statistics in the 21st Century*, 142-148. Chapman&Hall/CRC.
14. Lindley (2002) Seeing and Doing: the conception of causation. *International Statistical Review*, 70, 191-214.
15. Vansteelandt and Goetghebeur (2003) Causal inference with generalized structural mean models. *JRSS-B*, 65, 817-835.
16. Cox an Wermuth (2004) Causality: a statistical view. *International Statistical Review*, 72, 285-305.

17. Spirtes (2005) Graphical models, causal inference, and econometric models.
18. Hoover (2006) Causality in Economics and Econometrics. *An Entry for the New Palgrave Dictionary of Economics.*
19. Moneta (2007) Mediating Between Causes and Probabilities: The Use of Graphical Models in Econometrics. In Williamson and Russo (eds.), *Causality and Probability in the Sciences*, pp 109-129, College Publications, London.
20. Tu, Gunnell and Gilthorpe (2008) Simpson's Paradox, Lord's Paradox, and Suppression Effects are the same phenomenon – the reversal paradox. *Emerging Themes Epidemiol*, Jan 22; 5:2.
21. Deaton (2009) Instruments of development: Randomization in the tropics, and the search for the elusive keys to economic development. NBER Working Paper 14690.
22. Deaton (2010) Instruments, Randomization, and Learning about Development. *Journal of Economic Literature*, 48, 424-455.
23. Lee and Lemieux (2010) Regression Discontinuity Designs in Economics. *Journal of Economic Literature*, 48, 281-355.
24. Spirtes (2010) Introduction to Causal Inference. *Journal of Machine Learning Research*, 11, 1643-1662.
25. Stuart (2010) Matching Methods for Causal Inference: A Review and a Look Forward. *Statistical Science*, 25, 1-21.
26. Chambaz, Drouet and Thalabard (2014) Causality, a Trialogue. *Journal of Causal Inference*, 2,201-241.
27. Ding (2014) A paradox from randomization-based causal inference. `arXiv:1402.0142v3`.
28. Frühwirth-Schnatter, Halla, Posekany, Pruckner and Schober (2014) The Quantity and Quality of Children: A Semi-Parametric Bayesian IV Approach. Discussion paper 8024, Institute for the Study of Labor (IZA).
29. Hoover (2014) On the Reception of Haavelmo's Econometric Thought. *Journal of the History of Economic Thought*, 36, 45-65.
30. Li and Mealli (2014) A Conversation with Donald B. Rubin. *Statistical Science*, 29, 439-457.
31. Moneta and Russo (2014) Causal models and evidential pluralism in econometrics. *Journal of Economic Methodology*, 21, 54-76.
32. Brzeski, Taddy and raper (2015) Causal Inference in Repeated Observational Studies: A Case Study of eBay Product Releases. `arXiv:1509.03940v1`.
33. Spanos (2015) Revisiting Haavelmo's structural econometrics: bridging the gap between theory and data. *Journal of Economic Methodology*, 22, 171-196.

2.6 Regression discontinuity

1. Hahn, Todd and Van der Klaauw (2001) Identification and estimation of treatment effects with a regression-discontinuity design. *Econometrica*, 69, 201-209.
2. Imbens and Lemieux (2008) Regression discontinuity designs: A guide to practice. *Journal of Econometrics*, 142, 615-635.
3. Van Der Klaauw (2008) Regression-Discontinuity Analysis: A Survey of Recent Developments in Economics. *Labour*, 22, 219-245.
4. Lee and Lemieux (2010) Regression Discontinuity Designs in Economics. *Journal of Economic Literature*, 48, 281-355.
5. Rau (2011) Bayesian inference in the regression discontinuity model. Technical report.
6. Chib and Greenberg (2014) Nonparametric Bayes Analysis of the Sharp and Fuzzy Regression Discontinuity Designs. Technical report.
7. Chib and Jacob (2015) Bayesian fuzzy regression discontinuity analysis and returns to compulsory schooling. *Journal of Applied Econometrics.*

2.7 Graphical models

1. Wright (1921) Correlation and Causation. *Journal of Agricultural Research*, 20, 557-585.
2. *Statistical Science*, 1993, volume 9, pages 204-283.
   - Cox and Wermuth, Linear dependences represented by chain graphs, 204-218.
   - Spiegelhalter, Dawid, Lauritzen and Cowell, Bayesian analysis in expert systems, 219-247.
   - Discussion and rejoinder, 248-283.
3. Swanson and Granger (1997) Impulse Response Functions Based on a Causal Approach to Residual Orthogonalization in Vector Autoregressions. *JASA*, 92, 357-367.
4. Lauritzen (2001) Causal inference from graphical models. In Barndorff-Nielsen, Cox and Klüppelberg, Eds., *Complex Stochastic Systems*, 63-107. Chapman and Hall/CRC Press, London/Boca Raton.
5. Lauritzen and Richardson (2002) Chain graph models and their causal interpretation. *JRSS-B*, 64, 321-361.
6. Robins, Scheines, Spirtes and Wasserman (2003) Uniform consistency in causal inference. *Biometrika*, 90, 491-515.
7. Jordan (2004) Graphical models. *Statistical Science*, 19, 140-155.
8. Spirtes (2005) Graphical models, causal inference, and econometric models. *Journal of Economic Methodology*, 12, 1-33.
9. Moneta and Spirtes (2006) Graphical Models for the Identification of Causal Structures in Multivariate Time Series Models. In *Proceedings of the 9th Joint Conference on Information Sciences.*
10. Moneta (2007) Mediating Between Causes and Probabilities: The Use of Graphical Models in Econometrics. In Williamson and Russo (eds.), *Causality and Probability in the Sciences*, pp 109-129, College Publications.

3 URL material

3.1 Graphical models tutorials

- Mohan and Pearl (2012) Graphical Models for Causal Inference
- Lauritzen (2013) Causal Inference from Graphical Models (part 1) (part 2)
- Forcina (2010) Introduction to causal inference without counterfactuals

3.2 Andrew Gelman's blog *Statistical Modeling, Causal Inference, and Social Science*

1. `http://andrewgelman.com`
2. The randomized experiment as gold standard?
   `http://andrewgelman.com/2006/07/07/the_randomized`
3. Resolving disputes between J. Pearl and D. Rubin on causal inference
   `http://andrewgelman.com/2009/07/05/disputes_about`
4. Philip Dawid's explication of Pearl's model, and two ways of thinking about nonrandom sampling
   `http://andrewgelman.com/2009/07/07/philip_dawids_t`
5. More on Pearl's and Rubin's frameworks for causal inference
   `http://andrewgelman.com/2009/07/07/more_on_pearls/`
6. More on Pearl/Rubin, this time focusing on a couple of points
   `http://andrewgelman.com/2009/07/09/more_on_pearlru/`
7. The Roy causal model?
   `http://andrewgelman.com/2013/07/30/the-roy-causal-model`
8. Why ask why? Forward causal inference and reverse causal questions
   `http://andrewgelman.com/2013/11/11/ask-forward-causal-inference-reverse-causal-questions/`

3.3 Judea Pearl's page

`http://bayes.cs.ucla.edu/jp_home.html`

3.4 Athey and Imbens on Machine Learning

http://nber.org/econometrics_minicourse_2015

- Guido Imbens: Introduction to Supervised ML Concepts and Algorithms
- Guido Imbens: Prediction, Classification, and Applications
- Susan Athey: Machine Learning and Causal Inference
- Susan Athey: Unsupervised Learning: Applications to Networks and Text Mining

3.5 Imbens and Wooldrige: Whats New in Econometrics?

http://nber.org/minicourse3.html

- Estimation of Average Treatment Effects Under Unconfoundedness
- Linear Panel Data Models
- Regression Discontinuity Designs
- Nonlinear Panel Data Models
- Instrumental Variables with Treatment Effect Heterogeneity: Local Average Treatment Effects
- Control Function and Related Methods
- Bayesian Inference
- Cluster and Stratified Sampling
- Partial Identification
- Difference-in-Differences Estimation
- Discrete Choice Models
- Missing Data
- Weak Instruments and Many Instruments
- Quantile Methods
- Generalized Method of Moments and Empirical Likelihood

3.6 Drawing Causal Inference from Big Data (Sackler YouTube Channel)

http://www.nasonline.org/programs/sackler-colloquia/completed_colloquia/Big-data.html
https://www.youtube.com/playlist?list=PLGJm1x3XQeK0NgFOX2Z7Wt-P5RU5Zv0Hv

1. On Computational Thinking, Inferential Thinking and Big Data (Jordan)
2. From Multiple Experiments and Observations to Valid Causal Conclusions (Pearl)
3. Non-parametric Causal Inference (Richardson)
4. Causal Inference in the Presence of Hidden Confounders in Genomics (Heckerman)
5. Combining Experiments with Big Data to Estimate Treatment Effects (Sekhon)
6. Lasso Adjustments of Treatment Effect Estimates in Randomized Experiments (Yu)
7. Toward Causal Machine Learning (Schölkopf)
8. Decoding the Human Genome: From Sequence to Knowledge (Stamatoyannopoulos)
9. Optimal Design of Causal Experiments in the Presence of Social Interference (Airoldi)
10. Causal Inference Based on Invariance: Exploiting the Power of Heterogeneous Data (Buhlmann)
11. Thinking Differently About Big Data (Levitt)
12. Project MindScope: From Big Data to Behavior in the Functioning Cortex(Hawrylycz)
13. Honest Inference From Observational Database Studies (Madigan)
14. Estimating Heterogeneous Treatment Effects Using Machine Learning in Observational Studies (Athey)
15. Causal Reasoning and Learning Systems (Bottou)
16. Identifying Peer Effects in Social Networks (Eckles)
17. Causal Inference, Econometrics, and Big Data (Varian)
18. Personalized Medicine, Optimal Treatment Strategies, and First Do No Harm: Time Varying Treatments and Big Data (Robins)
19. An 85 Million Person Follow-up to a 61 Million Person Experiment in Social Influence and Political Mobilization (Fowler)

3.7 Cosma Shalizi

http://bactra.org/notebooks/causal-inference.html
http://bactra.org/notebooks/causality.html
http://bactra.org/notebooks/graphical-causal-models.html

3.8 Others

1. Jasjeet Singh Sekhon's course on *Statistics of Causal Inference in the Social Sciences*
   Syllabus: http://sekhon.berkeley.edu/causalinf/causalinf.pdf

2. *If correlation doesn't imply causation, then what does?* by Michael Nielsen
   http://www.michaelnielsen.org/ddi/if-correlation-doesnt-imply-causation-then-what-does

3. Journal of Causal Inference
   http://www.degruyter.com/view/j/jci

4. Friends don't/do let friends do IV
   don't: http://mungowitzend.blogspot.co.uk/2015/09/friends-dont-let-friends-do-iv.html?m=1
   do: http://marcfbellemare.com/wordpress/11364

5. Chris Auld's Remarks on Chen and Pearl (2013) Regression and Causation: A Critical Examination of Six Econometrics Textbooks. Real-World Economics Review, 65, 2-20.
   http://chrisauld.com/2013/10/08/remarks-on-chen-and-pearl-on-causality-in-econometrics-textbooks/