

Brian Habing

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Education

Ph.D. in Statistics, University of Illinois at Urbana-Champaign, 1998
Specialization in Educational Measurement
Dissertation: Some Issues in Weak Local Independence in Item Response Theory
Advisor: Dr. William Stout

M.S. in Mathematics, University of Illinois at Urbana-Champaign, 1994

B.S. in Mathematics, University of Illinois at Urbana-Champaign, 1991
Cum Laude with High Distinction

Academic Positions

Associate Professor (Tenured) - Department of Statistics, University of South Carolina, 8/04 – present
Adjunct Associate Professor – Department of Educational Studies, 5/07 - present

Assistant Professor (Tenure Track) - Department of Statistics, University of South Carolina, 8/98 – 8/04

Graduate Fellow, Teaching Assistant, and Research Assistant - Department of Mathematics and
Department of Statistics, University of Illinois at Urbana-Champaign, 8/91 - 8/98

Research Interests

Psychometrics – Item Response Theory, Scale Construction, Multivariate Statistics, and Educational
Measurement

Articles in Press and Print

Alterman, A.I., Cacciola, J.S., Ivey, M.A., Habing, B. & Lynch, K.G. (in press). Reliability and validity of the alcohol SIP and a newly constructed drug SIP. Accepted to appear in the *Journal of Studies on Alcohol and Drugs*.

Froelich, A.G., & Habing, B. (2008). Conditional covariance based subtest selection for DIMTEST. *Applied Psychological Measurement*, 32, 138-155.

Finch, H. & Habing, B. (2007). Performance of DIMTEST and NOHARM based statistics for testing unidimensionality. *Applied Psychological Measurement*, 31, 292-307.

Alterman, A.I., Cacciola, J.S., Habing, B., & Lynch, K.G. (2007). ASI recent and lifetime summary indices based on nonparametric IRT models. *Psychological Assessment*, 19, 119-132.

Habing, B., Finch, H. & Roberts, J.S. (2005). A Q_3 statistic for unfolding item response theory models. *Applied Psychological Measurement*, 29, 457-471.

Finch, H. & Habing, B. (2005). Comparison of NOHARM and DETECT in item cluster recovery: counting dimensions and allocating items. *Journal of Educational Measurement*, 42, 149-169.

Habing, B., & Roussos, L.A. (2003). On the need for negative local item dependence. *Psychometrika*, 68, 435-452.

Habing, B. (2001). Nonparametric regression and the parametric bootstrap for local dependence assessment. *Applied Psychological Measurement*, 25, 221-233.

- Douglas, J., Kim, H.R., Habing, B., & Gao, F. (1998) Investigating local dependence with conditional covariance functions. *Journal of Educational and Behavioral Statistics*, 23, 129-151.
- Stout, W., Habing, B., Douglas, J., Kim, H.R., Roussos, L., & Zhang, J. (1996). Conditional covariance based nonparametric multidimensionality assessment. *Applied Psychological Measurement*, 20, 331- 354.
- Stout, W., Nandakumar, R., & Habing, B. (1996). Analysis of latent dimensionality of dichotomously and polytomously scored test data. *Behaviormetrika*, 23, 37-65.

Other Publications

- Habing, B. (2003). [Review of the book *Introduction to nonparametric item response theory*]. *Journal of the American Statistical Association*, 98, 774-775.
- Stout, W., Bolt, D., Goodwin Froelich, A., Habing, B., Hartz, S., & Roussos, L. (2003). *Development of a SIBTEST bundle methodology for improving test equity with applications for GRE® test development* (GRE Board Professional Report No. 98-15P). Princeton, NJ: Educational Testing Service.
- Habing, B., & Nitcheva, D. (2001) Boundary Correction for Kernel Smoothing IRF Estimation. *University of South Carolina Statistics Technical Report No. 209 62G08-01*.

Grants Funded

- National Science Foundation (Methodology, Measurement, and Statistics Program), “Item Response Theory Models for Mixtures of Dominances and Proximity Items”, 9/07-8/09, \$143,227 (\$100,326 to Statistics). Co-investigator with Christopher Zorn, Penn State University.
- South Carolina Dept. of Education, "Advanced Placement Teacher Institute in Statistics", 6/01-8/01, \$10,114; 3/03-6/03, \$12,029; and 2/05-6/05, \$15,278.
- National Science Foundation (Methodology, Measurement, and Statistics Program, and Statistics and Probability Program) , "Advances in Local Independence and Unidimensionality Assessment for Dichotomous and Polytomous Items", 5/01 - 4/06, \$114,954.
- University of South Carolina (Research and Productive Scholarship Award), “Unidimensional Locally Dependent Item Response Theory Model Based on the 3-PL Model and the Item Pair Conditional Covariances”, 1/99 - 1/00, \$5,241.

Seminars and Meeting Presentations

- “Describing and simulating multidimensional testing data.” Research and Development Seminar, Educational Testing Service, Princeton, NJ, April 16, 2008.
- “Assessing model fit in IRT using PPMC methodology without MCMC.” With Leslie Hendrix. Annual Meeting of the National Council on Measurement in Education, March 27, 2008, New York, NY.
- “Comparison of parametric and nonparametric IRT bootstrap methods for dimensionality assessment.” With Meng Wu. Annual Meeting of the National Council on Measurement in Education, March 27, 2008, New York, NY.
- “Correlation based measure of effect size for multidimensional IRT data.” With Jessalyn Smith. Annual Meeting of the National Council on Measurement in Education, March 27, 2008, New York, NY.
- “The impact of personal response systems in introductory statistics classes with large and small enrollments.” With Elizabeth Johnson, Christopher Craft, and Jessalyn Smith. Annual Meeting of the American Educational Research Association, March 27, 2008, New York, NY.
- “Vertical equating and dimensionality of a primary reading assessment.” With Tammiee Dickenson, Anita Rawls, and Robert Johnson. Annual Meeting of the National Council on Measurement in Education, March 27, 2008, New York, NY.
- “Multidimensional item response theory model estimation for non-normal abilities.” With Litong Zhang. Annual Meeting of the National Council on Measurement in Education, March 26, 2008, New York, NY.

- “Comparing the extended Tustakawa method with TESTFACT and NOHARM for MIRT Estimation.” With Litong Zhang. Annual Meeting of the American Educational Research Association, March 25, 2008, New York, NY.
- “Effectiveness of testlet model estimation with weighted least squares.” With Jessalyn Smith. Annual Meeting of the American Educational Research Association, March 25, 2008, New York, NY.
- “Measuring multidimensionality for IRT data.” CTB/McGraw-Hill, Monterey, CA, February 7, 2008.
- “‘Intuitive’ interpretation of multidimensional item response theory model parameters.” With Jessalyn Smith. International Conference on Advances in Interdisciplinary Statistics and Combinatorics, October 13, 2007, Greensboro, NC.
- “Using R for everyday research.” College of Education, Graduate Student Organization, University of South Carolina, October 1, 2007.
- “‘Intuitive’ interpretation of multidimensional item response theory model parameters.” With Jessalyn Smith. Annual Meeting of the National Council on Measurement in Education, April 10, 2007, Chicago, IL.
- “A comparison of the guessing parameter estimation for a multidimensional item response theory model.” With Litong Zhang. Annual Meeting of the National Council on Measurement in Education, April 10, 2007, Chicago, IL.
- “Rasch and 3PL ability estimates when the true model is multidimensional.” With Tammiee Dickenson. Annual Meeting of the American Educational Research Association, April 8, 2006, San Francisco, CA.
- “Some implications of conditional covariance theory for IRT data.” Educational Testing Service Statistics and Psychometrics Seminar Series, Princeton, New Jersey, September 22, 2005.
- “Advances in conditional covariance-based scale refinement.” Department of Biostatistics, University of South Carolina, November 19, 2004.
- “An introduction to item response theory.” Department of Biostatistics, University of South Carolina, November 5, 2004.
- “NOHARM goodness of fit statistic anomalies.” With Holmes Finch. Presented at the Annual Meeting of the National Council on Measurement in Education, April 14, 2004, San Diego, CA.
- “A comparison of conditional covariance methods and Mokken scaling for scale refinement.” With Dorota Staniewska. Presented at the Annual Meeting of the American Educational Research Association, April 13, 2004, San Diego, CA.
- “A (biased)? look at differential item functioning.” Center for Intervention & Services Research, University of Pennsylvania. March 22, 2004.
- “Comparison of NOHARM and DETECT in item cluster recovery: counting dimensions and allocating items.” With Holmes Finch and Huynh Huynh. Presented at the Annual Meeting of the National Council on Measurement in Education, April 24, 2003.
- “Comparison of NOHARM and conditional covariance methods of dimensionality assessment.” With Holmes Finch and Huynh Huynh. Presented at the Annual Meeting of the American Educational Research Association, April 21, 2003, Chicago, IL.
- “A study of methods for selecting the AT subtests in the DIMTEST procedure.” With Amy G. Froelich. Presented at the Annual Meeting of the Psychometric Society in Chapel Hill, NC, June 22, 2002.
- “A Q3 statistic for unfolding item response theory models.” With Holmes Finch, James Roberts, and Ratna Nandakumar. Presented at the Annual Meeting of the American Educational Research Association, April 1, 2002, New Orleans, LA.
- “Refinements of the DIMTEST methodology for testing unidimensionality and local independence.” With Amy G. Froelich. Presented at the Annual Meeting of the National Council on Measurement in Education, April 11, 2001, Seattle, WA.

"On the Need for Negative Local Item Dependence." Department of Statistics, University of Georgia. September 14, 2000.

"The problem of dimensionality in large scale educational assessment." Presented at the 2000 SRCOS/ASA Summer Research Conference in Statistics in Williamsburg, VA, June 4-8, 2000.

"Applications of the data image to testing data." With R. Webster West. Presented at the Annual Meeting of the National Council on Measurement in Education, in New Orleans, LA, April 25-27, 2000.

"Nonparametric IRF estimation and local dependence assessment." Presented at the 11th European Meeting of the Psychometric Society, in Lueneburg, Germany, July 19-22, 1999.

"Optimization of kernel smoothing for IRF estimation." Presented at the Annual Meeting of the National Council on Measurement in Education, in Montreal, Canada, April 20-22, 1999.

"Directed item-cluster assessment." With Sarah Hartz. Presented at the Annual Meeting of the National Council on Measurement in Education, in Montreal, Canada, April 20-22, 1999.

"A model for item response data with pairwise local dependence." With Louis Roussos. Presented at the Annual Meeting of the National Council on Measurement in Education in San Diego, CA, April 14-16, 1998.

"Local dependence assessment for exams with polytomous items and incomplete item examinee layouts." With William Stout and John Donoghue. Presented at the Annual Meeting of the National Council on Measurement in Education in Chicago, IL, March 25-27, 1997.

"A further characterization of unidimensionality based on item orbits." With William Stout. Presented at the Annual Meeting of the Psychometric Society in Gatlinburg, TN, June 26-29, 1997.

"Estimation of conditional covariance at each level of examinee ability." Presented at the Annual Meetings of the National Council on Measurement in Education and the American Educational Research Association in Chicago, IL, March 24-28, 1997.

"A rescaling of the conditional covariance of item pairs." Presented at the Annual Meeting of the Psychometric Society in Banff, Alberta, Canada, June 27-30, 1996.

Sessions Discussed or Organized

"Nonparametrics: General & Pedagogical." Session Chair. Current and Future Trends in Nonparametrics, October 11, 2007, Columbia, SC.

"Multidimensional Item Response Theory." Training Session Co-leader with Amy Froelich. (\$90 fee to attend). Annual Meeting of the National Council on Measurement in Education, April 19, 2007, Chicago, IL.

"Issues in Score Equating." Paper Session Discussant. Annual Meeting of the National Council on Measurement in Education, April 9, 2006, San Francisco, CA.

"Models for Cognitive Diagnosis and Processing." Session Discussant. New Directions in Psychological Measurement with Model-Based Approaches Conference, February 17, 2006, Georgia Institute of Technology, Atlanta, GA.

"Dimensionality: Truth and Consequences." Paper Session Discussant. Annual Meeting of the National Council on Measurement in Education, April 14, 2005, Montreal, Quebec.

"Multidimensional Item Response Theory." Training Session Co-leader with Amy Froelich. (\$90 fee to attend). Annual Meeting of the National Council on Measurement in Education, April 10, 2005, Montreal, Quebec.

"Differential Item Functioning: The State of the Art." Symposium Organizer. Annual Meeting of the National Council on Measurement in Education, April 12, 2001, Seattle, WA.

B.S., M.I.S., and M.S. Students Directed in Statistics

Senior Honors Thesis

Jamie Winterton, 2000
Barth Kelly, 2001

Master of Industrial Statistics

Chris Finney, 2003
Randy Ewart, 2006
Mariana Toma-Drane, 2006
April Bolin, 2008
Lisa Dilks, 2008
Renee Dowdy, 2008

Master of Science

Beth Beard, 2002
Sharon Dziuba, 2002
Dorota Staniewska, 2002
Alex McLain, 2005
Chaitali Datta, 2006
Jessalyn Smith, 2006
Cristina Ungureanu, 2007
Brenna Veale, 2007
Barth Kelly, 2008
Yuling Feng, in progress

Doctoral Students Directed in Statistics (*with initial appointment*)

Roland Deutsch, 2007 (co-chaired with John Grego) – Assistant Professor of Statistics, University of North Carolina at Greensboro
Litong Zhang, 2007 – Research Scientist at CTB/McGraw Hill
Meng Wu, 2008 – Associate Psychometrician at Educational Testing Service
Leslie Hendrix, in progress
Tan Li, in progress
Na Yang, in progress

Doctoral Students Directed in Educational Psychology and Research (*with initial appointment*)

Holmes Finch, 2002 (co-chaired with Huynh Huynh) – Assistant Professor of Educational Psychology at Ball State University
Tammiee Dickenson, 2005 (co-chaired with Michael Seaman) – Director and Research Assistant Professor, Office of Program Evaluation at USC
Beth Johnson, in progress (co-chaired with Robert Johnson)
Jessalyn Smith, in progress (co-chaired with Christine DiStefano)

Courses Taught at the University of South Carolina

SCCC 312 – Proseminar in Statistics	STAT 599 – AP Statistics for Teachers (x3)
STAT 110 – Introduction to Descriptive Statistics	STAT 702 – Introduction to Statistical Theory I (x2)
STAT 513 – Theory of Statistical Inference	STAT 703 – Introduction to Statistical Theory II (x2)
STAT 515 – Statistical Methods I (x10)	STAT 718 – Statistical Rating Methods
STAT 516 – Statistical Methods II (x6)	STAT 730 – Multivariate Analysis
STAT 518 – Nonparametric Statistical Methods (x4)	STAT 740 – Statistical Computing
STAT 530 – Applied Multivariate Statistics (x3)	STAT 778/EDRM 828 – Item Response Theory (x2)

Course Development

Revamped and updated bulletin description for STAT 515 – Statistical Methods I
Revamped and updated bulletin description for STAT 516 – Statistical Methods II
Co-created STAT 530 – Applied Multivariate Statistics, with Don Edwards in Statistics
Co-created STAT 591/SMED 591 – Data Analysis for Teachers, with Don Jordan in Science Education
Co-created STAT 778/EDRM 828 – Item Response Theory, with Huynh Huynh in Educational Studies

Teaching Honors

Nominated for Michael J. Mungo Undergraduate Teaching Awards 2001 and 2005 (finalist) and Michael J. Mungo Graduate Teaching Award 2006 and 2008 (finalist).

1994 University of Illinois, Department of Mathematics, Teaching Assistant Instructional Award.

Incomplete List of Excellent Instructors at the University of Illinois three times. For courses taught Spring 1992, Spring 1994, and Fall 1994 - an all university student selected honor.

Society Memberships

American Educational Research Association

American Statistical Association

National Council on Measurement in Education

Psychometric Society

Selected Professional Service

Statistical Methodology Editor for the *Journal of the First Year Experience and Students in Transition*, 1998-2004.

Co-chair for the 2004 Annual Meeting Program Committee for Division D of the American Educational Research Association

Reviewer for the Methodology, Measurement, and Statistics program of NSF

Review panel member for the National Institutes of Mental Health

AP Reader for the Statistics Exam. 2005-2008.

Article reviewer for *Applied Psychological Measurement*; *Controlled Clinical Trials: Design, Methods, & Analysis*; *Electronic Journal of Statistics*; *Journal of Educational & Behavioral Statistics*; *Journal of Educational Measurement*; *Journal of Statistical Computation and Simulation*; *Psychological Methods*; *Psychometrika*; and *Statistics in Medicine*.

Presentation proposal reviewer for the 1999-2008 National Council on Measurement in Education and 2005-2009 American Educational Research Association Annual Meetings

Past President and Webmaster for the South Carolina Chapter of the American Statistical Association.

South Carolina Region II Science Fair Judge - 1999-2001, 2003-2006.

Selected Department, College, and University Service

Department of Statistics

Faculty Search Committee 8/98 – 8/05

Undergraduate Advisor 8/00 – 8/04

Graduate Director 10/04 – 6/07

Program of Educational Psychology, Research, and Foundations

Faculty Search Committee 1/00 – 4/00

Research Consortium on Children and Families

Faculty Search Committee 8/05 – 4/07

College of Science and Math

Petitions and Standards Committee 8/00 – 8/05

Curriculum Committee 8/07 – present

University

Faculty and Staff Moving Crew Volunteer 8/99 – present

Assessment Advisory Committee 8/00 – 8/02

Graduate Council (Chair 8/06-7/07) 8/04 – 7/07