

## Brian Habing

Department of Statistics  
University of South Carolina  
Columbia, SC 29208  
Phone: (803)777-3578  
Fax: (803)777-4048

1708 Sewanee Drive  
West Columbia, SC 29169  
Phone: (803)739-2686

e-mail: habing@stat.sc.edu

### 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

- Deutsch, R.C., Grego, J.M., Habing, B., & Piegorsch, W.W. (in press). Maximum likelihood estimation with binary-data regression models: small-sample and large-sample features. To appear in *Advances and Applications in Statistics*.
- Alterman, A.I., Cacciola, J.S., Ivey, M.A., Habing, B. & Lynch, K.G. (2009). Reliability and validity of the alcohol SIP and a newly constructed drug SIP. *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”, 9/07-8/10, \$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 - 4/06, \$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 (*Previous five years; 19 others beginning June, 1996*)**

- “An alternative IRT model that accounts for guessing appropriately.” With Jessalyn Smith. Annual Meeting of the American Educational Research Association, April 16, 2009, San Diego, CA.
- “MCMC estimation of the 3PL model using tsutakawa’s prior parameterization.” With Leslie Hendrix. Annual Meeting of the National Council on Measurement in Education, April 14, 2009, San Diego, CA.
- “Distinguishing monotone and unfolding items when both are present.” With Na Yang. Annual Meeting of the National Council on Measurement in Education, April 14, 2009, San Diego, CA.
- “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.

### **Sessions Discussed or Organized**

- “Multidimensionality.” Paper Session Discussant. Annual Meeting of the National Council on Measurement in Education, April 15, 2009, San Diego, CA.
- “Managing Simulation Studies with R.” Training Session Co-leader with Jessalyn Smith. (\$40 fee to attend). Annual Meeting of the National Council on Measurement in Education, April 12, 2009.
- “Using R for Everyday Research.” Training Session Co-leader with Jessalyn Smith. (\$40 fee to attend). Annual Meeting of the National Council on Measurement in Education, April 12, 2009.
- “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  
James Wu, 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

### **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  
Yuling Feng, in progress  
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, 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

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

SCCC 312 – Proseminar in Statistics	STAT 700 – Applied Statistics I
STAT 110 – Introduction to Descriptive Statistics (x2)	STAT 701 – Applied Statistics II
STAT 512 – Mathematical Statistics	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 (x10)	STAT 718 – Statistical Rating Methods
STAT 516 – Statistical Methods II (x7)	STAT 730 – Multivariate Analysis
STAT 518 – Nonparametric Statistical Methods (x4)	STAT 740 – Statistical Computing
STAT 530 – Applied Multivariate Statistics (x4)	STAT 778/EDRM 828 – Item Response Theory (x3)
STAT 599 – AP Statistics for Teachers (x3)	

## **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, 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.

## **Society Memberships**

American Educational Research Association  
American Statistical Association  
National Council on Measurement in Education  
Psychometric Society

## **Selected Professional Service**

Associate Editor for the *Journal of Statistical Computation and Simulation*, 2009-  
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 *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
Undergraduate Director	8/09 – present
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