VITA

Brian William Junker

General Information

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Academic Training

Undergraduate Work:	B.A., Mathematics, University of Minnesota, 1980
Graduate Work:	M.S., Mathematics, University of Illinois, 1986
	Ph.D., Statistics, University of Illinois, 1988

Research Interests

Mixture and hierarchical models for multivariate discrete measures; Nonparametric, semiparametric and parametric inference for latent variable models; Social network modeling and analysis; Applications in Education, Psychology, the Social Sciences, and Biostatistics.

Honors

Fellow, American Educational Research Association. Inducted April 2014.
Statistician of the Year, Pittsburgh Chapter of the American Statistical Association. May 2011.
President, Psychometric Society. Elected Spring 2007 for August 2008 – July 2009 term.
Fellow, Institute of Mathematical Statistics. Elected March 2000.

Appointments

INSTITUTION	POSITION	DATES
Carnegie Mellon University (Pittsburgh, PA)	Professor Emeritus, Statistics	July 2023–present
	Affiliated Faculty, Heinz School	October 2013–present
	Associate Dean, Dietrich College	August 2012–July 2019
	Professor of Statistics	July 2001–June 2023
	Associate Professor, Statistics	July 1996–June 2001
	Assistant Professor, Statistics	August 1991–June 1996
Learning Research and Development Center, Univ. of Pittsburgh	Center Associate	August 2001–present
	Visiting Res. Scientist	September 1999–July 2000
Carnegie Mellon University (Pittsburgh, PA)	Postdoctoral Fellow, Program in Psychiatric Statistics	August 1990–December 1993
University of Illinois (Champaign, IL)	Visiting Assistant Professor of Statistics	August 1988–May 1990

Research Grants

Just-In-Time Math Access Points for Grade-Level Success. Submitted, IES (US Dept of ED), tracking #GRANT13305961. August 2021–July 2024. With Carnegie Learning Inc. & PI Vincent Aleven, Human Computer Interaction Institute, Carnegie Mellon University.

Hierarchical Network Models: Mediation and Influence. (Subcontract.) IES (US Dept of ED) Award #305D150045. July 2015 - June 2019. PI Tracy Sweet, University of Maryland.

Developing a survey of college-relevant social capital among high school youth. Spencer Foundation. October 2013–July 2014. Co-PI with Sarah Ryan, CMART postdoc, Department of Statistics, Carnegie Mellon.

The Expanded Hierarchical Rater Model: A Framework for the Analysis of Ratings. National Science Foundation, Measurement Methodology and Statistics program, Award #SES-1324587. Principal Investigator, with Co-PI Jodi Casabianca, University of Texas at Austin. August 28, 2013–August 31, 2016.

Hierarchical Models for the Formation and Evolution of Ensembles of Social Networks. National Science Foundation, Measurement Methodology and Statistics program, award #SES-1229271. Principal Investigator, with Co-PI Andrew Thomas. September 2012–August 2014.

Hierarchical Network Models for Education Research. IES (US Dept of ED) Award #R305D120004. Principal Investigator, with Co-PI Andrew Thomas (Carnegie Mellon) and collaborator Tracy Sweet (Univ. Maryland). `http://hnm.stat.cmu.edu`. July 2012–June 2015.

Making Longitudinal Web-Based Assessment Give Cognitively Diagnostic Reports to Teachers, Parents and Students While Employing Mastery Learning. 082162201 (DoEd R305A070440) Subcontract with Worcester Polytechnic Institute (Department of Education). Co-investogator with Niel Heffernan (WPI), PI; Ken Koedinger (CMU), Co-PI. 7/1/07 – 6/30/11.

Carnegie Mellon and Rand Traineeships (CMART) in Methodology and Interdisciplinary Research. IES (US Dept of Ed) Award #R305B100012. `http://cmart.stat.cmu.edu`. Principal Investigator. 07/01/2010 – 06/30/2015

Learning Leadership: Kernel Routines for Instructional Improvement. IES (US Dept of ED) Award #R305A100289. Co-investigator, with Jim Spillane, Northwestern Univ, PI; Lauren Resnick & Rip Correnti, Univ of Pgh, Co-PI's. 03/01/2010 – 02/28/2013 (approx).

Content-focused coaching for high quality reading instruction. Subcontract to grant from Institute for Educational Sciences, U.S. Department of Education. Lindsay Clare Matsumura (PI) Lauren Resnick (Co-PI), and Donna Bickel (Co-PI), all of Learning Research and Development Center, University of Pittsburgh. July 2006–June 2010.

Program in Interdisciplinary Educational Research (PIER). Predoctoral Interdisciplinary Research Training Program in the Education Sciences, Institute of Educational Sciences, U.S. Department of Education, grant #R305B04063. Member of Steering Committee & Participating Faculty. David Klahr, (PI, Psychology, Carnegie Mellon), August 2004–July 2009.

LearnLab: Pittsburgh Science of Learning Center. Affiliated Faculty. Kenneth Koedinger (PI, Carnegie Mellon), David Klahr (Co-PI, Carnegie Mellon), Kurt VanLehn (Co-PI, University of Pittsburgh). NSF Grant #SBE-03-54420. October 2004–September 2009.

Using a Web-based Cognitive Assessment System for Predicting Student Performance on State Exams. Co-PI, with Ken Koedinger (PI, HCII, Carnegie Mellon), Steve Ritter (Carnegie Learning, Pittsburgh) and Neil Heffernan (Computer Science, Worcester Polytechnic Institute). US Department of Education Grant #R305K030140, Institute of Educational Sciences. August 25, 2003 to August 24, 2007.

VIGRE in Statistics at Carnegie Mellon. PI (July 2004–June 2006) PI, with Robert E. Kass and Kathryn Roeder (Co-PI's, Statistics, Carnegie Mellon). NSF Award #DMS-0240019. July 1, 2003 to June 30, 2006.

Dynamic scaffolding to improve learning and transfer of hidden skills. Co-PI, with Marsha C. Lovett (PI, Psychology), Joel B. Greenhouse (Co-PI, Statistics), Kenneth R. Koedinger (Co-PI, Human-Computer Interaction), Robert E. Kass (Co-PI, Statistics). National Science Foundation (SBES), grant #REC-00.87632. September 2000–August 2003.

Classroom use and efficacy of an automated reading tutor that listens. With David J. Mostow (PI, Robotics Institute), Albert T. Corbett (Robotics Institute). National Science Foundation (IERI), grant #REC-99.79894. October 1999–September 2002.

Statistical models for monitoring educational progress. Mid-Career Methodological Opportunities Fellowship partially supporting sabbatical leave at the Learning Research and Development Center, University of Pittsburgh. National Science Foundation (MMS), grant #SES-99.07447. September 1999–August 2000.

Vertical and horizontal integration of research and education in Statistics and Mathematical Sciences at Carnegie Mellon University. With William F. Eddy (Statistics), James M. Greenberg (Math Sciences), Robert E. Kass (Statistics), John P. Lehoczky (Statistics), Kathryn Roeder (Statistics), Stephen E. Schreve (Math Sciences), William O. Williams (Math Sciences). NSF grant #, July 1999–June 2002.

Latent variable models in action: hierarchical Bayes and mixture models for repeated discrete measures with individual differences. Principal Investigator. National Science Foundation (DMS and MMS), grant #DMS-97.05032. July 1997–June 2000.

Learning and intelligent systems: A next-generation intelligent learning environment for statistical reasoning. National Science Foundation (REC and EHR), grant #LIS-97.20354. January 1998–December 2000. With Marsha C. Lovett (PI; Psychology and Center for Innovation in Learning, CMU), Michael M. Meyer, Joel B. Greenhouse, and Robert E. Kass (all of Statistics, CMU).

Comprehensive methodology for the analysis of rater errors and their impact on NAEP. National Center for Educational Statistics, U.S. Department of Education. National Assessment of Educational Progress Secondary Analysis Program for 1998–1999. With Richard J. Patz (PI; CTB/Mcgraw-Hill), Mark R. Wilson and Macheld Hoskens (both of University of California, Berkeley).

Theory and applications of latent variable and mixture models for repeated measurements. Principal Investigator. National Science Foundation (DMS and MMS), grant #DMS-94.04438. July 1994–June1996.

Bayesian methods in biostatistics. 1994–1999. National Institutes of Health (National Cancer Institute), grant #CA54852. With Joel Greenhouse (PI), Rob Kass, Isa Verdinelli, and Larry Wasserman.

Research in nonparametric latent variable models. CMU Faculty Development Fund grant for foreign research travel. Presentations at July 1993 Psychometric Society meeting in Barcelona, Spain. Visited Klaas Sijtsma, University of Utrecht; Ivo Molenaar, Groningen University; Jules Ellis, University of Nijmegen.

Personality and depression: Analysis of existing data sets. MacArthur Foundation Mental Health Research Network, May 1992–April 1993. Co-PI with P. A. Pilkonis, (WPIC, University of Pittsburgh).

AASERT: Statistical expertise in psychological measurement and cognitive diagnosis. Add-on support for ONR grant #N00014-91-J-1208 (see next item) for one full graduate student (1992–1995) in work leading to a Ph.D. in Statistics oriented toward cognitive/psychological measurement applications. Principal Investigator.

Structural robustness and local dependence in item response theory (revised). November 1990–October 1992, Office of Naval Research grant #N00014-91-J-1208 to Carnegie Mellon University (CMU). Principal Investigator.

Structural robustness and local dependence in item response theory. April 1990–September 1990. Office of Naval Research grant #N00014-90-J-1984 to University of Illinois at Urbana-Champaign (UIUC). Principal Investigator.

Publications

Wu, W., Niezink, N., & Junker, B. (2022). A diagnostic framework for the Bradley-Terry model. *Journal of the Royal Statistical Society Series A: Statistics in Society, 185(Supplement_2),* S461-S484.

Spencer, N., Junker, B., & Sweet, T. (2022). Faster MCMC for Gaussian latent position network models. *Network Science, 10(1),* 20–45. `doi:10.1017/nws.2022.1` Also available as arXiv preprint arXiv:2006.07687.

Adhikari S., Sweet T. & Junker B. (2021) Analysis of longitudinal advice-seeking networks following implementation of high stakes testing. *J R Stat Soc Series A, 184,* 1475- 1500. Available at https://doi.org/10.1111/rssa.12708

Adhikari, S., Lecci, F., Becker, J. T., Junker, B. W., Kuller, L. H., Lopez, O. L., & Tibshirani, R. J. (2019). High-dimensional longitudinal classification with the multinomial fused lasso. *Statistics in Medicine, 38,* 2184–2205. See also http://arxiv.org/abs/1501.07518

Popov, M., Molsberry, S.A., Lecci, F., Junker, B., Kingsley, L.A., Levine, A., Martin, E., Miller, E., Munro, C.A., Ragin, A. & Seaberg, E. (2019). Brain structural correlates of trajectories to cognitive impairment in men with and without HIV disease. *Brain Imaging and Behavior,* 1–9.

Ryan, S., & Junker, B. W. (2019). The development and testing of an instrument to measure youth social capital in the domain of postsecondary transitions. *Youth & Society, 51,* 170–192.

Casabianca, J. M., Junker, B. W., Nieto, R., & Bond, M. A. (2017). A hierarchical rater model for longitudinal data. *Multivariate Behavioral Research, 52,* 576–592.

Kaufman, J. H., Stein, M. K., & Junker, B. (2016). Factors Associated with Alignment between Teacher Survey Reports and Classroom Observation Ratings of Mathematics Instruction. *The Elementary School Journal, 116(3),* 339–364.

Sweet, T. M., & Junker, B. W. (2016). Power to detect intervention effects on ensembles of social networks. *Journal of Educational and Behavioral Statistics, 41,* 180–204.

Lecci, F., Junker, B., Kuller, L. H., Lopez, O. L., & Becker, J. T. (2015). Empirically derived trajectories to dementia over 15 years of follow-up identified by using mixed membership models. *American Journal of Epidemiology, 182,* 366–374.

Molsberry, S.A., Lecci, F., Kingsley, L., Junker, B., Reynolds, S., Goodkin, K., Levine, A.J., Martin, E., Miller, E.N., Munro, C.A., Ragin, A., Sacktor, N., and Becker, J.T. (2015). Mixed membership trajectory models of cognitive impairment in the multicenter AIDS cohort study. *AIDS: Official Journal of the International AIDS Society.* Available online (http://journals.lww.com/ aidsonline/Abstract/publishahead/Mixed_membership_trajectory_models_of_cognitive.98166.aspx).

Schofield, L.S., Junker, B.W., Taylor, L.J. & Black D.A. (2015). Predictive inference using latent variables with covariates. *Psychometrika 80, 727–747.*

Casabianca, J.M. & Junker, B.W. (2013). Estimating the latent trait distribution with loglinear smoothing models. pp. 415–425 in Millsap, R. E., Van der Ark, L. A., Bolt, D. M., & Woods, C. M. (eds.) (2016). *New Developments in Quantitative Psychology.* Springer-Verlag New York.

Sweet, T. M., Thomas, A. C., and Junker, B. W. (2013) Hierarchical network models for education research: hierarchical latent space models. *Journal of Educational and Behavioral Research, 33,* 295–318.

Junker, B. W., Schofield, L. S., and Taylor, L. (2012). The use of cognitive ability measures as explanatory variables in regression analysis. *IZA Journal of Labor Economics*, 1:4. http://www.izajole.com/content/1/1/4

Kaufman, J., Karam, R., Pane, J. & Junker, B. (2012). How curriculum and classroom achievement predict teacher time on lecture- and inquiry-based mathematics activities. In press, *The Journal of Mathematics Education at Teachers College*, special issue on Equity.

Yang, Y.-M., Small, M. J., Junker, B. W., Bromhap, G. S., Wells, A. (2011). Bayesian hierarchical models for soil CO_2 flux and leak detection at geologic sequestration sites. *Environmental Earth Sciences, 64(3),* 787–798.

Matsumura, L.C., Garnier, H.E., Correnti, R., Junker, B., & Bickel, D.D. (2010). Investigating the effectiveness of a comprehensive literacy coaching program in schools with high teacher mobility. *Elementary School Journal, 111 (1),* 35–62.

Ayers, E. & Junker, B. W. (2008). IRT modeling of tutor performance to predict end-of-year exam scores. *Educational and Psychological Measurement, 68,* 972–987.

Cen, H., Koedinger, K., & Junker, B. (2008). Comparing two IRT models for conjunctive skills. In —em International Conference on Intelligent Tutoring Systems (pp. 796-798). Springer, Berlin, Heidelberg.

Cen, H., Koedinger, K. R., & Junker, B. (2007). Is Over Practice Necessary?-Improving Learning Efficiency with the Cognitive Tutor through Educational Data Mining. *Frontiers in artificial intelligence and applications, 158,* 511.

Mariano, L. T. and Junker, B. W. (2007). Covariates of the rating process in hierarchical models for multiple ratings of test items. *Journal of Educational and Behavioral Statistics, 32,* 287–314.

Cen, H., Koedinger, K., & Junker, B. (2006). Learning factors analysis—a general method for cognitive model evaluation and improvement. In *International Conference on Intelligent Tutoring Systems* (pp. 164-175). Springer, Berlin, Heidelberg.

American Statistical Association (2006). *Using Statistics Effectively in Mathematics Education Research.* Final report of the Working Group on Statistics in Mathematics Education Research (Richard Scheaffer, Chair; Martha Aliaga, Marie Diener-West, Joan Garfield, Traci Higgins, Sterling Hilton, Gerunda Hughes, Brian Junker, Henry Kepner, Jeremy Kilpatrick, Richard Lehrer, Frank K. Lester, Ingram Olkin, Dennis Pearl, Alan Schoenfeld, Juliet Shaffer, Edward Silver, William Smith, F. Michael Speed, and Patrick Thompson). Alexandria, VA: Author. Available online at `http://www.amstat.org/research_grants/pdfs/SMERReport.pdf`.

Sijtsma, K. and Junker, B. W. (2006). Item response theory: past performance, present developments, and future expectations. *Behaviormetrika, 33,* 75–102.

Johnson, M. S. and Junker, B. W. (2003). Using data augmentation and Markov chain Monte Carlo for the estimation of unfolding response models. *Journal of Educational and Behavioral Statistics, 28,* 195–230.

Mostow, J., Aist, G. , Burkhead, P., Corbett, A., Cuneo, A., Eitelman, S., Huang, C., Junker. B., Sklar, M.B., and Tobin, B. (2003). Evaluation of an automated Reading Tutor that listens: Comparison to human tutoring and classroom instruction. *Journal of Educational Computing Research, 29,* 61–117. Preprint at `http://www.cs.cmu.edu/~listen/pubs.html`.

Erosheva, E. A., Fienberg, S. E. and Junker, B. W. (2002). Alternative statistical models and representations for large sparse multi-dimensional contingency tables. *Annales de la faculté des sciences de Toulouse Sér. 6, 11 no. 4*, 485–505.

Patz, R. J., Junker, B. W., Johnson, M. S. and Mariano, L. T. (2002). The hierarchical rater model for rated test items and its application to large-scale educational assessment data. *Journal of Educational and Behavioral Statistics, 27,* 341–384.

Junker, B. W. and Sijtsma, K. (2001). Cognitive assessment models with few assumptions, and connections with nonparametric item response theory. *Applied Psychological Measurement, 25,* 258–272.

Junker, B. W. and Sijtsma, K. (2001). Nonparametric item response theory in action: An overview of the special issue. *Applied Psychological Measurement, 25,* 211–220.

Junker, B. W. and Sijtsma, K. (2000). Latent and manifest monotonicity in item response models. *Applied Psychological Measurement, 24,* 65–81.

Fienberg, S. E., Johnson, M. S. and Junker, B. W. (1999). Classical multi-level and Bayesian approaches to population size estimation using multiple lists. Invited paper, special issue on Applications of Random Effects/Multilevel Models to Categorical Data in Social Sciences and Medicine, *Journal of the Royal Statistical Society, Series A, 162,* 383–405.

Patz, R. J. and Junker, B. W. (1999). A straightforward approach to Markov Chain Monte Carlo methods for item response models. *Journal of Educational and Behavioral Statistics, 24,* 146–178.

Patz, R. J. and Junker, B. W. (1999). Applications and extensions of MCMC in IRT: Multiple item types, missing data, and rated responses. *Journal of Educational and Behavioral Statistics, 24,* 342–366.

Junker, B. W. (1998). Some remarks on Scheiblechner's treatment of ISOP models. *Psychometrika, 63,* 73–85.

Ellis, J. L. and Junker, B. W. (1997). Tail-measurability in monotone latent variable models. *Psychometrika, 62,* 495–523.

Hemker, B. T., Sijtsma K., Molenaar, I. W. and Junker, B. W. (1997). Stochastic ordering using the latent trait and the sum score in polytomous IRT models. *Psychometrika*, 62, 331–347.

Huguenard, B. R., Lerch, F. J., Junker, B. W., Patz, R. J. and Kass, R. E. (1997). Working memory failure in phone-based interaction. *ACM Transactions on Computer-Human Interaction, 4,* 67–102.

Junker, B. W. and Bradlow, E. T. (1997). Invited discussion of "Alternatives to GPA-based Evaluation of Student Performance," by Valen E. Johnson. *Statistical Science, 12,* 247–277.

Junker, B. W. and Ellis, J. L. (1997). A characterization of monotone unidimensional latent variable models. *Annals of Statistics, 25,* 1327–1343.

Hemker, B. T., Sijtsma K., Molenaar, I. W. and Junker, B. W. (1996). Polytomous IRT models and monotone likelihood ratio of the total score. *Psychometrika, 61,* 679–693.

Sijtsma, K. and Junker, B. W. (1996). A survey of theory and methods of invariant item ordering. *British Journal of Mathematical and Statistical Psychology, 49,* 79–105.

Junker, B. W. (1995). Review of *Statistical factor analysis and related methods,* Alexander Basilevsky; Wiley (1994). *Applied Psychological Measurement, 18,* 385–388.

Yip, P., Bruno, G., Tajima, N., Seber, G., Buckland, S., Cormack, R., Unwin, N., Fienberg, S. E., Junker, B. W., Chang, Y.-F., LaPorte, R., Libman, I., and McCarty, D. (1995). Mark-recapture and multiple-record systems I. History and theoretical development. *American Journal of Epidemiology, 142,* 1047–1058.

Yip, P., Bruno, G., Tajima, N., Seber, G., Buckland, S., Cormack, R., Unwin, N., Fienberg, S. E., Junker, B. W., Chang, Y.-F., LaPorte, R., Libman, I., and McCarty, D. (1995). Mark-recapture and multiple-record systems II. Applications in human diseases. *American Journal of Epidemiology, 142,* 1059–1068.

Junker, B. W. and Stout, W. F. (1994). Robustness of ability estimation when multiple traits are present with one trait dominant. Chapter 2 in: Laveault, D., Zumbo, B.D., Gessaroli, M.E., & Boss, M.W., Eds. (1994). *Modern Theories of Measurement: Problems and Issues.* Ottawa, Canada: University of Ottawa.

Darroch, J. N., Fienberg, S. E., Glonek, G. F. V. and Junker, B. W. (1993). A three-sample multiple-recapture approach to census population estimation with heterogeneous catchability. *Journal of the American Statistical Association, 88,* 1137–1148.

Junker, B. W. (1993). Conditional association, essential independence and monotone unidimensional item response models. *Annals of Statistics, 21,* 1359–1378.

Miecskowski, T. A., Sweeney, J. A., Haas, G., Junker, B. W., Brown, R. P. and Mann, J. J. (1993). Factor composition of the Suicide Intent Scale. *Suicide and Life Threatening Behavior, 23,* 37–45.

Greenhouse, J. B. and Junker, B. W. (1992). Exploratory statistical methods with applications in psychiatric research. *Psychoneuroendocrinology, 17,* 423–441.

Stout, W. F., Nandakumar, R., Junker, B. W., Chang, H.-H., and Steidinger, D. (1992). DIMTEST: A fortran program for assessing dimensionality of binary item responses. *Applied Psychological Measurement, 16,* 236.

Junker, B. W. (1991). Essential independence and likelihood-based ability estimation for polytomous items. *Psychometrika, 56,* 255–278.

Junker, B. W. (1991). Review of *Stochastic Simulation,* Brian D. Ripley; Wiley (1987). In *Journal of Educational Statistics, 16,* 82–87.

Travers, K. J., Stout, W. F., Swift J. H., Sextro, J. and Junker, B. W. (1988). *Computer Supplement for USING STATISTICS.* (Includes Software.) Addison-Wesley.

Books & Book Chapters

National Academies of Sciences, Engineering, and Medicine. (2017). *Evaluation of the achievement levels for mathematics and reading on the national assessment of educational progress.* Report of the Committee on the Evaluation of NAEP Achievement Levels (Edley, C. Jr., Afflerbach, P., Beckmann, S., Bernard, H.R., Egan, K., Francis, D.J., Goertz, M.E., Hamilton, L., Junker, B., Lane, S., Lewis, S.J., Madison, B.L. Norton, S., Vaughn, S., Wise, L.); Edley, C. Jr. & Koenig, J, eds. National Academies Press.

Casabianca, J. M., Junker, B. W., & Patz, R. J. (2016). Hierarchical Rater Models. Chapter 27 in van der Linden, W. (ed.) *Handbook of Item Response Theory, Volume One: Models.* (pp. 449–465). CRC Press.

Casabianca, J. M., & Junker, B. W. (2016). Discrete Distributions. Chapter 2 in van der Linden, W. (ed.) *Handbook of Item Response Theory, Volume Two: Statistical Tools* (pp. 23–34). Chapman and Hall/CRC.

Casabianca, J. M., & Junker, B. W. (2016). Multivariate Normal Distribution. Chatper 3 in van der Linden, W. (ed.) *Handbook of Item Response Theory, Volume Two: Statistical Tools* (pp. 35–46). Chapman and Hall/CRC.

Junker, B. W., Patz, R. J., & VanHoudnos, N. M. (2016). Markov chain Monte Carlo for item response models. Chapter 15 in van der Linden (ed.) *Handbook of Item Response Theory, Volume Two: Statistical Tools* (pp. 271–325). CRC Press.

Sweet, T. M., Thomas, A. C., and Junker, B. W. (2014). Hierarchical mixed membership stochastic blockmodels for multiple networks and experimental interventions. Invited chapter in: Airoldi, E.M., Blei, D.M., Erosheva, E.A. and Fienberg, S. E. (eds.) *Handbook on Mixed Membership Models,* Boca Raton, FL: Chapman & Hall/CRC.

Haertel, E., Beauregard, R., Confrey, J., Gomez, L., Gong, B., Ho, A.D., Horwitz, P., Junker, B., Pea, R., Rothman, R. & Shepard, L. (2012). *NAEP: Looking ahead. Leading assessment into the future.* National Center for Education Statistics. Initiative on the Future of NAEP. Washington, DC.

Junker, B. W. (2011). The role of nonparametric analysis in assessment modeling: then and now. pp. 67–85 in Dorans, N. & Sinharay, S. (Eds.) *Looking Back: Festschrift in Honor of Paul Holland.* NY: Springer.

Junker, B. W. (2010). Modeling Hierarchy and Dependence among Task Responses in Educational Data Mining. Chapter 9, in Romero, C., Ventura, S., Pechinizkiy, M, & Baker, R. (eds) (2010). *Handbook of Educational Data Mining.* CRC Press.

Junker, B.W. (2007). Using on-line tutoring records to predict end-of-year exam scores: experience with the ASSISTments project and MCAS 8th grade mathematics. In Lissitz, R. W. (Ed.), *Assessing and modeling cognitive development in school: intellectual growth and standard settings.* Maple Grove, MN: JAM Press.

Razzaq, L., Feng, M., Heffernan, N. T. , Koedinger, K. R. , Junker, B. W., Nuzzo-Jones, G., Macasek, M. A., Rasmussen, K. P., Turner, T. E., and Walonoski, J. A. (2007) A Web-based authoring tool for intelligent tutors: Blending assessment and instructional assistance. Pp. 23-49 in Nadia Nedjah, Luiza de Macedo Mourelle, Mario Neto Borges, Nival Nunesde Almeida (Eds.) *Intelligent Educational Machines: Methodologies and Experiences.* Studies in Computational Intelligence, Vol. 44, Springer, NY. ISBN 978-3-540-44920-1. Preprints at `http://www.assistment.org/project`.

Johnson, M. S. and Junker, B. W. (2005). Attitude Scaling. In Everitt, B. and Howell, D. C. (Eds.) *Encyclopedia of Statistics in Behavioral Statistics.* New York: Wiley.

National Research Council (2004):

Advancing Scientific Research in Education. Towne, L. and Wise, L. and Winters, T. (eds.).

Implementating Randomized Field Trials in Education: Report of a Workshop. Towne, L. and Hilton, M. (eds.).

Strengthening Peer Review in Federal Agencies that Support Education Research. Towne, L., Fletcher, J. and Wise, L. (eds.).

Committee on Research in Education. Center for Education, Division of Behavioral and Social Sciences and Education. National Academy Press, Washington, DC.

Junker, B. W. and Gitelman, A. I. (2002). Invited discussion of *Bayesian Analysis of the New York School Choice Scholarships Program* by Barnard, Frangakis, Hill, and Rubin. Fifth Workshop on Bayesian Statistics in Science and Technology, Pittsburgh PA, September 24–25, 1999. Gatsonis, C., Kass, R. E., Carlin, B., Carriquiry, A., Gelman, A., Verdinelli, I., and West, M. (Eds.) (2002). *Case Studies in Bayesian Statistics V*, pp. 73–91. New York: Springer-Verlag.

Junker, B. W. (2001). Factor analysis and latent structure: IRT and Rasch models. In Smelser, N. J. and Baltes, P. B. (Eds.) (2001). *International Encyclopedia of the Social and Behavioral Sciences*. New York: Elsevier-Scientific.

Junker, B. W. (2001). On the interplay between nonparametric and parametric IRT, with some thoughts about the future. In Boomsma, A., Van Duijn, M. A. J. and Snijders, T. A. B. (Eds.) (2001). *Essays on item response theory*, pp. 247–276. New York: Springer-Verlag.

National Research Council (1999). *Embedding Questions: The Pursuit of a Common Measure in Uncommon Tests.* Committee on Embedding Common Test Items in State and District Assessments. Koretz, D. M., Bertenthal, M. W. and Green. B. F. (eds.). Board on Testing and Assessment, Commission on Behavioral and Social Sciences and Education. National Academy Press, Washington, DC.

Fienberg, S. E., Gaynor, M. S. and Junker, B. W. (1997). Discussion of "Modeling Mortality Rates for Elderly Heart Attack Patients: Profiling Hospitals in the Cooperative Cardiovascular Project" by S. T. Normand, M. E. Glickman and T. J. Ryan. pp. 209–227 in Gatsonis, C., Hodges, J., Kass, R., McCullough, R., Rossi, P. and Singpurwalla, N. (eds). (1997). *Case Studies in Bayesian Statistics III* (proceedings of the Third Workshop on Bayesian Statistics in Science and Technology: Case Studies in Economics, Finance, and Business, Pittsburgh, PA. October 5–7, 1995). New York: Springer-Verlag.

Sijtsma, K. and Junker, B. W. (1997). Invariant item ordering of transitive reasoning tasks. In J. Rost and R. Langeheine (Eds.), *Applications of latent trait and latent class models in the social sciences.* (pp. 97–107). Münster/New York: Waxmann Verlag.

Junker, B. W. and Pilkonis, P. A. (1993). Personality and depression: modeling and measurement issues, with commentaries by H. C. Kraemer and R. D. Gibbons. Chapter 3, pp. 133–184 in Klein, M. H., Kupfer, D. J. and Shea, M. T. (eds.), *Personality and Depression: A Current View*. New York: Guilford.

Junker, B. W. and Stout, W. F. (1993). Structural robustness of ability estimates in item response theory. pp. 191–196 in Steyer, R., Wender, K. F. and Widaman, K. F. (eds.), *Psychometric Methodology, Proceedings of the 7th European Meeting of the Psychometric Society in Trier.* Stuttgart and New York: Gustav Fischer Verlag.

Greenhouse, J. B. and Junker, B. W. (1992). "Basic Statistical Principles," Chapter 6 (pp. 149–172) in Hsu, L. K. and Michael Herson, (eds). *Research in Psychiatry: Issues, Strategies and Methods*. New York: Plenum Press.

Selected Conference Papers (write-ups available on request)

Casabianca, J. M., & Junker, B. (2013). *Hierarchical Rater Models for Longitudinal Assessments.* Annual Meeting of the National Council for Measurement in Education. San Francisco, California.

Sweet, T.M. & Junker, B.W. (2013). *Sample Size Calculations for Interventions on Social Networks.* Paper presented by Sweet at the Annual Spring Meeting of the Society for Research on Educational Effectiveness, Washington DC, March 2013.

Casabianca, J. M., & Junker, B. (2012). *Estimating Latent Distributions with Loglinear Smoothing Models.* International Meeting of the Psychometric Society. Lincoln, Nebraska.

Kaufman, J.H., Karam, R., Pane, J. & Junker, B. (2012). *How curriculum and students algebra readiness influence time teachers spend on traditional and reform-oriented mathematics activities.* (Peer-reviewed conference paper.) Society for Research on Educational Effectiveness Spring 2012 Conference, Washington, DC, March 2012.

Sweet, T.M., Thomas, A.C., & Junker, B.W. (2012). *Modeling Intervention Effects on Subgroup Structure Across Social Networks.* Paper presented by Sweet at the Annual Fall Meeting of the Society for Research on Educational Effectiveness, Washington DC, September 2012.

Kaufman, J.H., Junker, B.J. & Stein, M.K. (2011). *Does context affect the accuracy of teachers' survey reports about their reform mathematics instruction?* (Peer-reviewed conference paper.) Society for Research on Educational Effectiveness Fall 2011 Conference, Washington, DC, September 2011.

Sweet, T.M. & Junker, B.W. (2011). *Social network models for educational interventions.* Paper presented at the 2011 International Meeting of the Psychometric Society, Hong Kong.

Cen, H., Koedinger, K., & Junker B. W. (2008). *Comparing Two IRT Models for Conjunctive Skills.* Paper presented at the Ninth Annual Conference on Intelligent Tutoring Systems (ITS2008), Montreal Canada.

Junker, B. W., Resnick, L. B., Matsumura, L. C., Bickel, D., Garnier, H., and Young, K. M. (2008). *Navigating Ethical and Compliance Issues in Developing Causal Conclusions from Randomized Field Trials in Education: A Case Study.* Paper presented 4 March, 2008, at the 2nd Annual Meeting of the Society for Research on Effectiveness in Education, Washington DC.

Anozie, N. and Junker, B. W. (2007). *Investigating the utility of a conjunctive model in Q-matrix assessment using monthly student records in an online tutoring system.* Paper presented at the Annual Meeting of the National Council on Measurement in Education, April 10-12, Chicago IL. Available at `http://www.stat.cmu.edu/~brian/NCME07`.

Cen, H., Koedinger, K. R. and Junker, B. W. (2006). Learning Factors Analysis - A General Method for Cognitive Model Evaluation and Improvement. *Proceedings of the Eighth International Conference on Intelligent Tutoring Systems (ITS2006),* 164–175. Preprints at `http://www.learnlab.org/research/papers.php`.

Anozie, N. O. and Junker, B. W. (2006). Predicting end-of-year accountability assessment scores from monthly student records in an online tutoring system. *Proceedings of the American Association for Artificial Intelligence Workshop on Educational Data Mining (AAAI-06), July 17, 2006, Boston, MA.* Menlo Park, CA: AAAI Press. pp. 1-6. Technical Report WS-06-05. Preprint at `http://www.assistment.org/project`.

Ayers, E. and Junker, B. W. (2006). Do skills combine additively to predict task difficulty in eighth-grade mathematics? *Proceedings of the American Association for Artificial Intelligence Workshop on Educational Data Mining (AAAI-06), July 17, 2006, Boston, MA.* Menlo Park, CA: AAAI Press. pp. 14-20. Technical Report WS-06-05. Preprint at `http://www.assistment.org/project`.

Cen, H., Koedinger, K., and Junker, B. W. (2005). Automating Cognitive Model Improvement by A* Search and Logistic Regression. pp. 47–53, in Beck. J. E. (ed.) *Educational Data Mining: Papers from the 2005 AAAI Workshop.* American Association for Artificial Intelligence, Menlo Park, California. Preprints at `http://www.learnlab.org/research/papers.php`.

Selected Invited Talks

Junker, B.W., (2022). *Data Analysis, Statistics, & Psychometrics.* Invited keynote address, Symposium in Honor of Prof. K. Sijtsma. Universit of Tilberg, the Netherlands. (May 15, 2022).

Junker, B.W., (2016). *The HRM and Other Modern Models for Multiple Ratings of Rich Responses.* Presented as part of the invited symposium "Recent Investigations and Extensions of the Hierarchical Rater Model", organzed by Jodi Casabianca for the Annual Meeting of the National Council on Measurement in Education, Washington DC. (April 11, 2016).

Panel Member, panel of past editors of *Psychometrika* on writing and publication, Annual Meeting of the Psychometric Society, Asheville, NC, July 2016.

Junker, B. W. (October 2014). *Predictive Inference Using Latent Variables with Covariates.* Joint with Dan A. Black (University of Chicago), Lynne Steuerle Schofield (Swarthmore), and Lowell J. Taylor (Carnegie Mellon). Presented to the College Committee on Education, University of Chicago.

Junker, B. W. (June 2013). *Overview of the 2011 Future of NAEP Summit and Report.* Invited presentation, May-June Meeting of the Design & Analysis Committee, National Assessment of Educational Progress, Washington DC.

Junker, B. W. (May 2013). *Educational surveys, plausible values, and Goldilocks.* Invited presentation, Second Annual Workshop on Statistical Methods for Cognitive Assessments, Department of Statistics, Columbia University.

Junker, B. W. (April 2013). *Educational surveys, plausible values, and Goldilocks.* Invited Wherry Lecture, Departments of Statistics and Psychology, Ohio State University.

Junker, B. W. (January 2013). *Bayes, Banjos, Bad Test Scores, and Big Science.* Invited presentation, Sunday Forum, First Unitarian Universalist Church, University of Pittsburgh.

Junker, B. W. (October 2009). *Two nonparametric approaches to cognitive diagnosis modeling.* Invited keynote talk, 25th Workshop on Item Response Theory, Twente University, Enschede, The Netherlands. Oct 12-15, 2009.

Junker, B. W. (July 2009). *Some New Connections for Nonparametric Item Response Modeling.* Invited presidential address, International Meeting of the Psychometric Society, Cambridge England, 23 July 2009.

Junker, B. W. (March 2009). *The Role of Nonparametric Analysis in Assessment Modeling: Then and Now.* Invited seminar, Department of Statistics, University of South Carolina, March 26, 2009.

Junker, B. W. (December 2008). *Ethical and Compliance Issues in Randomized Field Trials in Education: A Case Study.* Invited Seminar Presentation. December 8, 2008. Psychometrics Centre and MRC Biostat Unit, University of Cambridge, England.

Junker, B. W. (September 2008). *The Role of Nonparametric Analysis in Assessment Modeling: Then and Now.* Invited paper. Festschrift Conference for Paul Holland, Sept 19–20, 2008, Educational Testing Service, Princeton NJ.

Junker, B. W. (July 2008). Beyond MCMC (Back to the Future?). Invited "State of the Art" plenary presentation, 2 July 2008. International Meeting of the Psychometric Society (IMPS08), University of New Hampshire, Durham, NH.

Junker, B. W. (June 2008). Assessment modeling in educational data mining. Keynote address, 20 June 2008. 1st Int'l Conference on Educational Data Mining (EDM08), University of Quebec at Montreal, Montreal Canada.

Junker, B. W. (March 2008a). Bayesian item response theory. Invited Seminar, 8 March 2008. Department of Psychology, University of Tokyo, Tokyo Japan.

Junker, B. W. (March 2008b). Ethical and compliance issues in randomized field trials in education: A case study. Invited Colloquium, 10 March 2008. Japan National Center for University Entrance Exams. Tokyo, Japan.

Junker, B. W. (January 2008a). Some issues and applications in cognitive diagnosis and educational data mining. Invited Seminar, 18 January, 2008. Hebb Lecture Series, Department of Psychology, McGill University, Montreal Canada.

Junker, B. W. (January 2008b). What are latent variables made of? Invited Colloquium, 18 January, 2008. Hebb Lecture Series, Department of Psychology, McGill University, Montreal Canada.

Junker, B. W. (July 2007). Some issues and applications in cognitive diagnosis and educational data mining. Invited Plenary Session. International Meeting of the Psychometric Society 2007 (IMPS2007), Tokyo, Japan.

Junker, B. W. (October 2007). Some issues and applications in cognitive diagnosis and educational data mining. Invited talk, Educational Testing Service, Princeton NJ.

Junker, B. W. (April 2007). Uncertainty, prediction, and teacher feedback using an online system that teaches as it assesses. Part of the invited symposium "On-Demand Learning-Embedded Benchmark Assessment Using Classroom-Accessible Technology". (All papers available at `http://www.stat.cmu.edu/~brian/NCME07`.) Annual Meeting of the National Council on Measurement in Education, Chicago IL.

Junker, B. W. (October 2006). Using on-line tutoring records to predict end-of-year exam scores: experience with the ASSISTments project and MCAS 8th grade mathematics. Presented at the 2006 MSDE/MARCES Invitational Conference, University of Maryland. Robert Lissitz, Organizer.

Slater, S. C., Matsumura, L. C., and Junker B. W. (2005). *Generalizability of a Performance Measure of Instructional Quality.* Presented at the Annual Meeting of the National Council on Measurement in Education, Montreal, April 2005.

Junker, B. W., Clare Matsumura, L., Crosson, A., Wolf, M. K., Levison, A., Weisberg, Y. and Resnick, L. (2004). *Overview of the Instructional Quality Assessment.* Presented at a Symposium on the Principles of Learning in Action: Development of the Instructional Quality Assessment (IQA) Toolkit, organized by Clare Matsumura, L. (University of Pittsburgh) for the Annual Meeting of the American Educational Research Association, April 2004, San Diego, CA. See `http://www.stat.cmu.edu/~brian/AERA04`.

Junker, B. W. (2003). *IRT components of a larger psychometric modeling toolkit.* Invited talk, International Meeting of the Psychometric Society, Chia, Sardinia (Italy). July 2003. (Also given at the Bilateral Workshop on Psychometrics in Belgium and Chile, Leuven, Belgium. July 2003.)

Selected Contributed Talks (write-ups available on request)

Sweet, T.M. & Junker, B.W. (July 2011). Social Network Models for Educational Interventions. Presented at the International Meeting of the Psychometric Society. July 20, 2011, Hong Kong.

Junker, B. W. and Mariano, L. T. (April 2001). *Developments in the Hierarchical Rater Model.* Presentation at the Annual Meeting of the National Council of Measurement in Education, April 2001, Seattle, WA.

Baxter, G. and Junker, B. W. (April 2001). *Designing Developmental Assessments: A Case Study in Proportional Reasoning.* Presentation at the Annual Meeting of the National Council of Measurement in Education, April 2001, Seattle, WA.

Professional Organizations

- American Statistical Association (ASA)
- Institute of Mathematical Statistics (IMS)
- Psychometric Society
- American Educational Research Association (AERA)

Professional Activities

Member, Technical Advisory Board, Duolingo English Test. Jan 2021–present.

Member, Technical Advisory Committee, Law School Admissions Council, Jan 2020–present.

Co-chair, Design and Analysis Committee, National Assessment of Educational Progress. 2007–present.

Member, Design and Analysis Committee, National Assessment of Educational Progress. 2002–present.

Member, National Academy of Science Committee on the Evaluation of NAEP Achievement Levels. January 2015–October 2016.

Member, Standing Review Panel, Methodology, Measurement and Statistics (MMS) Program, National Science Foundation. 2009–2011.

Member, Standing Statistics/Modeling Review Panel, Institute of Educational Sciences, U.S. Department of Education. 2006–2009.

Member, Technical Visiting Committee, Educational Testing Service, 2005–2011.

Member, Committee on the Future of NAEP, a whitepaper committe commissioned by the National Center for Education Statistics, US Department of Education. Fall 2011–Fall 2012.

Editor, *Psychometrika*, June 2003–June 2007. (Returned as Interim Editor June 2014–Nov 2014).

Associate editor, *Psychometrika*, 1998–2011 (except for years as Editor).

Associate editor, *Measurement: Interdisciplinary Researh and Perspectives*, 2002–present.

Elected Member, Editorial Board, Psychometric Society, 2000–2006.

Elected Member, Board of Trustees, Psychometric Society, 2000–2003.

Guest Co-Editor, *Applied Psychological Measurement* (with Klaas Sijtsma). Special issue on "Non-parametric Item Response Models in Action", September 2001.

Member, Management Committee of the *Journal of Computational and Graphical Statistics*, 1999–2001.

Referee for a variety of journals and organizations, including: *AERA* and *NCME* (contributed papers)*; Annals of Statistics; Applied Psychological Measurement; Behavioral Research, Methods, Instruments and Computers; Educational Assessment; Journal of the American Statistical Association; Journal of Computational and Graphical Statistics; Journal of Educational and Behavioral Statistics; Journal of Educational Measurement; National Science Foundation* (research proposals, DMS and MMS)*; Psychological Methods; Psychometrika.*

Review Coordinator, "Improving Evaluation of Anti-Crime Programs", Committee on Law and Justice, Division of Behavioral and Social Sciences and Education, National Research Council. November 2004-February 2005.

Steering Committee Member, Workshop Series on Developing Guidelines for Scientific Research in Education and a K-16 Statistics Curriculum. NSF Grant #REC-04-31525 awarded to William Smith (PI) and Richard Scheaffer (Co-PI), American Statistical Association. September 2004–August 2006.

Member, Committee on Research in Education. Center for Education, Division of Behavioral and Social Sciences and Education. National Academy Press, Washington, DC. Lauress L. Wise, Chair. June 2003–December 2005.

Reviewer (Workshop Report on Marketbasket Reporting). Board on Testing and Assessment, Commission on Behavioral and Social Sciences and Education, National Research Council, Washington DC. March 2000.

Member, Committee on Embedding Common Test Items in State and District Assessments. Board on Testing and Assessment, Commission on Behavioral and Social Sciences and Education, National Research Council, Washington DC. D. M. Koretz, Chair. March 1999—August 1999.

Department and University Service

Member, Working group on Diversity, Equity and Inclusion. Department of Statistics & Data Science, January 2022–present.

Chair, Admissions Committee, Masters in Statistical Practice Program, Department of Statistics and Data Science, Carnegie Mellon University, AY 2021–2022.

Faculty mentor for junior faculty Alex Reinhart & Nynke Niezink, Jan 2021–July 2023.

Member, Academic Programs Committee, Department of Statistics & Data Science, Carnegie Mellon University, August 2020–July 2021.

Associate Director for Administration, Masters in Statistical Practice Program, Department of Statistics & Data Science, Carnegie Mellon University, May 2020–June 2021.

Ad hoc representative from Dietrich College of Humanities and Social Sciences to the President's Committee on International Engagements, Carnegie Mellon University. March 2019–Jan 2020.

Ad hoc representative from Dietrich College of Humanities and Social Sciences to the Associate Deans for Research Committee, University Research Council and Research, Innovation & Enterpreneurship Committee, Carnegie Mellon University. December 2018–August 2019.

Member, Committee on general education curriculum assessment, Dietrich College of Humanities and Social Sciences, Carnegie Mellon University. Spring 2017–July 2019.

Associate Dean for Academic Affairs, Dietrich College of Humanities and Social Sciences, Carnegie Mellon University. August 2012–July 2019.

Ad hoc representative from Dietrich College of Humanities and Social Sciences, Committee of Associate Deans for Graduate Policy, Carnegie Mellon University. Spring 2011.

Member, Faculty Senate Budget and Finance Committee, Carnegie Mellon University. Fall 2011–Fall 2014.

Member, Undergraduate Curriculum and Advising Committee, August 2010–Aug 2012. Department of Statistics, Carnegie Mellon University.

Co-Chair, University Assessment Task Force (with Susan Ambrose), October 2007–October 2010. 15-member campus-wide committee to examine the current state of assessment practices on campus, determine obstacles and enablers of productive assessment practices, and make recommendations for the future.

Member, Assessment subgroup of the committee organizing materials for the current Middle States Accreditation process for Carnegie Mellon University, Sept 2006–Sept 2008.

Member, Committee on assessing the effectiveness of undergraduate advising, College of Humanities and Social Sciences, Carnegie Mellon University. October 2006–December 2006.

Chair of the Humanities and Social Sciences Faculty, Carnegie Mellon University, Fall 2005–Spring 2006.

Member, Faculty Search Committee, Department of Statistics, CMU, 2004–2005.

Chair, Faculty Search Committee, Department of Statistics, CMU, 2000–2002, 2003–2004.

Associate Head and Director of Undergraduate Studies, Department of Statistics, CMU, 1997–1999, and 2002–2003.

Editor for update of *Graduate Studies in Statistics*, informational brochure for prospective graduate students of Statistics at CMU. Update included World Wide Web pages, and introduction of a smaller 8-panel flyer for overseas applicants. June 1996 – June 1997.

Director of Graduate Studies, Department of Statistics, CMU, 1995–1997.

Developed, organized and produced two-day orientation for new graduate students in Statistics (Fall 1995, Fall 1996).

Developed and organized summer training in Mathematics for Statistics graduate students (Summer 1995, Summer 1996).

Member, Graduate Admissions Committee, Department of Statistics, CMU, 1994–1996.

Member, Faculty Senate, CMU, 1993–1995.

Chair, M.S. qualifying exam committees (Data Analysis, 1994, 1998; Theory, 1995, 1996, 1997), Department of Statistics, CMU.

Member, Ph.D. written prelim committees (Probability, 1992; Statistics, 1993), Department of Statistics, CMU.

Seminar Coordinator, Department of Statistics, CMU, 1992–1993.

Advising and Mentoring

PhD committee member (Rebecca Nugent & Nynke Niezink, co-chairs) for Xiaoyi Yang. Learning a social network from text data. Defended July 2021.

PhD Co-advisor (with Anjali Mazumder, Alan Turing Institute, London) for Amanda Luby, December 2016–July 2019. Accounting for Individual Differences among Decision-Makers with Applications in Forensic Evidence Evaluation. Defended July 2019.

PhD committee member (Alessandro Rinaldo, chair) for Nicolas Kim. Local structure-detection algorithms for large networks. Defended Summer 2018.

PhD committee member (Karen Clay [Heinz] & Dennis Epple [Tepper], co-chairs) for Thomas Goldring. Essays in the Economics of Education. Defended Spring 2018.

PhD Thesis Advisor for Samrachana Adhikari, Fall 2014–Summer 2016. Latent Space Modeling Approach for Temporal Networks. Defended Summer 2016.

PhD Thesis Advisor for Beau Dabbs, Fall 2014–Summer 2016. Goodness of Fit and Model Selection in Social Networks. Defended Summer 2016.

PhD Committee Member for Xiaolin Yang, 2013–2015. Social Network Modeling and the Evaluation of Structural Similarity for Community Detection. Defended February 2015.

PhD Thesis Advisor for Tracy Sweet, Fall 2010–Summer 2012. Social network analysis in Education Research. Predoctoral fellow in the Program for Interdisciplinary Educational Research (PIER), Carnegie Mellon University. Defended Summer 2012.

PhD Thesis Advisor for Casey Studer, Spring 2009–Summer 2012. Thesis topic: comparing models for learning over time from psychomtrics and cognitive diagnosis. Predoctoral fellow in the Program for Interdisciplinary Educational Research (PIER), Carnegie Mellon University. Defended Summer 2012.

PhD Thesis Advisor for Elizabeth A. Ayers, September 2006–Sepember 2009. Thesis topic: expanding IRT models to accomodate cognitive information about tasks and student performance in an on-line tutoring system. Predoctoral fellow in the Program for Interdisciplinary Educational Research (PIER), Carnegie Mellon University. Defended August 2009

PhD Thesis Advisor (with Lowell Taylor, Heinz School of Urban and Public Policy, Carnegie Mellon) for Lynne (Steuerle) Schofield, November 2005–July 2008. Thesis topic: Using cognitive scores in social policy regression analyses. Defended July 2008.

PhD Thesis Advisor for Marianne H. Bertolet, September 2003–July 2008. Thesis topic: combining mixed effects models and sampling weights in the analysis of complex surveys. Defended July 2008.

PhD Thesis Advisor for Lou Mariano, May 2000–August 2002. Thesis title: "Information accumulation, model selection and rater behavior in constructed response student assessments". Ph.D. dissertation, Department of Statistics, Carnegie Mellon University. Supported as *Educational Testing Service Gulliksen Award* predoctoral fellow for dissertation work in educational research, June 2001–June 2002. Defended Summer 2002. Winner, 2003 *Savage Award* for best dissertation on Applications Methodology in Bayesian Statistics.

PhD Thesis Advisor for Matthew Johnson, May 1999–August 2000. Thesis title: "Parametric and non-parametric extensions to unfolding response models." Supported as *Educational Testing Service Gulliksen Award* predoctoral fellow for dissertation work in educational research, June 1999–June 2000. Defended Spring 2001.

PhD Thesis Advisor for Alix I. Gitelman, March 1997–August 1999. Thesis title: "Accounting for treatment fidelity in studies to compare educational interventions". Supported as a *Spencer Foundation* predoctoral fellow for dissertation work in educational research, June 1998–June 1999. Defended August 1999.

PhD Thesis Advisor for Richard J. Patz (defended June 1996, CMU Statistics). Thesis title: "Markov chain Monte Carlo methods for item response models with applications for the National Assessment of Educational Progress." Supported by ONR AASERT program for graduate training in statistics and psychological measurement, 1992–1995; *Spencer Foundation* predoctoral fellow for dissertation work in educational research, June 1995–June 1996.

PhD Committee member for Nathan Vanhoudnos (Statistics; Chair: Joel Greenhouse.) Fall 2012–Summer 2014. "A Bayesian analysis of a design effecs correction of Hedges, and its consequences for evaluating the utility of quantitative education research." Defended Summer 2014.

PhD Committee member for Xiaolin Yang (Statistics; Chair: Stephen Fienberg.) Fall 2012–Summer 2014. "Geometric and computaional aspects of exponential random graph models." Defended Summer 2014.

PhD Committee Member for April Galyardt (Statistics; Chair: Steve Fienberg.) Summer 2009–Summer 2012. "Mixed Membership Models in Education Reearch". Predoctoral fellow in the

Program for Interdisciplinary Educational Research (PIER), Carnegie Mellon University. Defended Summer 2012.

PhD Committee Member for Daniel Manrique (Statistics; Chair: Steve Fienberg.) December 2008–August 2010. "Longitudinal Mixed Membership Models With Applications". Defended August 2010.

PhD Committee Member for Hao Cen (Machine Learning, Carnegie Mellon; Chair: Ken Koedinger), September 2005–May 2009. Thesis topic: Generalized Learning Factors Analysis: Improving Cognitive Models with Machine Learning. Defended May 2009.

PhD Committee member for Cheryl Ya-Mei Yang (Department of Engineering and Public Policy, Carnegie Mellon University; thesis advisor Michell Small), 2006–2010. Thesis topic: Statistical tools for detecting CO2 leakage from land sequestration sites. Defended December 2010.

PhD Committee member for Sally Jianhua Xu (Department of Engineering and Public Policy, Carnegie Mellon University; thesis advisor Paul Fischbeck), September 2006–December 2007. Thesis topic: Applying Bayesian analysis to inform sensor design, placement, and response protocol for environmental contaminants monitoring in municipal water delivery systems. Defended December 2007.

PhD Committee Member for Rhiannon L. Weaver (Statistics; Chair: Jay Kadane), Summer 2003–Spring 2012. Thesis topic: Bayesian multiple-recapture census estimation methods applied to assessing the threat of internet viruses. Defended Spring 2012.

PhD Committee member for Ernesto San Martin (defended February 25, 2000, Institut de Statistique, Université catholique de Louvain la Neuve, Belgium; thesis advisor Michel Mouchart). Thesis title: "Latent structural models: specification and identification problems". Recipient, *grande distinction avec les felicitations du jury*.

PhD Committee member for Bas Hemker (defended September 1996, Faculty of Social Sciences, University of Utrecht, the Netherlands; thesis advisor Klaas Sijtsma). Thesis title: "Unidimensional IRT models for polytomous items, with results for Mokken scale analysis." Recipient of *cum laude* designation.

PhD Committee member for Petros Hadjicostas (defended August 1995, Statistics, CMU; thesis advisor J. B. Kadane). Thesis title: "Probabilistic analysis of association reversal phenomena."

PhD Committee member for Jules Ellis (defended November 1994, Institute for Cognition and Information, Nijmegen, the Netherlands; thesis advisor Eddy Roskam). Thesis title: "Foundations of latent variable models." Recipient of *cum laude* designation, and co-winner, *1995 Psychometric Society Dissertation Award*.