

Annotated Curriculum Vitae for Dr. MJ Gierl

January, 2008

Education

Graduate: University of Illinois at Urbana-Champaign
Ph.D., Educational Measurement and Evaluation, 1996
Champaign, IL, U. S. A.

University of Alberta
M.Ed., School Psychology, 1993
Edmonton, AB, Canada

Undergraduate: University of Alberta
B.A. (Honors), Psychology, 1991
Edmonton, AB, Canada

Current Positions

Professor of Educational Psychology, Department of Educational Psychology, Faculty of Education, University of Alberta

Canada Research Chair in Educational Measurement and **Professor**, Centre for Research in Applied Measurement and Evaluation, Department of Educational Psychology, Faculty of Education, University of Alberta

Director, Centre for Research in Applied Measurement and Evaluation (CRAME), Faculty of Education, University of Alberta

Area Coordinator, Measurement, Evaluation, and Cognition, Department of Educational Psychology, Faculty of Education, University of Alberta

Primary Research Interests

Educational and psychological measurement, focusing on cognitive diagnostic assessment; assessment engineering, including construct mapping, automated item generation, and automated test assembly; differential item and bundle functioning; unidimensional and multidimensional item response theory; psychometric methods for evaluating test translation and adaptation

Select Refereed Publications

Leighton, J. P., & Gierl, M. J. (Eds.) (2007). *Cognitive diagnostic assessment for education: Theory and practices*. Cambridge University Press.

Gierl, M. J., Zheng, Y., & Cui, Y. (in press). Using the attribute hierarchy method to identify and interpret the cognitive-basis of group differences. *Journal of Educational Measurement*.

Gierl, M. J., & Zhou, J. (in press). Computer adaptive—attribute testing: A cognitive psychological approach. To appear in the Special Issue of *Zeitschrift für Psychologie—Journal of Psychology* (Spring, 2008), Adaptive Models of Psychological Testing, Wim J. van der Linden (Guest Editor).

- Gierl, M. J., Wang, C., & Zhou, J. (2007). Using the attribute hierarchy method to make diagnostic inferences about examinees' cognitive skills in algebra on the SAT[®]. *Journal of Technology, Learning, and Assessment*, 6 (4). Retrieved [date] from <http://www.jtla.org>.
- Gierl, M. J. (2007). Making diagnostic inferences about cognitive attributes using the rule space model and attribute hierarchy method. *Journal of Educational Measurement*, 44, 325-340. Invited Paper appearing in Special Issue on IRT-Based Cognitive Diagnostic Models and Related Methods, Lou DiBello & William Stout (Guest Editors).
- Leighton, J. P., & Gierl, M. J. (2007). Defining and evaluating models of cognition used in educational measurement to make inferences about examinees' thinking processes. *Educational Measurement: Issues and Practice*, 26, 3-16.
- Bolt, D. M., & Gierl, M. J. (2006). Testing features of graphical DIF: Application of a regression correction to three nonparametric statistical tests. *Journal of Educational Measurement*, 43, 313-333.
- Gierl, M. J., Leighton, J. P., Tan, X. (2006). Evaluating DETECT classification accuracy and consistency when data display complex structure. *Journal of Educational Measurement*, 43, 265-289.
- Puhan, G., & Gierl, M. J. (2006). Evaluating the effectiveness of two-stage testing on English and French versions of a science achievement test. *Journal of Cross-Cultural Psychology*, 37, 136-154.
- Gierl, M. J., Tan, X., & Wang, C. (2005). *Identifying content and cognitive dimensions on the SAT* (Research Report No. 2005-11). New York: The College Board.
- Gierl, M. J. (2005). Using a dimensionality-based DIF analysis paradigm to identify and interpret constructs that elicit group differences. *Educational Measurement: Issues and Practice*, 24, 3-14.
- Leighton, J. P., Gierl, M. J., & Hunka, S. (2004). The attribute hierarchy method for cognitive assessment: A variation on Tatsuoka's rule-space approach. *Journal of Educational Measurement*, 41, 205-236.
- Gierl, M. J., Gotzmann, A., & Boughton, K. A. (2004). Performance of SIBTEST when the percentage of DIF items is large. *Applied Measurement in Education*, 17, 241-264.
- Ercikan, K. Gierl, M. J., McCreith, T., Puhan, G., & Koh, K. (2004). Comparability of bilingual versions of assessments: Sources of incomparability of english and french versions of Canada's national achievement tests. *Applied Measurement in Education*, 17, 301-321.
- Gierl, M. J., Bisanz, J., Bisanz, G., & Boughton, K. (2003). Identifying content and cognitive skills that produce gender differences in mathematics: A demonstration of the DIF analysis framework. *Journal of Educational Measurement*, 40, 281-306.

Select Presentations

[Please note that many of these conference papers are available on the CRAME website at www.education.ualberta.ca/educ/psych/crame.html.]

- Gierl, M. J. (2007, April). *Engineering and evaluating mathematics assessments using the Attribute Hierarchy Method*. R. Luecht (Chair), Assessment Engineering: An Emerging Discipline. Symposium conducted at the 2007 annual meeting of the National Council on Measurement in Education, Chicago, IL.
- Gierl, M. J., Cui, Y., & Hunka, S. (2007, April). *Using connectionist models to evaluate examinees' response patterns on tests using the Attribute Hierarchy Method*. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago, IL.
- Tan, X., & Gierl, M. J. (2007, April). *Refinement of the DETECT indices for evaluating the strength and structure of multidimensionality*. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago, IL.
- Wang, C., & Gierl, M. J. (2007, April). *Investigating the cognitive processes underlying student performance on the SAT Critical Reading subtest*. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago, IL.
- Gierl, M. J., & Huff, K. (2007, February). *Cognitive diagnostic assessment: Current research and implementation issues*. Paper presented at the annual meeting of the Association of Test Publishers, Palm Springs, CA.
- Gierl, M. J., Leighton, J. P., & Tan, X. (2006, April). *Evaluating the cluster consistency of DETECT when the data display complex structure*. Paper presented at the annual meeting of the National Council on Measurement in Education, San Francisco, CA.
- Luecht, R. M., Gierl, M. J., Tan, X., & Huff, K. (2006, April). *Scalability and the development of useful diagnostic scales*. Paper presented at the annual meeting of the National Council on Measurement in Education, San Francisco, CA.
- Cui, Y., Leighton, J. P., Gierl, M. J., & Hunka, S. (2006, April). *A person-fit statistic for the attribute hierarchy method: The hierarchical consistency index*. Paper presented at the annual meeting of the National Council on Measurement in Education, San Francisco, CA.
- Tan, X., & Gierl, M. J. (2006, April). *Evaluating the consistency of DETECT indices and item clusters using simulated data that display both simple and complex structure*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.
- Wang, C., Gierl, M. J., & Leighton, J. P. (2006, April). *Investigating the cognitive processes underlying student performance on a foreign language reading test: An application of the attribute hierarchy method*. Poster presented at the annual meeting of the American Educational Research Association, San Francisco, CA.
- Leighton, J. P., & Gierl, M. J. (2005, May). *Identifying models of cognition in educational measurement: What are the costs and benefits with each?* Paper presented at the annual meeting of the Canadian Society for the Study of Education, London, ON.
- Gierl, M. J., Tan, X., Wang, C. (2005, April). *Identifying cognitive dimensions that affect student performance on the New SAT*. In M. Gierl & K. Huff (Chairs), *Enhancing the Diagnostic Value of Large-Scale Achievement Tests: Technical Developments and Applications*. Paper presented in symposium conducted at the annual meeting of the National Council on Measurement in Education, Montréal, Quebec, Canada.

- Walker, C., Gierl, M. J., & Ricker, K. (2005, April). *Assessing differential item functioning among multiple groups: A power and type I error analysis using TESTGRAF*. Paper presented at the annual meeting of the National Council on Measurement in Education, Montréal, Quebec, Canada.
- Ricker, K., & Gierl, M. J. (2005, April). *The consequences of multidimensionality to the robustness of IRT equating using a common-items nonequivalent groups design*. Paper presented at the annual meeting of the National Council on Measurement in Education, Montréal, Quebec, Canada.
- Tan, X., & Gierl, M. J. (2005, April). *Using local DIF analyses to assess group differences on multilingual examinations*. Poster presented at the annual meeting of the National Council on Measurement in Education, Montréal, Quebec, Canada.
- Li, Y., Y., & Gierl, M. J. (2004, October). *Translating achievement tests: The use of the multidimensional DIF analysis paradigm for enhancing fairness and equity*. Paper presented at the International Testing Commission Fourth International Conference on Equitable Assessment Practices, Williamsburg, VA, U. S. A.
- Gierl, M. J. (2004, May). *Using the multidimensional-based DIF analysis paradigm to identify and interpret subgroup differences on educational and psychological tests*. Paper presented at the annual meeting of the Canadian Society for the Study of Education, Winnipeg, MB.
- Ricker, K., & Gierl, M. J. (2004, May.). *The effects of violating the unidimensionality assumptions in IRT test equating*. Paper presented at the annual meeting of the Canadian Society for the Study of Education, Winnipeg, MB.
- Gierl, M. J. (2004, April). *Using the DIF analysis framework to identify the matching and studied subtest for multidimensional tests*. Paper presented at the annual meeting of the National Council on Measurement in Education, San Diego, CA.
- Bolt, D. M., & Gierl, M. J. (2004, April). *Application of a regression correction to three nonparametric tests of DIF: Implications for local DIF assessment*. Paper presented at the annual meeting of the National Council on Measurement in Education, San Diego, CA.
- Gierl, M. J., Bisanz, J., & Li, Y. Y. (2004, April). *Using the multidimensionality-based DIF analysis framework to study cognitive skills that elicit gender differences*. Paper presented at the annual meeting of the National Council on Measurement in Education, San Diego, CA.

If you have any questions or comments, please contact me at mark.gierl@ualberta.ca.