

## 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  
Adjunct Associate Professor – Experimental Psychology Program, 12/08 – 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

- Li, T., Habing, B., & Roussos, L. (in press). Conditional covariance based subtest selection for polytomous DIMTEST. Accepted for publication in *Applied Psychological Measurement*.
- Heiney, S.P., Gullatte, M., Hayne, P.D. Powe, B., & Habing, B. (2016). Fatalism revisited: Further psychometric testing across two studies. *Journal of Religion and Health*, 55 (4), 1472-1481.
- Deutsch, R., Habing, B. & Piegorsch, W.W. (2014). A PAV-algorithm approach to detect infinite parameter estimates in one-regressor dose-response models with asymptotes. *Journal of Statistical Computation and Simulation*, 84 (12) 2545-2556.
- Feng, Y., Habing, B., & Huebner, A. (2014). Parameter estimation of the reduced RUM using the EM algorithm. *Applied Psychological Measurement*, 38 (2), 137-150.
- Cacciola, J.S., Alterman, A.I., Habing, B., & McClellan, A.T. (2011). Recent status scores for version 6 of the Addiction Severity Index (ASI-6). *Addiction*, 106, 1588-1602.
- Deutsch, R.C., Grego, J.M., Habing, B., & Piegorsch, W.W. (2010). Maximum likelihood estimation with binary-data regression models: small-sample and large-sample features. *Advances and Applications in Statistics*, 14, 101-116.
- Alterman, A.I., Cacciola, J.S., Ivey, M.A., Coviello, D.M., Lynch, K.G., Dugosh, K.L., & Habing, B. (2010). Relationship of mental health and illness in substance abuse patients. *Personality and Individual Differences*, 49, 880-884.

- Alterman, A.I., Cacciola, J.S., Ivey, M.A., Habing, B. & Lynch, K.G. (2009). Reliability and validity of the alcohol short index of problems and a newly constructed drug short index of problems. *Journal of Studies on Alcohol and Drugs*, 70: 34-307.
- 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 (no cost extension through 8/10), \$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 - 4/04 (no cost extension through 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.

## **Recent Seminar and Meeting Presentations (*Since August, 2010; 50 others beginning June, 1996*)**

- "Alternative Test Structures and their Effect on Item Information." With Louis Roussos. International Meeting of the Psychometric Society, July 13, 2016, Asheville, NC.
- "Non-compensatory MIRT with Rotation." With Xinchu Zhao. International Meeting of the Psychometric Society, July 12, 2016, Asheville, NC.
- "Modifying Mantel-Haenzel DIF Detection Hypotheses to Include Effect Size." With Philip Sherlock. Graduate Student Poster Session, National Council on Measurement in Education. April 18, 2015, Chicago.
- "Impact of ICC Model Misspecification on CAT." With Han Lee and Jessalyn Smith. Annual Meeting of the National Council on Measurement in Education, April 4, 2014, Philadelphia, PA.
- "Bayesian Simulation." Research seminar. Department of Statistics, University of South Carolina, April 5, 2013.
- "Effect of Model Formulation in IRT." Hard Data Cafe seminar. Department of Psychology, University of South Carolina, November 15, 2013.
- "Making Fair Comparisons Between the Compensatory Model and Noncompensatory Mode." with Yin Fu. Annual Meeting of the National Council on Measurement in Education, April 29, 2013, San Francisco, CA.
- "OpenBUGS for the Two- and Three-Parameter Logistic Models in Item Response Theory." With Leslie Hendrix. Annual Meeting of the American Educational Research Association, April 15, 2012, Vancouver, BC.
- "Mokken Scaling for Items with Varying Numbers of Response Categories." With Yin Fu. Annual Meeting of the National Council on Measurement in Education, April 15, 2012, Vancouver, BC.
- "Q Matrix Validation Method for the Reduced RUM." With Yuling Feng. Annual Meeting of the National Council on Measurement in Education, April 15, 2012, Vancouver, BC.
- "The effects of test length on scoring methods and scale score distributions." With Litong Zhang, Jessalyn Smith, and Joanna Tomkowicz. Annual Meeting of the National Council on Measurement in Education, April 16, 2012, Vancouver, BC.
- "Estimating posterior distributions in item response theory." Lecture Series in Computational Mathematics, University of North Carolina Greensboro, Greensboro, NC, September 22, 2011.
- "Parameter estimation of the rRUM using the E-M algorithm." With Yuling Feng. Annual Meeting of the National Council on Measurement in Education, April 10, 2011, New Orleans, LA.
- "The influence of the variable compensation IRT model on conditional covariances." With Tan Li. Annual Meeting of the National Council on Measurement in Education, April 10, 2011, New Orleans, LA.
- "Comparison of EM+E Method to MCMC Including PPMC Checks." With Leslie Hendrix. Annual Meeting of the National Council on Measurement in Education, April 9, 2011, New Orleans, LA.
- "Parametric bootstrap versus computationally fast posterior predictive model checking (PPMC) for item response theory model fit." With Leslie Hendrix. Annual Meeting of the American Educational Research Association, April 9, 2011, New Orleans, LA.
- "Simulation model for complex structure exams." With Beth Johnson. Annual Meeting of the American Educational Research Association, April 9, 2011, New Orleans, LA.
- "Improved conditional covariance-based subtest selection for polytomous item DIMTEST." With Tan Li. Annual Meeting of the American Educational Research Association, April 8, 2011, New Orleans, LA.
- "Some pitfalls of methodological zealotry." Quantitative Psychology Brown Bag Series, Georgia Tech, Atlanta, GA, December 9, 2010.

### **Sessions Discussed, Chaired, or Organized (*Since August, 2010; 11 others beginning April, 2001*)**

"Item Response Theory." Session Organizer and Chair. Latent Variables 2016, October 13, 2016, Columbia, SC.

"Item Response Theory." Session Chair. International Meeting of the Psychometric Society, July 13, 2016, Asheville, NC.

"An Introduction to Using R for Quantitative Methods". Training session co-organizer/instructor at the National Council of Measurement in Education with Jessalyn Smith. April 16, 2015, Chicago.

"An Introduction to R for Teachers of Quantitative Methods". Training Session Co-leader with Jessalyn Smith at the Annual Meeting of the National Council on Measurement in Education, April 26, 2013, San Francisco, CA.

"Multivariate". Paper Session Discussant. Annual Meeting of the National Council on Measurement in Education, April 28, 2013, San Francisco, CA

"Dimensionality Assessment: Theory and Practice." Paper Session Discussant. Annual Meeting of the National Council on Measurement in Education, April 14, 2012, Vancouver, BC.

"Item Response Theory." Round Table Session Chair. Annual Meeting of the American Educational Research Association, April 17, 2012, Vancouver, BC.

"Assessing the Quality of Inference from Diagnostic Classification Models." Paper Session Discussant. Annual Meeting of the National Council on Measurement in Education, April 11, 2011, New Orleans, LA.

"Managing Simulation Studies with R." Training Session Co-leader with Jessalyn Smith. (\$50 fee to attend). Annual Meeting of the National Council on Measurement in Education, April 7, 2011, New Orleans, LA.

"Using R for Everyday Research." Training Session Co-leader with Jessalyn Smith. (\$50 fee to attend). Annual Meeting of the National Council on Measurement in Education, April 7, 2011, New Orleans, LA

### **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, 2011 – Instructor, University of South Carolina

Tan Li, 2011 – Visiting Assistant Professor of Biostatistics, Florida International University

Yuling Feng, 2013 – Senior Statistical Analyst

Na Yang, 2013 – Senior Statistician at AdvanceMed

Yin Fu, 2015 – Quantitative Associate at Wells Fargo

Han Lee, in progress

Xinchu Zhao, 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, 2009 (co-chaired with Robert Johnson) – Visiting Assistant Professor, The College of New Jersey

Jessalyn Smith, 2009 (co-chaired with Christine DiStefano) - Research Scientist at CTB/McGraw Hill

Maureen Petkewich, 2016 (co-chaired with Christine DiStefano) – Senior Instructor and Assistant Chair, University of South Carolina

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

### Senior Honors Thesis

Jamie Winterton, 2000  
Barth Kelly, 2001  
James Wu, 2010  
Jonathan Tregde, in progress

### Master of Industrial Statistics

Chris Finney, 2003  
Randy Ewart, 2006  
Mariana Toma-Drane, 2006  
April Bolin, 2008  
Lisa Dilks, 2008  
Renee Dowdy, 2008  
Erika Rhett, 2009

### 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  
William Smith, in progress

## **Courses Taught at the University of South Carolina (2/2 load except 1/1 while graduate director)**

SCCC 312 – Proseminar in Statistics	STAT 600 – Statistics for Applied Management (x4)
STAT 110 – Introduction to Statistical Reasoning (x6)	STAT 700 – Applied Statistics I (x4)
STAT 511/MATH 511 – Probability	STAT 701 – Applied Statistics II (x4)
STAT 512 – Mathematical Statistics (x2)	STAT 702 – Introduction to Statistical Theory I (x2)
STAT 513 – Theory of Statistical Inference (x2)	STAT 703 – Introduction to Statistical Theory II (x2)
STAT 515 – Statistical Methods I (x18)	STAT 718 – Statistical Rating Methods
STAT 516 – Statistical Methods II (x8)	STAT 730 – Multivariate Analysis (x3)
STAT 518 – Nonparametric Statistical Methods (x4)	STAT 740 – Statistical Computing
STAT 530 – Applied Multivariate Statistics (x4)	STAT 778/EDRM 828 – Item Response Theory (x6)
STAT 599 – AP Statistics for Teachers (x3)	

## **Course and Curricular Development**

Revamped and updated bulletin description for STAT 515 – Statistical Methods I  
Revamped and updated bulletin description for STAT 516 – Statistical Methods II  
Chaired re-creation of STAT 510 – Applied Stochastic Processes  
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  
Created STAT 600 – Statistics for Applied Management  
Co-created STAT 778/EDRM 828 – Item Response Theory, with Huynh Huynh in Educational Studies  
Co-created the Minor in Data Science with Jed Lyons and Manton Matthews in Engineering, and John Grego and David Hitchcock in Statistics  
Revised the Minor in Risk Management and Insurance with Doug Meade in Mathematics and Jean Helwege and Gregory Niehaus in Finance  
Co-created the Minor in Secondary Education Mathematics with Ed Dickey and Jan Yow in Education

## **Teaching Honors**

Nominated for Michael J. Mungo Undergraduate Teaching Awards 2001, 2005 (finalist), and 2009, 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.

## **Current Society Memberships**

National Council on Measurement in Education  
Psychometric Society

## Selected Professional Service

Associate Editor for the *Journal of Statistical Computation and Simulation*, 2009-present.

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, 2005-2009.

Article reviewer for *Alcoholism: Clinical and Experimental Research*; *Applied Psychological Measurement*; *Bernoulli Journal*; *British Journal of Mathematical and Statistical Psychology*; *Controlled Clinical Trials: Design, Methods, & Analysis*; *Educational and Psychological Measurement*; *Electronic Journal of Statistics*; *Evaluation and Health Professions*; *Journal of Classification*; *Journal of Educational & Behavioral Statistics*; *Journal of Educational Measurement*; *Journal of Multivariate Analysis*; *Journal of Statistical Computation and Simulation*; *Journal of the American Statistical Association*; *Psychological Assessment*; *Psychological Methods*; *Psychometrika*; and *Statistics in Medicine*.

Presentation proposal reviewer for the 1999-2008, 2011-2013, 2016 National Council on Measurement in Education and 2005-2009, 2012-2015 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
Undergraduate Director	8/09 – 6/16

### Program of Educational Psychology, Research, and Foundations

Faculty Search Committee	1/00 – 4/00
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### Research Consortium on Children and Families

Faculty Search Committee	8/05 – 4/07
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### College of Arts and Sciences

Petitions and Standards Committee (COSM)	8/00 – 8/05
Curriculum Committee (Chair 9/14-present)	8/07 – 8/10, 2/12-8/12, 9/14-present

### University

Faculty and Staff Moving Crew Volunteer	8/99 – 8/12
Assessment Advisory Committee	8/00 – 8/02
Graduate Council (Chair 8/06-7/07)	8/04 – 7/07
QEP Technology Committee Co-Chair	8/10 – 3/11
USC Connect Director Search Committee	5/11 – 7/11
Faculty Senate Committee on Curricula and Courses (Chair)	8/12 – 9/14
Faculty Senate Steering Committee	8/12 – 9/14
University Carolina Core Committee	8/12 – present
University Academic Program Liaison Committee	8/12 – 9/14
Director of Institutional Assessment and Compliance Search Committee	4/13 – 7/13