

Bradley A. Hanson

CTB/McGraw–Hill
20 Ryan Ranch Road
Monterey, CA 93940
(831) 393-6887
E-mail: bhanson@ctb.com

Home:
441 Dela Vina Ave.
Monterey, CA 93940
E-mail: bradh@pobox.com
Home page: <http://www.b-a-h.com/>

Degrees

Ph.D. in Mathematical Methods in Educational Research, June 1986, Stanford University.

M.S. in Statistics, June 1984, Stanford University.

M.Ed. in Educational Psychology, May 1982, Arizona State University.

B.S. in Psychology, December 1978, Arizona State University.

Experience

Chief Research Scientist. Chief Research Scientist at CTB/McGraw–Hill July, 2001 to present. Manage Psychometric Research and Development team. Provide psychometric support for several testing programs and special projects. Conduct research on measurement and psychometric issues, and prepare papers for presentation at professional meetings and for publication.

Psychometrician. Psychometrician in the Measurement Research Department at ACT, Inc.: Psychometrician I — August, 1985 to August, 1989; Psychometrician II — September, 1989 to January, 1997; Principal Psychometrician — February, 1997 to June, 2001. Responsible for equating and general psychometric support for several testing programs and special projects. Designed and implemented a variety of specialized psychometric and statistical procedures including those used for developing score scales, equating, and investigating allegations of cheating. Designed and developed a number of computer programs for specialized statistical and psychometric analyses. Consulted with ACT staff on psychometric and statistical issues. Conducted research on measurement and psychometric issues and prepared papers for presentation at professional meetings and for publication. Served on two corporate-wide groups concerned with computer issues: the Corporate Software Committee, and the Web Page Advisory Group.

Consultant. Performed equating analyses of state tests for the Kentucky Department of Education — August, 1997 to December, 1998. Participated in phase I evaluation of Voluntary National Tests by the National Research Council — April, 1998. Wrote Voluntary National Tests pilot test design evaluation for AIR — May, 1999. Consulted on equating issues and setup computer system to perform equating for the American Board of Orthodontics — July, 1999. Performed check of equating analyses for New Jersey HSPT and GEPA tests — May, 2000 and May, 2001.

Statistical Consultant. October, 1982 to June, 1985. Statistical consultant for the School of Education at Stanford University. Consulted with doctoral students in education on statistical and measurement issues and problems in their research: helped in choosing appropriate statistical and data analysis techniques, explained statistical and measurement concepts and techniques, reviewed research designs and data analysis techniques used, reviewed research reports for clarity and accuracy, helped in use of computer facilities and statistical packages.

Research Assistant. June, 1982 to June, 1985. Worked with Professor V. Srinivasan of the Graduate School of Business at Stanford on the MBE Admissions Research Project, which had the goal of developing statistical models to predict applicants' academic performance in the MBA program and managerial performance after graduation. Helped to plan and carry out analyses of data. Co-author of project research report.

Research Assistant. October, 1983 to December, 1983. Worked with Professor Tom Harrell of the Graduate School of Business at Stanford on a longitudinal study of careers of Stanford MBAs. Designed and carried out data analyses. Co-author of project research report.

Teaching Assistant. April, 1982 to August, 1982. Teaching assistant for two courses in the School of Education at Stanford: an advanced course on factor analysis; a second course in statistics for education students.

Statistical Consultant. August, 1980 to March, 1982. Statistical consultant for the College of Education at Arizona State University. Consulted with faculty and students on statistical, measurement, and computer issues and problems related to their research, analyzed faculty data, and evaluated new statistical programs.

Research Assistant. August, 1979 to August, 1980. Worked with Professor Bonnie Meyer of the College of Education at Arizona State University on a project studying prose learning across the human life-span. Helped to analyze data, and conducted text analysis of subject recall of prose passages using the Meyer text analysis system.

Publications

Hanson, B. A. & Béguin, A. A. (in press). Obtaining a common scale for IRT item parameters using separate versus concurrent estimation in the common item nonequivalent groups equating design. *Applied Psychological Measurement*.

Tsai, T., Hanson, B. A., Kolen, M. J., & Forsyth, R. A. (2001). A comparison of bootstrap standard errors of IRT equating methods for the common-item nonequivalent groups design. *Applied Measurement in Education*, 14, 17-30.

Wang, T., Hanson, B. A., & Harris, D. J. (2000). The effectiveness of circular equating as a criterion for evaluating equating. *Applied Psychological Measurement*, 24, 195-210.

Pommerich, M., Nicewander, W. A., & Hanson, B. A. (1999). Estimating average domain scores. *Journal of Educational Measurement*, 36, 199-216.

Wang, T., Hanson, B. A., & Lau, C. A. (1999). Reducing bias in CAT ability estimation: A comparison of approaches. *Applied Psychological Measurement*, 23, 263-278.

- Hanson, B. A. (1998). Uniform DIF and DIF defined by differences in item response functions. *Journal of Educational and Behavioral Statistics, 23*, 244-253.
- Hanson, B. A. (1998). [Review of the book *Latent class and discrete latent trait models* by T. Heinen]. *Journal of Educational Measurement, 35*, 175-178.
- Hanson, B. A. (1996). Testing for differences in test score distributions using loglinear models. *Applied Measurement in Education, 9*, 305-321.
- Kolen, M. J., Zeng, L., & Hanson, B. A. (1996). Conditional standard errors of measurement for scale scores using IRT. *Journal of Educational Measurement, 33*, 129-140.
- Zeng, L., Hanson, B. A., & Kolen, M. J. (1994). Standard errors of a chain of linear equatings. *Applied Psychological Measurement, 18*, 369-378.
- Hanson, B. A., Zeng, L., & Kolen, M. J. (1993). Standard errors of Levine linear equating. *Applied Psychological Measurement, 17*, 225-237.
- Kolen, M. J., Hanson, B. A., & Brennan, R. L. (1992). Conditional standard errors of measurement for scale scores. *Journal of Educational Measurement, 29*, 285-307.
- Hanson, B. A. (1991). A comparison of bivariate smoothing methods in common-item equipercentile equating. *Applied Psychological Measurement, 15*, 391-408
- Hanson, B. A. (1991). A note on Levine's formula for equating unequally reliable tests using data from the common item nonequivalent groups design. *Journal of Educational Statistics, 16*, 93-100.
- Hanson, B. A., & Brennan, R. L. (1990). An investigation of classification consistency indexes estimated under alternative strong true score models. *Journal of Educational Measurement, 27*, 345-359.

Research Reports

- Hanson, B. A., Harris, D. J., Pommerich, M., Sconing, J. A., & Yi, Q. (2001). *Suggestions for the evaluation and use of concordance results*. ACT Research Report 2001-1. Iowa City: ACT, Inc.
- Ban, J., Hanson, B. A., Wang, T., Yi, Q., & Harris D. J. (2000). *A comparative study of online pretest item calibration/scaling methods in CAT*. ACT Research Report 2000-11. Iowa City, IA: ACT, Inc.
- Lee, W., Hanson, B. A., & Brennan R. L. (2000). *Procedures for computing classification consistency and accuracy indices with multiple categories*. ACT Research Report 2000-10. Iowa City, IA: ACT, Inc.
- Pommerich, M., Hanson, B. A., Harris, D. J., & Sconing J. (2000). *Issues in creating and reporting concordance results based on equipercentile methods*. ACT Research Report 2000-1. Iowa City, IA: ACT, Inc.

- Hanson, B. A., & Béguin, A. A. (1999). *Separate versus concurrent estimation of IRT item parameters in the common item equating design*. ACT Research Report 99-8. Iowa City, IA: ACT, Inc.
- Wang, T., Hanson, B. A., & Harris D. J. (1998). *The effectiveness of circular equating as a criterion for evaluating equating*. ACT Research Report 98-6. Iowa City, IA: ACT, Inc.
- Hanson, B. A., & Feinstein, Z. S. (1997). *Application of a polynomial loglinear model to assessing differential item functioning for common items in the common-item equating design*. ACT Research Report 97-1. Iowa City, IA: ACT, Inc.
- Woodruff, D. J., & Hanson, B. A. (1996). *Estimation of item response models using the EM algorithm for finite mixtures*. ACT Research Report 96-6. Iowa City, IA: ACT, Inc.
- Hanson, B. A., Zeng, L., & Colton, D. (1994). *A comparison of presmoothing and postsmoothing methods in equipercentile equating*. ACT Research Report 94-4. Iowa City, IA: ACT, Inc.
- Hanson, B. A. (1991). *Method of moments estimates for the four-parameter beta compound binomial model and the calculation of classification consistency indexes*. ACT Research Report 91-5. Iowa City, IA: ACT, Inc.
- Hanson, B. A. (1990). *An investigation of methods for improving estimation of test score distributions*. ACT Research Report 90-4. Iowa City, IA: ACT, Inc.
- Hanson, B. A. (1989). Scaling the P-ACT+. In R. L. Brennan (Ed.), *Methodology used in scaling the ACT Assessment and P-ACT+*. Iowa City, IA: ACT, Inc.
- Kolen, M. J., & Hanson, B. A. (1989). Scaling the ACT Assessment. In R. L. Brennan (Ed.), *Methodology used in scaling the ACT Assessment and P-ACT+*. Iowa City, IA: ACT, Inc.
- Hanson, B. A., Harris, D. J., & Brennan, R. L. (1987). *A comparison of several statistical methods for examining allegations of copying*. ACT Research Report 87-15. Iowa City, IA: ACT, Inc.
- Brennan, R. L., Harris, D. J., & Hanson, B. A. (1987). *The bootstrap and other procedures for examining the variability of estimated variance components in testing contexts*. ACT Research Report 87-7. Iowa City: ACT, Inc.

Conference Papers

- Ban, J. Hanson, B. A., Yi, Q., & Harris, D. J. (2001). *Data sparseness and online pretest item calibration/scaling methods in CAT*. Paper presented at the Annual Meeting of the American Educational Research Association (Seattle, April).
- Béguin, A. A., & Hanson, B. A. (2001). *Effect of noncompensatory multidimensionality on separate and concurrent estimation in IRT observed score equating*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (Seattle, April).
- Chang, S., Hanson, B. A., & Harris, D. J. (2001). *A comparison of the standardization and IRT methods of adjusting pretest item statistics using realistic data*. Paper presented at the Annual Meeting of the American Educational Research Association (Seattle, April).

- Wang, T., & Hanson, B. A. (2001). *Development and calibration of an item response model that incorporates response time*. Paper presented at the Annual Meeting of the American Educational Research Association (Seattle, April).
- Yi, Q., Hanson, B. A., Widiatmo, H., & Harris, D. J. (2001). *Comparison of the SPRT and CMT procedures in computerized classification tests*. Paper presented at the Annual Meeting of the American Educational Research Association (Seattle, April).
- Yi, Q., Widiatmo, H., Hanson, B. A., Ban, J., & Harris, D. J. (2001). *Impact of scoring options for not reached items in CAT*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (Seattle, April).
- Ban, J., Hanson, B. A., Wang, T., Yi, Q., & Harris, D. J. (2000). *A comparative study of online pretest item calibration/scaling methods in CAT*. Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, April).
- Béguin, A. A., Hanson, B. A. & Glas, C. A. W. (2000). *Effect of multidimensionality on separate and concurrent estimation in IRT equating*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (New Orleans, April).
- Chang, S., Hanson, B. A., & Harris, D. J. (2000). *A standardization approach to adjusting pretest item statistics*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (New Orleans, April).
- Gao, X., Hanson, B. A., & Harris, D. J. (2000). *Examining effects of examinee group and form similarity on equating relationships*. Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, April).
- Harris, D. J., Hanson B. A., & Gao, X. (2000). *A comparison of generalizability theory and IRT methodology in estimating domain scores*. Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, April).
- Kim, J., & Hanson, B. A. (2000). *Test equating under the multiple choice model*. Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, April).
- Lee, W., Hanson, B. A., & Brennan R. L. (2000). *Procedures for computing classification consistency and accuracy indices with multiple categories*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (New Orleans, April).
- Yi, Q., Hanson, B. A., Widiatmo, H., & Harris, D. J. (2000). *Procedures for screening for "affected" common items in common-item nonequivalent groups design*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (New Orleans, April).
- Widiatmo, H., & Hanson, B. A. (2000). *Describing a procedure for computing the standard error of equating of a composite score using the bootstrap*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (New Orleans, April).

- Hanson, B. A. & Béguin, A. A. (1999). *Obtaining a common scale for IRT item parameters using separate versus concurrent estimation in the common item nonequivalent groups equating design*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (Montreal, April).
- Hanson, B. A. & Bay L. G. (1999). *Classifying student performance as a method for setting achievement levels for NAEP*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (Montreal, April).
- Hanson, B. A., Harris, D. J., Pommerich, M., Sconing, J. A., & Yi, Q. (1999). *Suggestions for the evaluation and use of concordance results*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (Montreal, April).
- Pommerich, M., Hanson, B. A., Harris, D. J, & Sconing, J. A. (1999). *Issues in creating and reporting concordance results based on equipercentile methods*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (Montreal, April).
- Gao, X., Hanson, B. A., & Harris, D. J. (1999). *Effect of using different common item sets under the common item non-equivalent groups design*. Paper presented at the Annual Meeting of the American Educational Research Association (Montreal, April).
- Wang, T., Yi, Q., Ban. J., Harris, D. J. & Hanson, B. A. (1999). *Adjusting “scores” from a CAT following successful item challenges*. Paper presented at the Annual Meeting of the American Educational Research Association (Montreal, April).
- Ban. J., Hanson, B. A., & Harris, D. J. (1999). *Effects of equating strains on equating error in the common-item nonequivalent groups design*. Paper presented at the Annual Meeting of the American Educational Research Association (Montreal, April).
- Hanson, B. A. (1998). *Bayes modal estimates of a discrete latent variable distribution in item response models using the EM algorithm*. Paper presented at the Annual Meeting of the American Educational Research Association (San Diego, April).
- Hanson, B. A., Bay, L., & Loomis, S. C. (1998). *Booklet classification study*. Paper presented at the Annual Meeting of the American Educational Research Association (San Diego, April).
- Chen, W., Hanson, B. A. ,& Harris, D. J. (1998). *Scaling and equating mixed item-type composite scores*. Paper presented at the Annual Meeting of the American Educational Research Association (San Diego, April).
- Harris, D. J., Gao, X., & Hanson, B. A. (1998). *Weighing non-representative common item sets with non-equivalent groups equating*. Paper presented at the Annual Meeting of the American Educational Research Association (San Diego, April).
- Wang, T., Hanson, B. A., & Harris, D. J. (1998). *The effectiveness of circular equating as a criterion for evaluating equating and scale drift*. Paper presented at the Annual Meeting of the American Educational Research Association (San Diego, April).

- Wang, T., Lau, C. A., & Hanson, B. A. (1998). *Unbiased Bayesian estimates in computerized adaptive testing*. Paper presented at the Annual Meeting of the American Educational Research Association (San Diego, April).
- Butler, O. D., & Hanson, B. A. (1997). *An examination of presmoothing and postsmoothing methods in equating a direct writing assessment*. Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, March).
- Hanson, B. A., Harris, D. J., & Kolen, M. J. (1997). *A comparison of single- and multiple-linking in equipercentile equating with random groups*. Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, March).
- Hanson, B. A., Wang, T., & Kolen, M. J. (1997). *PLAN/ACT Scale*. Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, March).
- Woodruff, D. & Hanson, B. A. (1997). *Estimation of item response models using the EM algorithm for finite mixtures*. Paper presented at the Annual Meeting of the Psychometric Society (Gatlinburg, Tennessee, June).
- Hanson, B. A., & Feinstein, Z. S. (1995). *A polynomial loglinear model for assessing differential item functioning*. Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, April).
- Hanson, B. A. (1994). *Statistical indexes of response similarity derived from the compound binomial distribution*. Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, April).
- Kolen, M. J., Zeng, L., & Hanson, B. A. (1994). *Conditional standard errors of measurement for scale scores using IRT*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (New Orleans, April).
- Hanson, B. A. (1993). *A missing data approach to adjusting writing sample scores*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (Atlanta, April).
- Hanson, B. A. (1992). *Testing for differences in test score distributions using log-linear models*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (San Francisco, April).
- Harris, D. J., & Hanson, B. A. (1991). *Methods of examining the usefulness of subscores*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (Chicago, April).
- Hanson, B. A., Zeng, L., & Colton, D. (1991). *A comparison of presmoothing and postsmoothing methods in equipercentile equating*. Paper presented at the Annual Meeting of the National Council on Measurement in Education (Chicago, April).
- Hanson, B. A. (1990). *A comparison of bivariate smoothing methods in common-item equipercentile equating*. Paper presented at the Annual Meeting of the American Educational Research Association (Boston, April).

Hanson, B. A., & Brennan, R. L. (1989). *An investigation of classification consistency indices estimated under alternative strong true score models*. Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, April).

Hanson, B. A. (1988). *The use of smoothness assumptions in improving estimation of test score distributions*. Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, April).

Hanson, B. A. (1987). *A comparison of empirical decision rules for differential assignment to alternative curricula*. Paper presented at the Annual Meeting of the American Educational Research Association (Washington, D.C., April).

Hanson, B. A. (1987). *Equating using the congeneric model in the common-item nonequivalent populations design*. Paper presented at the Annual Meeting of the American Educational Research Association (Washington, D.C., April).

Computer Programs

At ACT I designed and developed many computer programs for specialized statistical and psychometric analyses, including programs for: test equating for the random groups and common-item designs, IRT item parameter scaling, maximum likelihood estimation of polynomial log-linear models for univariate and multivariate frequency distributions, maximum likelihood and Bayes modal estimation of item parameters and latent variable distributions in item response models using the EM algorithm, method of moments estimates of the four-parameter beta compound binomial strong true score model for univariate and bivariate frequency distributions, and bootstrap estimates of the standard error of equating. Some of these programs are available from my software web page (<http://www.b-a-h.com/software/>). I am participating in a project to create open source IRT estimation software. This project is hosted at the SourceForge web site (<http://sourceforge.net/projects/ssm>).

Home Page

My home page at <http://www.b-a-h.com/> contains the most recent version of this vita along with copies of some papers and software I have written.

Professional Memberships

American Educational Research Association

National Council on Measurement in Education

Psychometric Society

American Statistical Association

Other Professional Activities

Member, Board of Advisory Editors, *Journal of Educational Measurement*, 1999–2001

Member, Publication Committee of the National Council on Measurement in Education, 1998 – 2000

Chair of National Council on Measurement in Education Ad Hoc Committee on Software Issues
in Educational Measurement, 1999 – 2000

Chair of National Council on Measurement in Education Ad Hoc Web Site Committee, 1998

Reviewer, *Applied Measurement in Education*

Reviewer, *Applied Psychological Measurement*

Reviewer, *Journal of Educational Measurement*

Reviewer, *Journal of Educational and Behavioral Statistics*

Reviewer, *Psychometrika*