

GARY E. SKAGGS, Ph. D.

Associate Professor
Research and Evaluation Program
School of Education
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EDUCATION

B.S. Virginia Polytechnic Institute & State University, 1974, Psychology.
M.S. Radford College, 1975, School Psychology.
Ph.D. University of Maryland, College Park, 1984, Measurement, Statistics, & Evaluation.

EMPLOYMENT

2001-present **Associate Professor, Virginia Polytechnic Institute and State University, School of Education, Research and Evaluation Program.** Tenure-track faculty position. Responsibilities include conducting research, teaching courses in introductory/intermediate research design and statistics, measurement theory, and regression, advising graduate students, and providing service to the School of Education and University.

1991-2001 **President, West Mesa Associates, Inc.,** Hardy, VA. Founded by Dr. Skaggs in 1991 as a sole proprietorship and incorporated in 1995. Independent consultancy, specializing in psychometric and statistical analyses, test development, quantitative software development, and program evaluation.

2000-2001 **Visiting Assistant Professor, Virginia Tech, Dept of Educational Leadership and Policy Analysis.** One year, full-time faculty position in the Research and Evaluation Program. Taught courses in introductory research design and statistics, measurement theory, and regression methods, advised graduate students, and provided service to the department.

1989-1996 **Adjunct Professor, University of Maryland, Dept. of Measurement, Statistics, and Evaluation.** Taught graduate courses on applied measurement theory and statistical methods.

1984-1991 **Test Development Analyst, Office of Research and Evaluation, Fairfax County (VA) Public Schools, Falls Church, VA.** Developed curriculum-referenced tests for system-wide assessment. Conducted related technical projects such as test equating and scaling, test score reporting, analyses of item bias, and program evaluations.

1983-1984 **Statistician, U.S. Bureau of the Census, Department of Commerce, Suitland, Maryland.** Collaborated on the evaluation of computer-assisted

telephone interviewing methods. Developed sampling and data analysis procedures for interviewer monitoring. Prepared research plans for the 1990 Census of Population. Wrote Fortran programs to support research.

1978-1983 **Instructor, Graduate Assistant, Department of Measurement, Statistics, and Evaluation, University of Maryland, College Park.** Taught undergraduate and graduate courses in quantitative research methods. Provided research and instructional assistance to graduate students and faculty.

1976-1978 **School Psychologist, Calvert County (MD) Public Schools, Prince Frederick, Maryland.** Responsibilities included psychological evaluations of students and recommendations for school actions; consultation services for parents, teachers, and administrators; and individual and group counseling.

UNIVERSITY TEACHING EXPERIENCE

EDRE 6684: Instrument Development and Validation Spring 2009 (Virginia Tech). Doctoral course on validity and developing instruments (tests) to measure psychological and educational constructs.

EDRE 6794: Advanced Item Response Theory Fall 2006, 2007 (Virginia Tech). Advanced doctoral course on item response theory.

EDRE 6774: Advanced Issues in Psychometric Research: Equating and Standard Setting Fall 2008 (Virginia Tech). Advanced doctoral course on test equating, scaling, and standard setting.

EDRE 6624: Measurement Theory in Education Fall, 2000, 2001, 2002, 2003, 2004, 2005, Spring, 2007, 2009, Summer, 1989 (Virginia Tech): Doctoral course in theoretical and applied measurement.

EDRE 6634: Advanced Statistics: Regression Spring, 2000, 2001, 2002, 2003, 2004, 2005, 2006, Fall 2005 (Virginia Tech): Doctoral course in regression analysis.

STAT 5634: Statistics for Behavioral Sciences Fall 2003 (Virginia Tech): Graduate course in introductory statistics

EDRE 5644: Survey Research and Questionnaire Design Spring 2003 (Virginia Tech): Graduate course in survey methodology

EDRE 6605-6606: Quantitative Research Methods Fall, 2000, 2001, 2002, 2006, 2007; Spring, 2001, 2002, 2003, 2007 (Virginia Tech) Year-long graduate course in quantitative research methods.

EDMS 645: Quantitative Research Methods I Fall, 1990, 1996 (University of Maryland). First course in introductory research methods and statistics sequence for graduate students.

EDMS 646: Quantitative Research Methods II Spring, Summer 1995 (University of Maryland). Second course in introductory research methods and statistics sequence for graduate students.

EDMS 623: Applied Measurement: Issues and Practices Fall, 1994, Fall, 1991 (University of Maryland). Doctoral level course in theoretical and applied measurement.

EDMS 450: Introduction to Statistics 1982-84: (University of Maryland) Undergraduate/graduate courses in introductory statistics.

PUBLICATIONS IN PEER-REVIEWED JOURNALS

Hein, S., & Skaggs, G. (in press). A qualitative investigation of bookmark standard setting: Participant deviations from the bookmark procedure and difficulties with item ordering. *Applied Measurement in Education*.

Miyazaki, Y., & Skaggs, G. (2008) Linking classical test theory and two-level hierarchical linear models. *Journal of Applied Measurement*, 9(4), 344-356.

Enyeart-Smith, T., Skaggs, G., & Redican, K. (2008). A Comparison of Health Risk Behaviors among College Students Enrolled in a Required Personal Health Course vs. an Elective Personal Health Course. *The Health Educator*, 40(2), 90-97.

Skaggs, G., Hein, S., & Awuor, R. (2007). Setting passing scores on passage-based tests: A comparison of traditional and single-passage bookmark methods. *Applied Measurement in Education*, 20(4), 405-426.

Roberts, P., Getz, H., & Skaggs, G. (2006). Alleviating stress in clergy wives: formative evaluation of a psycho-educational group intervention in its first implementation. *Journal of Spirituality in Mental Health*, 9(1), 35-58.

Skaggs, G. (2007). Bookmark locations and item response model selection in the presence of local item dependence. *Journal of Applied Measurement*, 8(1), 65-83.

Skaggs, G., & Bodenhorn, N. (2006) Relationships between implementing character education, student behavior, and student achievement. *Journal of Advanced Academics*, 18(1), 82-114.

Peterson, B.D., Newton, C.R., Rosen, K.H., & Skaggs, G.E. (2006). How men and women referred with in vitro fertilization cope with infertility stress. *Human Reproduction*, 21, 2443-2449.

Petersen, B. D., Newton, C. R., Rosen, K. H., & Skaggs, G. E. (2006). The relationship between coping and depression in men and women referred for in vitro fertilization. *Fertility and Sterility*, 85(3), 802-804.

Worrell, T., Skaggs, G., & Brown, M. (2006). School Psychologists' Job Satisfaction: A Twenty-two Year Perspective in the USA. *School Psychology International*, 27(2), 131-145.

- Skaggs, G. (2005). Accuracy of random groups equating with very small samples. *Journal of Educational Measurement*, 42(4), 309-330.
- Bodenhorn, N. & Skaggs, G. (2005). Development of the school counselor self-efficacy scale. *Measurement and Evaluation in Counseling and Development*, 38(1), 14-28.
- Hertlein, K. & Skaggs, G. (2005). Assessing the relationship between differentiation and infidelity: A structural equation model. *Journal of Couple and Relationship Therapy*, 4(2/3), 195-213.
- Enyeart-Smith, T., Skaggs, G., Redican, K., Eschenmann, K., Krouscas, J. & Stewart, S. (2005). A comparison of health risk behaviors among Virginia Tech and James Madison University students enrolled in a personal health course. *The Virginia Journal*, 27(2), 27-29.
- Skaggs, G. (Spring, 2004). Software Use in Psychometric Research. *Educational Measurement: Issues and Practices*, 23(1), 28-33.
- Rudner, L.M., Bracey, G, & Skaggs, G. (1996). The use of a person-fit statistic with one high-quality achievement test. *Applied Measurement in Education*, 9, 91-109.
- Skaggs, G. & Lissitz, R. W. (1992). The consistency of detecting item bias across different test administrations: Implications of another failure. *Journal of Educational Measurement*, 29, 227-242.
- Skaggs, G. (1990). To match or not to match samples on ability for equating: A discussion of five articles. *Applied Measurement in Education*, 3, 105-113.
- Skaggs, G. and Stevenson, J. (1989). A comparison of pseudo-Bayesian and joint maximum likelihood procedures for estimating item parameters in the three-parameter IRT model. *Applied Psychological Measurement*, 13, 391-402.
- Skaggs, G. and Lissitz, R.W. (1988). Effect of examinee ability on test equating invariance. *Applied Psychological Measurement*, 12, 69-82.
- Skaggs, G. and Lissitz, R.W. (1986). An exploration of the robustness of four test equating models. *Applied Psychological Measurement*, 10, 303-317.
- Skaggs, G. and Lissitz, R.W. (1986). IRT test equating: Relevant issues and a review of recent research. *Review of Educational Research*, 56, 495-529.

OTHER PUBLICATIONS

- Skaggs, G., & Wolfe, E. W. (in press). Equating designs and procedures used in Rasch scaling. In Smith, Jr., E.V., & Stone, G.E. (Eds.). *Criterion-referenced Testing: Practice analysis to score reporting using Rasch measurement models*. Maple Grove, MN: JAM Press.
- Skaggs, G. (2006). Test equating, scaling, and linking [Book review]. *Applied Psychological Measurement*, 30(6), 511-513.
- Skaggs, G., & Awuor, R. (2006). Software exchange website. National Council on Measurement in Education *Newsletter*, 14(2), 14-15.
- Contributor to Blithell, S. (Summer, 2006). Hot topic: Testing the limits. *Virginia Tech Magazine*, 28(4), 8-9. I was the "featured expert" for this article.
- Skaggs, G. & Kaufman, S. (2000). *Linking the NAEP and SASS Surveys: Methodological Issues and Potential Uses*. Proceedings of the 2000 Joint Statistical Meetings of the American Statistical Association, Indianapolis, IN.
- Rudner, L.M., Skaggs, G., Bracey, G., & Getson, P.R. (1995). *The use of fit statistics in reporting and analyzing of National Assessment of Educational Progress results*. Washington, DC: National Center for Educational Statistics.
- Skaggs, G. (1995). *The feasibility of applying IRT methodology to the Tests of General Educational Development*. (GED Technical Report 95-3). Washington, DC: GED Testing Service.
- Auchter, J.C., Sireci, S.G., & Skaggs, G. (1993). *The Tests of General Educational Development: Technical Manual*. Washington, D.C.: American Council on Education.

PAPERS & PRESENTATIONS

- Skaggs, G. (2009, April). *Facilitating psychometric software exchange*. Paper presented at the Annual Meeting of the National Council on Measurement in Education, San Diego.
- Hein, S. F., & Skaggs, G. (2008). *A Qualitative Investigation of Panelists' Experiences of Standard Setting Using the Single-Passage Bookmark and Yes/No Methods*. Paper presented at the 2008 Annual Meeting of the National Council on Measurement in Education.
- Skaggs, G., & Hein, S. (2007). *A Comparison of the Yes/No and Single-Passage Bookmark Procedures for Standard Setting on a Passage-Based Test*. Paper presented at the Annual Meeting of the National Council on Measurement in Education, Chicago.
- Joseph W. McLaughlin, J. W., & Skaggs, G. (2007). *The Relationship between Test Preparation Activities and GED® Test Performance*. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago.

- Skaggs, G., Hein, S., & Awuor, R. (2006). *A testlet variation of bookmark standard setting procedure*. Paper presented at the Annual Meeting of the National Council on Measurement in Education, San Francisco.
- Peterson, B.D., Newton, C.R., Rosen, K.H., & Skaggs, G. (2005). *How men and women referred for in vitro fertilization cope with infertility stress*. Paper presented at Annual Meeting of the American Society for Reproductive Medicine, Montreal, Canada.
- Skaggs, G. (2004). *Passing score stability when equating with very small samples*. Paper presented at the Annual Meeting of the National Council on Measurement in Education, San Diego.
- George, C.E. & Skaggs, G. (2004). *Examining the validity of test scores with scheduling and setting accommodations*. Paper presented at the Annual Meeting of the National Council on Measurement in Education, San Diego.
- Enyeart-Smith, T., Skaggs, G., Redican, K., Eschenmann, K., Krouscas, J. & Stewart, S. (November 2004). *A comparison of health risk behaviors of students enrolled in a personal health course*. Presented at the Virginia Association of Health, Physical Education, Recreation, and Dance Convention, Reston, VA.
- Skaggs, G. (2002). *Software use in psychometric research*. Paper presented at the Annual Meeting of the National Council on Measurement in Education, New Orleans.
- Skaggs, G. & Tessema, A. (2001). *Item disorderliness with the bookmark standard setting procedure*. Paper presented at the Annual Meeting of the National Council on Measurement in Education, Seattle.
- Tessema, A., Skaggs, G., Schaefer, L., & Auchter, J. (2001). *What impact, if any, does right-scoring method have on classification errors?* Paper presented at the Annual Meeting of the National Council on Measurement in Education, Seattle.
- Auchter, J.E., Skaggs, G., & Stansfield, D. (1998). *Linking tests across two languages: Focus on the screening of biliterate Hispanic U.S. seniors*. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego.
- Skaggs, G. & Bourque, M.L. (1998). *Overview of the most difficult technical issues on the Voluntary National Test*. Paper presented at the Annual Meeting of the National Council on Measurement in Education, San Diego.
- Skaggs, G. & Lissitz, R.L. (1995). *A comparison of strategies for equating single prompt writing assessments*. Paper presented at the Annual Meeting of the National Council on Measurement in Education, San Francisco.
- Auchter, J.C. & Skaggs, G. (1994). *The performance of 1993 graduating high school seniors: How do U.S. high schools measure up?* Paper presented at the Annual Meeting of the National Council on Measurement in Education, New Orleans.

- Rudner, L.M., Skaggs, G., & Bracey, G. (1993). *The use of person fit statistics in the analysis and reporting of NAEP results*. Paper presented at the Annual Meeting of the American Educational Research Association, Atlanta.
- Skaggs, G. (1993). *The feasibility of applying IRT methodology to the Tests of General Educational Development (GED)*. Paper prepared for the GED Testing Service, American Council on Education.
- Skaggs, G. (1990). *Assessing the utility of item response theory models for test equating*. Paper presented at the Annual Meeting of the National Council on Measurement in Education, Boston.
- Skaggs, G., Pike, L.W., and Rajpal, P. (1989). *Comparing the reliabilities of completion and multiple-choice items*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco.
- Skaggs, G. and Lissitz, R.W. (1988). *Consistency of selected item bias indices: implications of another failure*. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans.
- Skaggs, G. and Lissitz, R.W. (1986). *The effect of examinee ability on test equating invariance*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco.
- Skaggs, G. and Stevenson, J. (1986). *A comparison of ASCAL and LOGIST parameter estimation programs*. Paper presented at the Annual Meeting of the National Council on Measurement in Education, San Francisco.
- Burt, C.W., Fitzmartin, R.D., and Skaggs, G. (1986). *Baseline strategies in evaluating IRT item bias indices*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco.
- Skaggs, G. and Lissitz, R.W. (1985). *An exploration of the robustness of four test equating models*. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago.
- Skaggs, G. and Lissitz, R.W. (1982). *Test equating: relevant issues and a review of recent research*. Paper presented at the Annual Meeting of the American Educational Research Association, New York.
- Skaggs, G. and Lissitz, R.W. (1981). *Discriminant and convergent validation of a behavioral tendencies approach to determining job satisfaction*. Paper presented at the Annual Meeting of the National Council on Measurement in Education, Los Angeles.

INVITED PRESENTATIONS

Exploring Item Disordinality with the Bookmark Standard Setting Procedure. Presentation to the assessment program faculty and graduate students at James Madison University, 2003.

Introduction to Item Response Theory Presentation to faculty/students in the Management Department, Pamplin College of Business, Virginia Tech, 2003.

Developing a Certification Program: Is It Valid?. Invited presentation at Certification Knowledge Network, sponsored by the American Society of Association Executives, Washington, DC, 2000.

Skaggs, G. & Lissitz, R. W. (1990). *Equating NAEP with state, local, commercial, or international assessments.* Paper presented to the National Assessment Governing Board, Washington, DC.

AWARDS AND FUNDING

Office of Academic Assessment (February, 2009). *Assessment Education Grant*, PI: Dr. Gary Skaggs. The purpose of this grant is to fund attendance at three training workshops sponsored by the National Council on Measurement in Education prior to their Annual Meeting in April 2009 in San Diego. The workshops focus on cognitive diagnostic models. Amount: \$600

College of Liberal Arts and Human Sciences (March, 2009). *Jerome Niles Dean's Faculty Research Award*, PI: Dr. Gary Skaggs. The purpose of this grant is to support research using cognitive diagnostic models in preparation for an NSF proposal. Amount: \$2,456.

GED Testing Service Research Fellowship (April, 2006): *The Relationship between Test Taking Practices and GED Test Performance.* This competitive fellowship is designed for graduate students wishing to conduct publication-quality research that uses GED Test data. My student, Joseph McLaughlin, will be awarded \$3,500 for being the principal investigator. I will receive \$1,200 for being the faculty mentor on the project. In addition, if a proposal based on this research is accepted for the annual AERA meeting, GED will cover travel expenses.

School of Education, Virginia Tech, Faculty Research Grant (April, 2006), PI: Serge Hein, co-PI: Gary Skaggs. *A Comparison of the Yes/No and Testlet Bookmark Standard Setting Procedures.* A follow-up study to the ASPIRES grant will compare our variation of the bookmark standard setting procedure to another promising method for a passage-based educational achievement test. Amount: \$6,700

School of Education, Virginia Tech, Faculty Research Grant (April, 2006), PI: Gary Skaggs, Co-PI: Edward Wolfe. *Differential Item Functioning on Computerized Adaptive Tests.* This study will examine the equivalence of DIF indices under CAT conditions, i.e. when data are non-randomly sparse. Amount: \$5,350

Bradley Hanson Award for Contributions to Educational Measurement, April 15, 2005: Prestigious award granted by the National Council on Measurement in Education for developing a prototype software exchange website. Amount: \$1,000

University ASPIRES grant (2005-2006): Awarded for a proposal to test a new method for setting passing scores on passage-based educational achievement tests. A paper based on this research was presented at the 2006 Annual Meeting of the National Council on Measurement in Education, San Francisco, and recently accepted for publication by *Applied Measurement in Education*. Amount: \$26,000

MANUSCRIPTS UNDER SUBMISSION

Skaggs, G., & Hein, S. F. Reducing the cognitive complexity associated with standard setting: A comparison of the single-passage bookmark and yes/no methods. Manuscript submitted to *Journal of Applied Measurement*.

Hein, S. F., & Skaggs, G. *Conceptualizing the classroom of target students: A qualitative investigation of panelists' experiences during standard setting*. Manuscript submitted to *Educational Measurement: Issues and Practice*.

UNIVERSITY SERVICE, 2001-2009

Member, University Committee on Evaluation of Teaching, 2007-

Member, School of Education, ELPS Unit, Promotion and Tenure Committee, 2009-

Member, Member, School of Education Assessment Committee, 2009-

Member, School of Education Graduate Task Force, 2007-8

Member, University Library Committee, 2001-2003.

Member, Awards Committee, College of Liberal Arts and Human Science, 2003-2006.

PROFESSIONAL SERVICE AND OUTREACH

Secretary and Newsletter Editor, Division D of American Educational Research Association.
Elected to a two-year term in April, 2006

Board of Editors, *Educational Measurement: Issues and Practice*, 2006-.

Board of Editors, *Applied Measurement in Education*, 2005-.

Member of the Technical Advisory Committee of the GED Testing Service, 2009-.

Technical Advisory Committee, Assessment, Learning and Technology Solutions (ALTS), Inc., 2009-.

Member of Outreach Committee, National Council on Measurement in Education, 2004-2006.

Proposal reviewer for the National Assessment of Educational Progress Secondary Analysis Grant Program, National Center for Education Statistics. 2000-2004.

Chair, Elections Committee, National Council on Measurement in Education, 1995-97.

Member of the Consensus Planning Committee for the 1996 National Assessment of Educational Progress, Science, 1991.

Reviewer of Annual Meeting paper proposals for the American Educational Research Association and National Council on Measurement in Education, 1987--.

Discussant at Annual Meetings of the American Educational Research Association and the National Council for Measurement in Education, and National Conference on Large-scale Assessment of the Council for Chief State School Officers.

Manuscript reviewer for *Applied Measurement in Education*, *Journal of Educational Measurement*, *Educational Measurement: Issues and Practice*, *Journal of Statistics Education*, *European Psychology*.

OTHER PROFESSIONAL ACTIVITIES (Consulting)

GED Testing Service (American Council on Education): equating and scaling of GED Test forms, 1987-present; author of *GED Technical Manual*, 1991-1993; test validation and psychometric research; 1991-present; development of software to scale and equate GED Tests, 1992; research into the feasibility of using IRT to scale and equate GED Tests, 1993; measurement issues seminars, 1994-1995; panel to determine the feasibility of developing Spanish language GED Tests, Spanish GED equating and scaling, 1995-7; psychometric advisory panel, 1999-; test form reliability analyses, 2002-.

American Society of Military Comptrollers, revision of certification examination program; field test analysis, test design and analysis, 2003-.

National Center for Education Statistics: technical review of Center projects related to psychometric linking, project direction for SASS/NAEP linked database research and development study, 1999-2006.

Association of Government Accountants: revised certification examination program; field test analysis, test design and analysis, standard setting, 2001-2003.

Maryland State Department of Education: evaluation of character education programs for federally funded pilot program, 1997-2002.

Chesterfield County (VA) Public Schools: scaled and equated of 9th grade English exam, 1999-2000.

National Assessment Governing Board: technical work related to the Voluntary National Test and National Assessment of Educational Progress, 1998-1999.

PROFESSIONAL MEMBERSHIP

American Educational Research Association: Division D
American Psychological Association, Division 5
National Council on Measurement in Education
National Association of Test Directors

REFERENCES

References are furnished upon request.