Ben B. Hansen

curriculum vitae

Statistics Department
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Current Position

Associate Professor, Statistics Department, University of Michigan. Fall 2010-present.

Faculty Associate, Survey Research Center–Quantitative Methods Group and **Research Affliate**, Population Studies Center, Institute for Social Research, University of Michigan. Fall 2003-present.

Previous Positions

Assistant Professor, Statistics Department, University of Michigan. Fall 2003–Spring 2010.

NSF Postdoctoral Fellow, Statistics Departments of the University of Pennsylvania (Fall 2001–Spring 2002) and the University of Michigan (Fall 2002–Spring 2003).

Mathematics Teacher, University High School, San Francisco. Fall 1993–Spring 1994.

Education

Ph.D., University of California, Berkeley. Logic and Methodology of Science. December 2001.

M.A., University of California, Berkeley. Statistics. December 2000.

A.B., Harvard College, *magna cum laude*. Mathematics and Philosophy. April 1993.

Publications

Papers in Peer-Reviewed Journals

M. Cerda, J. D. Morenoff, B. B. Hansen, K. J. Tessari Hicks, L. F. Duque, A. Restrepo, A. V. Diez Roux (2012). Reducing violence by transforming neighborhoods: A natural experiment in Medellín. *American Journal of Epidemiology*. (doi:10.1093/aje/kwr428)

Kirkland, A. R., Hansen, B. B. (2011). 'How do I Bring Diversity?' Race and Class in the College Admissions Essay. *Law and Society Review* **45** (1) 103–138.

C. A. Hosman, B. B. Hansen, P. W. Holland (2010). The Sensitivity of Linear Regression Coefficients' Confidence Limits to the Omission of a Confounder. *Annals of Applied Statistics* **4** (2) 849–70. (doi:10.1214/09-AOAS315)

B. B. Hansen, J. W. Bowers (2009). Attributing Effects to A Cluster Randomized Get-Out-The-Vote Campaign. *Journal of the American Statistical Association* **104** (487) 873–85. (doi:10.1198/jasa.2009.ap06589 .)

B. B. Hansen (2008). The Prognostic Analogue of the Propensity Score. *Biometrika* **95** (2) 481–88.

B. B. Hansen, J. W. Bowers (2008). Covariate Balance in Simple, Stratified and Clustered Comparative Studies. *Statistical Science* **23** (2) 219–36.

J. D. Morenoff, J. S. House, B. B. Hansen, D. R. Williams, G. A. Kaplan, H. E. Hunte (2007). Understanding Social Disparities in Hypertension Prevalence, Awareness, Treatment, and Control: The Role of Neighborhood Context. *Social Science and Medicine* **69** (9) 1853–1866.

B. B. Hansen (2007). Optmatch: Flexible, Optimal Matching for Observational Studies. *R News*, **7** (2), 18–24.

A. Gnedin, B. Hansen, J. Pitman (2007). Notes on the Occupancy Problem with Infinitely Many Boxes: General Asymptotics and Power Laws. *Probability Surveys*, **4**, 146–171.

B. B. Hansen and S. Olsen Klopfer (2006). Optimal Full Matching and Related Designs via Network Flows. *Journal of Computational and Graphical Statistics*, **15** (3), 609–627.

S. E. Evans, B. B. Hansen, and P. B. Stark (2005). Minimax Expected Measure Confidence Sets for Restricted Location Parameters. *Bernoulli*, **11**, (4) 571–590.

B. B. Hansen (2004). Full Matching in an Observational Study of Coaching for the SAT. *Journal of the American Statistical Association*, **99** (467) 609–619.

B. Hansen and J. Pitman (2000). Prediction Rules for Exchangeable Sequences Related to Species Sampling. *Statistics and Probability Letters* **46** 251–256.

Commentary in Peer-Reviewed Journals

B. B. Hansen (2008). The Essential Role of Balance Tests in Propensity-Matched Observational Studies: Comments on "A Critical Appraisal of Propensity-Score Matching in the Medical Literature Between 1996 and 2003" by Peter Austin. *Statistics in Medicine* **27** (12) 2050–2054.

Papers in Peer-Reviewed Collections

B. B. Hansen (2011). Propensity score matching to extract latent experiments from nonexperimental data: A case study. Ch. 9 of N. Dorans and S. Sinharay, eds., *Looking Backwards: Proceedings from a Conference in Honor of Paul W. Holland*, Springer.

J. D. Morenoff, A. Diez Roux, B. B. Hansen, and T. Osypuk (2008). Residential Environments and Obesity: What Can We Learn about Policy Interventions from Observational Studies? In R. Schoeni, J. House, G. Kaplan, H. Pollack (eds.), *Making Americans Healthier: Social and Economic Policy as Health Policy*, Russell Sage Foundation.

Unpublished Technical Reports

B. B. Hansen (2009). Propensity score matching to recover latent experiments: diagnostics and asymptotics. Report 486, University of Michigan Statistics Department.

Papers in Edited Volumes

B. Hansen. Cognitive and Philosophical Conditions for Probability: the Case of Cardano. In *Proceedings of the 1998 Stanford-Berkeley Graduate Student Philosophy Conference*, eds. D. Johnson *et. al.*, Berkeley: Department of Philosophy, 64–73, 1998.

B. Hansen. Finitizability Questions for some Reducts of Cylindric Algebras. In *Logic Colloquium '92*, eds. L. Csirmaz *et. al.*, Stanford: CSLI Publications, 115–134, 1995.

Grants and Contracts

Gates Foundation: "Statistical back-end for the Gates Evaluation Engine;" PI. $241,000; 2012-13.

NSF: "Collaborative Research: Propensity Scores and Randomization-Based Inference, or Modeling Assignment to Treatment Conditions as Manifestly or Latently Random"; PI[1]. $196,000; 2008–2011.

NSA: "Confidence Intervals for the Attributable Effect in Experiments and Observational Studies: Developing Theory to Support Effective Algorithms"; PI. $30,000; 2008–2009.

Advance Project, University of Michigan: "The Statistics MA+ Initiative: A New Bridge to Ph.D. Studies in Statistics and Related Disciplines"; PI. $11,300; 2007–2009.

Whitaker Fund, University of Michigan: "Promoting Discovery-Based, Conceptual Learning in Lower Division Statistics Courses"; PI. $10,000; 2006–2007.

NICHD: "Human Subject Protection & Disclosure Risk Analysis"; co-investigator. $ 54,400; 2004–2008.

Professional Activities

Associate editor, *Journal of the American Statistical Association* (Theory & Methods), 2009–present.

Consultant, Sage Quantitative Applications in the Social Sciences monograph series, 2009–present.

Conference co-chair (with M. Elliott), 2011 Atlantic Causal Inference Conference, University of Michigan, Ann Arbor; May 2011.

Scientific Organizing Committee member, Ninth International Conference on Health Policy Statistics, Cleveland, Ohio; October 2011.

Instructor of full- and half-day workshops on propensity score matching in R. Center for Statistical Consulation and Research, University of Michigan, yearly from 2004 through present; Center for the Analysis of Pathways from Childhood to Adulthood, University of Michigan, 2010; ENAR Spring Meeting, Miami, 2011.

Instructor, "Causal Inference," an intensive one-month course at the Inter-university Consortium for Political and Social Research's (ICPSR's) Summer Program in Quantitative Methods of Social Research; Ann Arbor, 2011.

Developer of a free add-on package to R, "optmatch," implementing methods from Hansen (2004, *JASA*) and Hansen & Klopfer (2006, *JCGS*).

Co-developer (with Jake Bowers and Mark Fredrickson) of a free add-on R package and Stata routine, "RItools" (Randomization Inference Tools), implementing methods from Hansen & Bowers (2008 *Statist. Sci.*).

Distinguished Visiting Statistician, Washington University in St. Louis, Spring 2009.

Member of American Statistical Association, Institute for Mathematical Statistics, Bernoulli Society, Royal Statistical Society.

[1]Linked to a parallel and separate grant to the University of Illinois-Urbana-Champaign, with Jake Bowers as PI.

Presentations

The hidden role of the propensity score in observational studies for causal effects. Invited presentations to the Statistics Department, University of Pennsylvania (February 2011); to the Statistics Department, George Mason University (April 2011); to the 34th Midwestern Biopharmaceutical Statistics Workshop, Ball State University (May 2011); to the Center for Statistical Sciences, Brown University (October 2011); to the Q-Center, Northwestern University (February 2012); and to the Econometrics and Statistics Department, Booth School of Business, University of Chicago (May 2012).

Randomization inference with the Peters-Belson method. Invited presentation to the Atlantic Causal Modeling Conference, New York (May 2010).

Attributing effects to a cluster randomized get-out-the-vote campaign. Invited presentations to the Center for Applied Statistics, Washington University in St. Louis (January 2009); to the Statistics Department, University of Pennsylvania (April 2009); and to the Statistics Department, Carnegie Mellon University (April 2010).

Propensity score matching to recover latent experiments: diagnostics and asymptotics. Invited presentations to the Atlantic Causal Modeling Conference, Philadelphia (May 2009); to the Center for Statistics and the Social Sciences, University of Washington, Seattle (October 2009); to the Statistics Group at Rand Corporation, Pittsburgh (December 2009); to the Columbia University Psych/Neuro Epidemiology Cluster (May 2011); at the annual meeting of the Western North American Region of the Biometric Society, San Luis Obispo (June 2011); and at the annual meeting of the Association for Clinical and Translational Statisticians, Miami (July 2011). Topic-contributed presentation at Joint Statistical Meetings, Vancouver (2010).

Tests of covariate balance in experiments and observational studies. Joint Statistical Meetings, Washington, D.C. (August 2009).

Tests of covariate balance in propensity-matched observational studies. Twenty-sixth annual summer meeting of the Society for Political Methodology, Yale University (July 2009).

New methods of causal inference: Matching, Adjustment and Propensity Scores. Two invited presentations in the Blalock Lectures series of the ICPSR Graduate Summer School, Ann Arbor (July 2008; July 2009).

Matching with propensity and prognostic scores. Invited contribution to the Symposium on Matching in Cohort Studies, Annual Meeting of the Society for Epidemiologic Research, Anaheim (June 2009).

Full matching in an observational study of coaching for the SAT (with a sensitivity analysis). Invited presentation to the Conference in Honor of Paul W. Holland, Princeton, New Jersey (September 2008).

Matching with propensity and prognostic scores. Invited presentation, Joint Statistical Meetings, Salt Lake City (July 2007).

Comment on a paper by Glynn and Quinn. Twenty-fourth annual summer meeting of the Society for Political Methodology, Penn State (July 2007).

Flexible, optimal matching for comparative studies: A network flows algorithm and an R package. Invited presentation in the JCGS Highlights session of the 39th Symposium on the Interface: Computing Science and Statistics, Philadelphia (May 2007); plenary presentation at UseR2007, Aimes, Iowa (August 2007).

The method of attributable effects: permutation inference for treatment effects under heterogeneity. Invited presentations at the Center for European Economic Research (ZEW), Mannheim, Germany, and at the Swiss Institute for International Economics and Applied Economic Research, St. Gallen, Switzerland(December 2006).

A local, first-order characterization of omitted variable bias for propensity-stratified data. Invited contribution to the Workshop on Large Graphical Models and Random Matrices, SAMSI, Research Triangle Park, North Carolina (November 2006).

Covariate balance in simple, stratified and clustered comparative studies. Presentation to the Applied Statistics Workshop, Harvard University (October 2006).

Analysis of quasi-experiments using full matching with propensity and prognosis scores. Presentation to the Sixth Winemiller Conference, University of Missouri, Columbia, (October 2006).

The OPTMATCH *package: flexible, optimal matching for observational studies*. Presentation to the UseR! 2006 conference, Wirtschaftsuniversität Wien, Austria (June 2006).

Matching with prognosis scores: A new method of adjustment for comparative studies. Invited presentations to the Department of Statistics at Columbia University (April 2006), to the Applied Statistics Workshop at Harvard University (May 2006), and to Simon Fraser University (September 2006).

Attributing effects in cluster randomized trials and observational studies: the case of a get-out-the-vote campaign. Invited presentations to Yale University's Department of Biostatistics (October 2005) and to Case Western Reserve University's Center for Health Care Research and Policy (September 2005).

SAT Scores for Sale? Pseudoexperimental Assessment of Commercial Test Preparation via Optimal Full Matching. Invited presentations to the Cleveland Chapter of the ASA (September 2005); to the Eighth Conference for African-American Researchers in the Mathematical Sciences, Princeton University, (June 2002); to a seminar of the Biostatistics Department, Bloomberg School of Public Health, Johns Hopkins University (May 2002); and to a seminar of the Survey Research Center, Institute for Social Research, University of Michigan (February 2002).

Full matching with propensity scores. Joint Statistical Meetings, Minneapolis (August 2005).

Attributing effects to a get-out-the-vote campaign using full matching. Political Methodology Summer Conference, Florida State University (July 2005).

Randomization inference for the attributable effect via full matching. Invited presentation at the 55th Session of the International Statistical Institute, Sydney, Australia (April 2005).

Flexible, optimal matching for the comparison of two groups. International Conference of the Royal Statistical Society, Manchester, UK (September 2004).

Flexible matching in sample surveys containing observational studies. Presented in the Contributed Papers section on Surveys, annual meeting of the Biometric Society, Eastern North American Region, Pittsburg, March 29, 2004; and in the Survey Methodology section of the American Sociological Association Methodology Conference, Ann Arbor, April 23, 2004.

Minimax Expected Length Binomial Confidence Intervals. Presented in a Contributed section on Statistical Decision Theory at the Seventh Purdue International Symposium on Statistics, West Lafayette, June 22, 2003.

Evaluating SAT Test Preparation: Gains, Effects and Self-Selection (with Derek Briggs). Presented at the University of California conference on "Rethinking the SAT in University Admissions," Santa Barbara, November 17, 2001.

Teaching Experience

Instructor of `Causal Inference`, a Ph.D.-level course for social scientists on contemporary methods of causal inference with randomized and nonrandomized designs. ICPSR Summer Program in Quantitative Methods of Social Research, Ann Arbor, Summer 2011.

Designer and Co-Instructor (with Robert Walker and Dominik Hengartner) of *Applied Statistics 560: Statistical Research Seminar*, a graduate seminar on methods of adjustment for randomized experiments and observational studies in the social sciences. Center for Applied Statistics, Washington University, St. Louis. Spring 2009.

Instructor, *Statistics 150: Making Sense of Data.* Statistics Department, University of Michigan, Ann Arbor. 2008–present.

Co-Instructor (with Edward Rothman and Chuck Kowalski) of *Comparative Studies: Matching, Adjustment, and Propensity Scores,* a workshop for researchers, Michigan's Center for Statistical Consulting and Research (CSCAR), November 2004, November 2005, April 2007 and May 2008. Co-Instructor with E. Rothman, April 2010 and April 2011.

Instructor, *Statistics 400: Applied Statistical Methods.* Statistics Department, University of Michigan, Ann Arbor. Various terms, 2002–present.

Instructor, *Statistics 480: Survey Sampling Techniques.* Statistics Department, University of Michigan, Ann Arbor. Various terms, 2003–present.

Instructor, *Statistics 617: Causal Inference in the Social Sciences.* Statistics Department, University of Michigan, Ann Arbor. Winter 2004.

Instructor, *Statistics 700: Design-Based Inference for Observational Studies.* Statistics Department, University of Michigan, Ann Arbor. Fall 2005.

Instructor, *Introductory Probability and Statistics for Business.* Statistics Department, University of California, Berkeley. Summer 1999.

Teaching Assistant, *Introductory Probability and Statistics for Social and Life Scientists, Introductory Probability and Statistics for Business, Introductory Probability Theory,* and *Introductory Statistical Theory.* Statistics Department, University of California, Berkeley. Fall 1995–spring 2000.

Mathematics Teacher, University High School, San Francisco. Fall 1993–spring 1994.

Teaching Assistant, Summer Math Institute, U. C., Berkeley. Summer 1992.

Teaching Assistant, Professional Development Program, U. C., Berkeley. Summer 1989.

Consulting

Consultant, William and Melinda Gates Foundation, College Ready Education (US Programs), 2012.

Co-consultant (with R. Correnti and B. Rowan) to the Charles A. Dana Center of the University of Texas, Austin, for a preliminary evaluation of the Agile Mind program and services, 2008.

Consultant to Youth, Education & Society group, University of Michigan's Survey Research Center, Summer 2006–Summer 2007.

Consultant for the University of Michigan's NSF-ADVANCE study. Provided matching-based comparison of office space for male and female faculty members. Spring–Fall 2003.

Intern Statistician, Emerging Illness Group, Naval Health Research Center, San Diego. Devised record linking methods for birth defect studies. Prepared statistical evidence for Gulf War-related illness in U.S. Armed Forces veterans. Summer 1998.

Awards and Fellowships

American Political Science Assocation's 2010 Franklin L. Burdette/Pi Sigma Alpha Award (for best paper presented at the 2009 annual meeting of the APSA), recognizing a paper jointly authored with J. Bowers.

The article "Optimal full matching and related designs via network flows" (with S.O. Klopfer) was one of three chosen for the Highlights of the 2006 *Journal of Computational and Graphical Statistics*.

National Science Foundation Mathematical Sciences Postdoctoral Fellow. 2001–2005.

Ford Foundation Minority Dissertation Fellow. 2000-2001.

National Defense Science and Engineering Graduate Fellowship. 1995–1998.

Fulbright Fellowship (to study philosophy), University of Oslo, Norway. 1993.

Outstanding undergraduate thesis award ("Hoopes Prize"), Harvard College. 1993.

Mellon Minority Undergraduate Fellowship. 1990-1993.