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## EDUCATION

Ph.D., Statistics, Carnegie Mellon University, 2001

M.S., Statistics, Carnegie Mellon University, 1997

B.A., Environmental Science and Policy, Duke University, 1996

## PROFESSIONAL EXPERIENCE

2005 – present, Statistician, RAND Statistics Group, Pittsburgh, PA

2001 – 2005, Associate Statistician, RAND Statistics Group, Pittsburgh, PA

1996 – 2001, Graduate student, Dept. of Statistics, Carnegie Mellon University, Pittsburgh, PA

1999 – 2000, NSF VIGRE Teaching Fellow, Dept. of Statistics, Carnegie Mellon University, Pittsburgh, PA

1998 – 1999, Research assistant, Dr. Kathryn Roeder, Dept. of Statistics, Carnegie Mellon University, Pittsburgh, PA

1995 – 1996, Research assistant, Dr. William F. Morris, Dept. of Zoology, Duke University, Durham, NC

## HONORS AND AWARDS

RAND Bronze Merit Bonus Award, 2005

Leonard J. Savage Award for outstanding doctoral dissertation in Bayesian Application Methodology, 2001

American Statistical Association Pittsburgh Chapter Student of the Year, 2001

NSF Vertical Integration of Research Teaching Fellowship, 1999 – 2000

NSF Graduate Research Fellowship, 1996 – 1999

Phi Beta Kappa and Golden Key National Honor Societies, 1996

Dean's List with Distinction and graduation *summa cum laude*, Duke University, 1996

## JOURNAL ARTICLES AND WORKING PAPERS

**Lockwood JR** and McCaffrey DF (2008). “Exploring student-teacher interactions in longitudinal achievement data,” accepted, *Education Finance and Policy*.

McCaffrey DF, Sass TR and **Lockwood JR** (2008). “The intertemporal stability of teacher effect estimates,” currently under review by *Education Finance and Policy*.

Mariano LT, McCaffrey DF, and **Lockwood JR** (2008). “A model for teacher effects from longitudinal data without assuming vertical scaling,” currently under review by *Journal of Educational and Behavioral Statistics*.

**Lockwood JR** and McCaffrey DF (2008). "On the use of value-added assessment to evaluate teacher preparation programs," in preparation.

Le V, **Lockwood JR**, Stecher B, Hamilton L, and Martinez, F. (2008). "A longitudinal investigation of the relationship between reform-oriented instruction and student achievement," *Educational Evaluation and Policy Analysis*, in press.

McCaffrey DF, Han B, and **Lockwood JR** (2008). "From data to bonuses: A case study of the issues related to awarding teachers pay on the basis of their students' progress." Working Paper #2008-14. Nashville, TN: National Center on Performance Initiatives.

**Lockwood JR** and McCaffrey DF (2007). "Controlling for individual heterogeneity in longitudinal models, with applications to student achievement," *Electronic Journal of Statistics*, 1: 223-252. <http://dx.doi.org/10.1214/07-EJS057>.

**Lockwood JR**, McCaffrey DF, Mariano LT and Setodji C (2007). "Bayesian methods for scalable multivariate value-added assessment," *Journal of Educational and Behavioral Statistics*, 32(2): 125-150.

**Lockwood JR**, McCaffrey DF, Hamilton LS, Stecher BM, Le V and Martinez F (2007). "The sensitivity of value-added teacher effect estimates to different mathematics achievement measures," *Journal of Educational Measurement* 44(1): 47-67

Elliott MN, McCaffrey DF and **Lockwood JR** (2007). "How important is exact balance in treatment and control sample sizes in evaluations?" *Journal of Substance Abuse Treatment*, 33(1): 107-110.

Stecher B, Le V, Hamilton L, Ryan G, Robyn A, and **Lockwood JR** (2006). "Using structured classroom vignettes to measure instructional practices in mathematics," *Educational Evaluation and Policy Analysis*, 28(2): 101-130.

Doran HC and **Lockwood JR** (2005). "Fitting value-added models in R," *Journal of Educational and Behavioral Statistics*, 31(2): 205-230.

**Lockwood JR** and Schervish MJ (2005). "MCMC strategies for computing Bayesian predictive densities for censored multivariate data," *Journal of Computational and Graphical Statistics*, 14(2): 395-414.

**Lockwood JR**, Schervish MJ, Gurian PL and Small MJ (2004). "Analysis of contaminant co-occurrence in community water systems," *Journal of the American Statistical Association*, 99(465):36-44.

Gurian PL, Small MJ, **Lockwood JR** and Schervish MJ (2004). "Assessing nationwide cost-benefit implications of multi-contaminant drinking water standards," *Journal of the American WaterWorks Association*, 96(3):70-83.

McCaffrey DF, **Lockwood JR**, Koretz D, Louis TA and Hamilton L (2004). "Models for value-added modeling of teacher effects (with discussion)," *Journal of Educational and Behavioral Statistics*, 29(1):67-102.

McCaffrey DF, **Lockwood JR**, Koretz D, Louis TA and Hamilton LS (2004). "Let's see more empirical studies of value-added models of teacher effects: A reply to Raudenbush, Rubin, Stuart and Zanuto," *Journal of Educational and Behavioral Statistics*, 29(1):139-144.

**Lockwood JR**, Doran H, and McCaffrey DF (2003). "Using R for estimating longitudinal student achievement models," *The R Newsletter*, 3(3):17-23.

Shkolnik J, Hikawa H, Suttorp M, **Lockwood JR**, Stecher B and Bohrnstedt G (2002). "The relationship between teacher characteristics and student achievement in reduced-size classes: A study of 6 California districts." Technical Appendix D of *What We Have Learned About Class Size Reduction in California*, Bohrnstedt and Stecher, editors. CSR Research Consortium: CA.

Kirby SN, McCaffrey DF, **Lockwood JR**, Sloan McCombs J, Naftel S and Barney H (2002). "Using state school accountability data to evaluate federal programs: A long uphill road." *The Peabody Journal of Education*, 99(4):122-145.

**Lockwood JR** and Louis TA (2002). Discussion of "Multi-course treatment strategies for rapidly fatal diseases." *Case Studies in Bayesian Statistics, Volume VI*, Lecture Notes in Statistics, Volume 167, Gatsonis, *et al.*, editors. New York: Springer-Verlag.

**Lockwood JR**, Louis TA and McCaffrey D (2002). "Uncertainty in rank estimation: Implications for value added modeling accountability systems." *Journal of Educational and Behavioral Statistics*, 27 3: 255-270.

**Lockwood JR**, Schervish MJ, Gurian PL and Small MJ (2001). "Characterization of arsenic occurrence in source waters of U.S. community water systems." *Journal of the American Statistical Association*, 96 456:1184-1193.

Gurian PL, Small MJ, **Lockwood JR** and Schervish MJ (2001). "Addressing uncertainty and conflicting cost estimates in revising the arsenic MCL." *Environmental Science and Technology*, 35 22:4414-4420.

Gurian PL, Small MJ, **Lockwood JR** and Schervish MJ (2001). "Benefit-cost estimation for alternative drinking water MCLs." *Water Resources Research*, 37 8:2213-2226.

**Lockwood JR**, Roeder K and Devlin B (2001). "A Bayesian hierarchical model for allele frequencies." *Genetic Epidemiology*, 20 1:17-33.

Underwood N, Morris WF, Gross KR and **Lockwood JR** (2000). "Induced resistance to Mexican bean beetles in soybean: Variation among genotypes and lack of correlation with constitutive resistance." *Oecologia*, 122 1:83-89.

Gross KR, **Lockwood JR**, Morris WF and Frost CC (1998). "Modeling controlled burning and trampling reduction for conservation of *Hudsonia montana*." *Conservation Biology*, 12:1291-1301.

**Lockwood JR** (1998). "On the statistical analysis of multiple-choice feeding preference experiments." *Oecologia*, 116 4:475-481.

## RAND PUBLICATIONS

Marsh JA, Sloan McCombs J, **Lockwood JR**, Martorell F, Gershwin D, Naftel S, Le V, Shea M, Barney H and Crego A. (2008). *Supporting Literacy Across the Sunshine State: A Study of Florida Middle School Reading Coaches*. RAND MG-762-CC.

**Lockwood JR** and McCaffrey DF (2007). "Controlling for student heterogeneity in longitudinal achievement models," RAND WR-471-IES.

Le V, Stecher B, **Lockwood JR**, Hamilton LS, Robyn A, Williams V, Ryan G, Kerr K, Martinez F and Klein S (2006). *Improving Mathematics and Science Education: A Longitudinal Investigation of the Relationship between Reform-Oriented Instruction and Student Achievement*. RAND MG-480-EDU.

Gill BP, Hamilton LS, **Lockwood JR**, Marsh JA, Zimmer RW, Hill D and Pribesh S (2005). *Inspiration, Perspiration, and Time: Operations and Achievement in Edison Schools*. RAND MG-351-EDU.

**Lockwood JR**, Le V, Stecher B, Hamilton L (2005). "A value-added modeling approach for examining the relationship between reform teaching and mathematics achievement," RAND WR-262-EDU.

Le V, **Lockwood JR**, Stecher B, Hamilton L, Williams V, Robyn A, Ryan G, and Alonzo A (2003). "Is reform-oriented teaching related to mathematics and science achievement?" RAND WR-166-EDU.

McCaffrey DF, **Lockwood JR**, Koretz D and Hamilton L (2003). *Evaluating Value-Added Models for Teacher Accountability*. RAND MG-158-EDU.

MacDonald J and **Lockwood JR** (2003). *Alternatives for Landmine Detection*. RAND MR-1608.

Hickman LJ, Fain T, Turner S, Ridgeway G, Raymond B and **Lockwood JR** (2003). *Evaluation of the Impact of Seattle's DWLS Impound Law*. RAND WR-117-SEA.

MacDonald J, Knopman D, **Lockwood JR**, Cecchine G and Willis HH (2002). *Risk of Unexploded Ordinance: Critical Review of Assessment Methods for Closed, Transferred, and Transferring Ranges*. RAND MR-1674A.

## BOOK CHAPTERS

**Lockwood JR** (2006). "A case study of some practical challenges of longitudinal student achievement modeling: The RAND Mosaic II study," in *Longitudinal and Value Added Modeling of Student Performance* (R. Lissitz, editor), Maple Grove, MN: JAM Press.

McCaffrey DF, **Lockwood JR**, Mariano L and Setodji C (2005). "Challenges for value-added assessment of teacher effects," in *Value Added Models in Education: Theory and Practice* (R. Lissitz, editor), Maple Grove, MN: JAM Press.

## MISCELLANEOUS PUBLICATIONS

McCaffrey, DF and **Lockwood JR** (2008). "Uses of value-added measures of teacher effects in education." Prepared for the National Research Council and the National Academy of Education.

Zimmer R, Gill B, Razquin P, Booker K and **Lockwood JR** (2007). "National Longitudinal Study of No Child Left Behind: Title I Parental School Choice, Supplemental Educational Services, and Student Achievement." Prepared for the U.S. Department of Education, 2007.

Gill B, **Lockwood JR**, Martorell F, Setodji C and Booker K (2007). "NCLB accountability and student achievement," currently under review by U.S. Department of Education.

Bos J, McCaffrey DF, Doran H and **Lockwood JR** (2006). "Design and feasibility of an evaluation of the value added method of measuring teacher performance," currently under review by U.S. Department of Education.

Guarino CM, Hamilton LS, **Lockwood JR**, Rathbun AH and Germino Hausken E (2006). "Teacher qualifications, instructional practices and reading and mathematics gains of kindergartners," Research and Development Report, U.S. Department of Education National Center for Education Statistics, Washington, DC.

**Lockwood JR** (2004). Review of *Risk Analysis in Engineering and Economics* by B.M. Ayyub, *Journal of the American Statistical Association*, 99 466: 563.

Gurian PL, Small MJ, **Lockwood JR**, and Schervish MJ (2004). "Modeling treatment decisions, costs, and risk implications of regulations for the US water supply industry," Proceedings of the Engineering Systems Symposium, Massachusetts Institute of Technology, Cambridge, MA.

Adak P, Gurian P and **Lockwood JR** (2003). "Modeling arsenic exposure and health risks in U.S. drinking water supplies," Proceedings of Texas Water 2003.

MacDonald J, **Lockwood JR** and McFee J (2003). "Research plan for a multisensor landmine detector," Proceedings of EUDEM-SCOT 2003.

**Lockwood JR** (2001). *Estimating Joint Distributions of Contaminants in U.S. Community Water System Sources*. Ph.D. dissertation, Department of Statistics, Carnegie Mellon University.

Gurian PL, Small MJ, **Lockwood JR** and Schervish MJ (2000). "Simulating variability and uncertainty for a regulatory impact assessment of arsenic in drinking water," Proceedings of the 32nd Annual Mid- Atlantic Industrial and Hazardous Waste Conference.

## INVITED PRESENTATIONS

"A synthetic control approach to monitoring student achievement in Pittsburgh Public Schools," presented to Pittsburgh Public Schools, November 2008.

"The intertemporal stability of teacher effect estimates" (non-presenter; coauthors with D. McCaffrey and T. Sass), National Conference on Value-Added Modeling, University of Wisconsin at Madison, April 2008.

“Are teachers differentially effective with students of differing abilities?” (with D. McCaffrey), National Conference on Value-Added Modeling, University of Wisconsin at Madison, April 2008.

“From data to bonuses: A case study of awarding teachers pay on the basis of their students’ progress (non-presenter; coauthors with D. McCaffrey and B. Han), National Center for Performance Incentives National Conference, Nashville, TN, February 2008.

“Bridging the gap between econometric and statistical models for longitudinal student achievement data” (with D. McCaffrey), University of Pennsylvania Graduate School of Education, October 2007.

“Conceptual distinctions among the different uses of student growth data,” presented to Pennsylvania Association of School Administrators, October 2007.

“Regression discontinuity analyses of the effects of NCLB accountability provisions on student achievement” (with B. Gill, C. Setodji and F. Martorell), Joint Statistical Meetings, Salt Lake City, UT, July 2007

“New results on mixed model approaches to longitudinal and value-added modeling of student achievement” (with D. McCaffrey), Institute of Education Sciences Research Conference, Washington, DC, June 2007.

“Linking teacher-level human and social capital measures to student achievement” (non-presenter; co-author with B Gill and MK Stein), Human and Social Capital in Learning Systems, Pittsburgh, PA, February 2007.

“Making sense of value-added model specifications: Results from empirical investigations in Florida,” University of Wisconsin Workshop on Value-Added Models, Madison, WI, November 2006.

“Value-added indicators of performance: What we know and suggestions for further study,” National Academy of Sciences Board on Testing and Assessment meeting, Woods Hole, MA, July 2006.

“Exploring robustness of estimated teacher effects to teacher-by-student interactions and missing data,” (with D. McCaffrey), Institute of Education Sciences Research Conference, Washington, DC, June 2006.

“The (sometimes harsh) reality of longitudinal student achievement modeling,” University of Maryland Conference on Longitudinal Modeling of Student Achievement, College Park, MD, November 2005.

“Bayesian value-added assessment and the exploration of the persistence of teacher effects,” (with L. Mariano), Case Studies in Bayesian Statistics, Workshop 8, Pittsburgh, PA, September 2005.

“Bayesian approaches to value added modeling of teacher and school effects,” (with D. McCaffrey, L. Mariano and C. Setodji), American Education Research Association Annual Meeting, Montreal, CA, April 2005.

“Challenges for value-added assessment of teacher effects,” (non-presenter; co-author with D. McCaffrey, L. Mariano and C. Setodji), University of Maryland Conference on Value Added Assessment, College Park, MD, November 2004.

“Hierarchical models for sharing information among environmental systems,” (non-presenter; coauthor with M. Small, M. Schervish *et al.*), California Institute of Technology Environmental Science and Engineering Seminar, February 2004.

“Models for value-added modeling of teacher effects,” (non-presenter; coauthor with D. McCaffrey, D. Koretz, T. Louis and L. Hamilton), Measurement of Instruction: Technical Challenges and Implications for Research, Policy, and Practice, Washington, DC, January 2004.

“Bayesian opportunities in drinking water quality regulation,” (with P. Gurian, M. Schervish and M. Small), International Workshop on Bayesian Data Analysis, Santa Cruz, CA, August 2003.

“An introduction to value-added methods for teacher accountability,” presented to Cleveland Chapter of the American Statistical Association, June 2003.

“Regional impacts of a lower arsenic drinking water standard,” (non-presenter; coauthor with P. Gurian, M. Small and M. Schervish), presented at Water Summit, University of Texas at El Paso, El Paso, TX, August 2002.

Discussion of “Multi-course treatment strategies for rapidly fatal diseases” (with T. Louis) by P.F. Thall, H. Sung and E.H. Estey, Case Studies in Bayesian Statistics, Workshop 6, Pittsburgh, PA, September 2001.

“Integrated assessment of drinking water regulations,” (non-presenter; coauthor with M. Small, P. Gurian and M. Schervish), 33rd Symposium on the Interface of Computing Science and Statistics, June 2001.

“Use of disparate data in exposure assessment,” (non-presenter; coauthor with M. Small, P. Gurian and M. Schervish), SRA, EPRI, RFF, EPA Workshop on Advanced Methods for Dose-Response Assessment: Bayesian Methods, September 2000.

“Characterization of joint occurrence of multiple contaminants in US public drinking water sources,” Ohio State University Department of Statistics seminar, January 2000.

“Uncertainty and sensitivity analysis of drinking water regulatory compliance costs,” (non-presenter; coauthor with P. Gurian, M. Small and M. Schervish), presentation at EPA Drinking Water Regulatory Impact Analysis Model meeting, September 1998.

## GRANTS AND CONTRACTS

Enhanced Value-Added Models for Estimating Teacher Effects. Department of Education, Institute of Education Sciences, \$500,000, 10/2004 – 9/2007.

(pending) Reducing Bias and Improving Efficiency of Estimated Teacher Effects from Value-Added Models. Department of Education, Institute of Education Sciences, \$1,000,000.

## TEACHING EXPERIENCE

- 2000 – “Experimental Design,” Dept. of Statistics, Carnegie Mellon University, Pittsburgh, PA  
2005 – “R: An open-source environment for statistical analysis,” RAND Statistics Group Short Course, Pittsburgh, PA and Santa Monica, CA  
2007 – “R: An open-source environment for data manipulation and analysis,” RAND Research Programming Department Course, Santa Monica, CA

## PROFESSIONAL SERVICE AND ACTIVITIES

- Principal Member, Department of Education IES Statistics and Modeling Scientific Review Panel, 2008 – 2010  
Invited Panelist, National Academy of Education Committee on Value-Added Methodology (VAM) for Instructional Improvement, Program Evaluation and Accountability, 2008  
Principal Member, What Works Clearinghouse Regression Discontinuity Standards Development Panel, 2008  
Member, Program Committee, WCER National Conference on Value Added Modeling, 2008  
Member, Department of Education IES Scientific Review Panel, 2007  
Member, Technical Working Group, IES Reading First Implementation Study, 2007 – present  
Invited Panelist, Roundtable Discussion on Value-Added Measurement, convened by the National Institute for Excellence in Teaching Working Group on Teacher Quality, 2007  
Awards Chair, American Statistical Association Statistical Computing and Graphics Sections, 2006 – present  
Webmaster, RAND Statistics Group, 2001 – 2005  
Member, American Statistical Association, 1996 – present  
Member, Institute of Mathematical Statistics, 1997 – present  
Member, International Society for Bayesian Analysis, 2002 – present  
Referee for *Journal of the American Statistical Association*, *Journal of Educational and Behavioral Statistics*, *Journal of Computational and Graphical Statistics*, *Environmental Science and Technology*, *Statistics in Medicine*, *Management Science*, *Bayesian Statistics 7*, *Multilevel Analysis of Education Data*, *Educational Evaluation and Policy Analysis*, *Journal of Educational Measurement*, *Education Finance and Policy*  
Consultant for University of Texas, National Board for Professional Teaching Standards, University of Kentucky, Louisiana State University, Northwestern University