

YEOW MENG THUM

Yeow Meng Thum joined the Northwest Evaluation Association in Lake Oswego, Oregon, as a Senior Research Fellow after teaching for three years at the College of Education at Michigan State University in Fall 2005 and for six years at the Graduate School of Education and Information Studies at the University of California, Los Angeles. Prior to joining UCLA, Dr. Thum served as Analysis Director at the Consortium on Chicago School Research, University of Chicago from 1994 to 1998. Dr. Thum is a research methodologist with substantive interests surrounding the use of testing results in formulating public educational policy. His methodological research focuses on multivariate, multilevel models for behavioral and educational data, with a strong emphasis on methods for describing educational and psychological growth and change. More general methodological interests extend to multivariate analysis of continuous and discrete data, including modern psychometric measurement. These investigations have led to new designs for indicators of school performance based on student achievement test results. What unifies Dr. Thum's research strands is an overarching concern with the nature of making arguments in every form and with the structure of statistical arguments in particular. His paper with Professor Anthony S. Bryk of the University of Chicago detailing an exploration of student and school characteristics of at-risk high school students received the 1991 AERA Palmer O. Johnson Award for best article published in all five AERA-sponsored journals in 1989-1990.

ACKNOWLEDGED WORK

Dr. Thum's contributions to extending multilevel models to the case of multiple outcomes, small samples, and missing outcome data are acknowledged in several texts, including Raudenbush and Bryk (2002, *Hierarchical Linear Models*), Timm (2002, *Applied Multivariate Analysis*), Congdon (2001, *Bayesian Statistical Modelling*). His work on applying Bayesian multivariate multilevel models for profiling the performance of teachers, grade-levels, and schools is widely acknowledged and has appeared in *Sociological Methods & Research*. Dr. Thum presented his work on accountability most recently at invited sessions at the 2005 Annual Meeting of the American Educational Research Association in Montreal and at the University of Maryland Conference on Longitudinal Modeling of Student Achievement in November of 2005. His methodological research has also appeared in the *Journal of Educational & Behavioral Statistics*, the *American Educational Research Journal*, the *Educational Evaluation & Policy Analysis*, the *Social Psychology of Education*, the *Economics of Education Review*, and the *Journal of Psycholinguistic Research*. An invited article on covariance structure analysis appeared recently in the *Encyclopedia of Statistics in Behavioral Science* (Wiley, 2005). In December 2005, Dr. Thum led an invited discussion at the National Research Council Symposium on the use of longitudinal school-level assessment data. Outside of the US, Dr. Thum had offered workshops in Singapore (2007), Malaysia (2007), Spain (2008), and Mexico (2008).

PRESENT POSITION

Senior Research Fellow
Northwest Evaluation Association
Lake Oswego, OR 97035
yeow.meng@NWEA.ORG
(503) 624-1951

EDUCATION

- University of Chicago, Ph.D. (1994). Committee on Research Methodology and Quantitative Psychology
- Columbia University in the City of New York, AB. (1976-1980). Department of Psychology.

DOCTORAL THESIS

Analysis of Individual Variation: A Multivariate Hierarchical Linear Model for Behavioral Data (1994)

AWARDS

- AERA 1991 Palmer O. Johnson Award (with Prof. A. S. Bryk) for best paper (in AERJ below) published in all five AERA-sponsored journals in 1989-1990.

PROFESSIONAL EXPERIENCE

- Senior Research Fellow (2008-present). Northwest Evaluation Association, Lake Oswego, Oregon 97035, USA.
- Visiting Scholar (2008). Facultad de Educación - Centro de Formación del Profesorado, Universidad Complutense de Madrid, Madrid, Spain.
- Assistant Professor (2005-2008). Measurement & Quantitative Methods, Dept. of Counseling, Educational Psychology, & Special Education, College of Education, Michigan State University.
- Assistant Professor (Step IV) (1998 – 2005). Social Research Methodology Division, Graduate School of Education and Information Studies, University of California, Los Angeles.
- Technical Advisory Committee Member (2005 – present). Longitudinal Study of Certification Programs. American Board for Certification of Teacher Excellence (ABCTE).
- Visiting Scholar (Sep 2004). Center for Research on Pedagogy and Practice, National Institute of Education, Nanyang Technological University, Republic of Singapore.
- Visiting Scholar (Sep 2004). School of Educational Studies, University Sains Malaysia, Penang, Malaysia.
- Advisory Panel Member (2003 – present). Federally funded National Office for Rural Measurement and Evaluation Systems (NORMES).
- Analysis Director (1994-1997) Consortium on Chicago School Research, University of Chicago, Chicago, Illinois.
- Consultant (1992-94) Research with Prof. A. S. Bryk on the Chicago Public School Achievement Data for the Chicago Panel on Public School.
- Consultant (1988-94) Advisor for HLM/2L program for Scientific Software, Inc., Chicago, Illinois.

- Teaching Assistant (1988) University of Chicago, Prof. L. V. Hedges, Quantitative Inquiry-2.
- Teaching Assistant (1987) University of Chicago, Prof. A. S. Bryk, Applications of Hierarchical Linear Models.
- Teaching Assistant (1984-85) University of Chicago, Prof. R. D. Bock, Qualitative Inquiry 1-2; Quantitative Inquiry 3-4.

PUBLICATIONS AND PRESENTATIONS

Research Articles

1. Holtrop, J. S., Dosh, S. A., Torres, T., & Thum, Y. M. (2008). The Community Health educator Referral Liaison (CHERL): A Primary Care Practice Role for Promoting Healthy Behaviors. *American Journal of Preventive Medicine*, 35, S365-S372.
2. Schacter, J., Thum, Y. M., & Zifkin, D. (2006). "How Much Does Creative Teaching Enhance Elementary School Students' Achievement?" *Journal of Creative Behavior*, 40(1), 47-72.
3. Doss, B. D., Thum, Y. M., Sevier, M., Atkins, D. C., & Christensen, A. (2005). "Improving relationships: Mechanisms of change in couple therapy." *Journal of Consulting & Clinical Psychology*, 73 (4), 624-633.
4. Schacter, J. & Thum, Y. M (2005). "TAPping into High Quality Teachers: Preliminary results from the Teacher Advancement Program comprehensive school reform." *School Effectiveness & School Improvement*, 16 (3), 327-353.
5. Schacter, J. & Thum, Y.M. (2004). "Paying for high and low-quality teaching." *Economics in Education Review*, 24, 411-430.
6. Abu-Akel, A., Bailey, A. L., & Thum, Y. M. (2004). "Optionality and individual variation in the acquisition of the determiners 'a' and 'the' in English: A longitudinal study." *Journal of Psycholinguistic Research*, 33, 407-424.
7. Seltzer, M., Choi, K. & Thum, Y. (2003). "Examining relationships between where students start and how rapidly they progress: Implications for conducting analyses that help illuminate the distribution of achievement within schools." *Educational Evaluation & Policy Analysis*, 25 (3), 263-286.
8. Thum, Y. M. (2003). "Measuring Progress towards a Goal: Estimating Teacher Productivity using a Multivariate Multilevel Model for Value-Added Analysis." *Sociological Methods & Research*, 32 (2), 153-207.
9. Thum, Y. M. & Bhattacharya, S. K. (2001). "Detecting a Change in School Performance: A Bayesian Analysis for a Multilevel Join Point Problem." *Journal of Educational and Behavioral Statistics*, 26 (4), 443-468.
10. Bryk, A. S., Thum, Y. M., Easton, J. Q., & Luppescu, S. (1998). "Assessing School Productivity Using Student Achievement: The Chicago Public Elementary Schools." *Social Psychology of Education*, 2, 103-142.
11. Thum, Y. M. (1997). "Hierarchical linear models for multivariate behavioral data." *Journal of Educational and Behavioral Statistics*, 22 (1), 77-108.
12. Bryk, A. S., Deabster, P., Easton, J. Q., Luppescu, S. & Thum, Y. M. (1994). "Measuring achievement gains in the Chicago Public Schools." *Education and Urban Society*, 26, 306-319.
13. Thum, Y. M. (1994). "Analysis of Individual Variation: A Multivariate Hierarchical Linear Model for Behavioral Data." Unpublished doctoral dissertation, Department of Psychology, University of Chicago.
14. Bryk, A. S. & Thum, Y. M. (1989). "The effects of high school organization on dropping out: An exploratory investigation." *American Educational Research Journal*, 29, 353-383.

Book Chapters

1. Youngs, P., Frank, K. A., Thum, Y. M., & Low, M. R. (in press). "The motivation of teachers to produce human capital and conform to their social contexts." In T. M. Smith, L. Desimone, & A. Porter (Eds.), *Issues in the Induction and Mentoring of New Teachers*.
2. Thum, Y. M. (2006). "Designing Gross Productivity Indicators: A proposal for Connecting Accountability Goals, Data, and Analysis." In R. Lissitz (Ed.), *Longitudinal and Value-Added Models of Student Performance*. (pp. 436 - 479). Maple Grove, MN: JAM Press.
3. Thum, Y. M. (2005). Covariance Structure Analysis. In Brian Everitt & David Howell (eds.) *Encyclopedia of Behavioral Statistics*. Wiley.
4. Thum, Y. M. & A. S. Bryk, A. S. (1997) "Value-added Productivity Indicators: The Dallas System." In Jason Millman (Ed.) *Grading Teachers, Grading Schools: Is Student Achievement a Valid Evaluation Measure?* Pages 100-109. CA: Corwin.

Book Reviews

1. Thum, Y. M. (2003). Book Review of Gregory J. Cizek (ed.), "Setting Performance Standards: Concepts, Methods, and Perspectives." (Hillsdale, NJ: Lawrence Erlbaum; 2001). *Applied Psychological Measurement*, 27, 305-307.
2. Thum, Y. M. (2004). "Some Additional Perspectives on Representing Behavioral Change and Individual Variation in Psychology." Invited commentary on focus article "A Manifesto on Psychology as Idiographic Science: Bringing the Person Back into Scientific Psychology - This Time Forever" by Peter C. M. Molenaar in *Measurement: Interdisciplinary Research and Perspectives*, 2 (4), 235-240.

Manuscripts under Revision

1. Thum, Y. M. "Standard Setting as a Scaling Problem: A Compound Likelihood Approach."
2. Thum, Y. M. "Challenges of Meta-Analysis from the Standpoint of a Latent Variable Framework: A New Approach for Synthesizing the Results from Several Multiple Regressions."
3. Thum, Y. M., Abu-Akel, A., & Subedi, D. "Describing Development and Evaluating Change when Response Schedules are Asynchronous among Subjects: Some Applications of Change-point Modeling."

Manuscripts in Preparation

1. Thum, Y. M., & Wang, S. "Accelerated Longitudinal Designs for Vertical Scaling."
2. Thum, Y. M., & Wang, S. "A Rasch Model for Item Calibration Using Clustered Samples of Examinees."

Research Reports

1. Thum, Y. M. (2011). *Measuring Student Growth and Achievement against College Readiness Benchmark and the ACT*. Unpublished technical white paper prepared for the National Charter Schools Institute, Mt. Pleasant, MI.
2. Thum, Y. M., & Xiang, Y. (2010). "Representing the Learning Productivity of Students at a School with an Effect-Size Indicator in a Pay-for-Performance Application." Northwest Evaluation Association, Lake Oswego, OR.

3. Thum, Y. M., & Bowe, B. (2009). "An effect-size indicator for measuring the productivity of a teacher based on the learning growth of her students with applications." Technical Report. Grand Rapids, MI: The National Heritage Academies.
4. van der Ploeg, A. & Thum, Y. M. (2004). "Finding Additional Value in New Accountability Systems." Learning Point Associates Report.
5. Thum, Y. M. (2003). "A School Accountability Model for Measuring Adequate Yearly Progress under the No Child Left Behind Act." A comparative study of value-added accountability models sponsored by the Education Performance Network of the New American Schools, Alexandria, Virginia. Co-analysts are William Sanders (University of North Carolina, Chapel Hill), Rob Meyer (University of Wisconsin), A. S. Bryk (University of Chicago), and Stephen W. Raudenbush (University of Michigan). Fall 2002, Spring, and Summer 2003.
6. Thum, Y. M. (2002). "No Child Left Behind: Methodological Challenges & Recommendations for Measuring Adequate Yearly Progress." CSE Technical Report 590. Los Angeles: Center for Research on Evaluation, Standards, and Student Testing, UCLA
7. Thum, Y. M. (2002). "Measuring Student and School Progress with the California API." CSE Technical Report 578. Los Angeles: Center for Research on Evaluation, Standards, and Student Testing, UCLA.
8. Seltzer, M., Choi, K. & Thum, Y. (2002). "Latent variable modeling in the hierarchical modeling framework: Exploring initial status \times treatment interactions in longitudinal studies." CSE Technical Report 559. Los Angeles: Center for Research on Evaluation, Standards, and Student Testing, UCLA.
9. Bryk, A. S., Thum, Y. M., Easton, J. Q., and Luppescu, S. (March 1998) "Academic productivity of Chicago Public Elementary Schools." Technical Report Sponsored by the Consortium on Chicago School Reform's Examining Productivity Series. (<http://www.consortium-chicago.org>.)
10. Sebring, P. B., Bryk, A. S., Roderick, M., Camburn, E., Luppescu, S., Thum, Y. M., Smith, B., & Kahne, J. (1996). Charting Reform in Chicago: The Student Speaks. Chicago: Consortium on Chicago School Research.
11. Sebring, P. B., Bryk, A. S., Luppescu, S., & Thum, Y. M. (1995). Charting Reform in Prairie School: Results of Student and Teacher Surveys. Chicago: Consortium on Chicago School Research.
12. Sebring, P. B., Bryk, A. S., Easton, J. Q., Luppescu, S., Thum, Y. M., Lopez, W. A., & Smith, B. (1995). Charting Reform: Chicago Teachers Take Stock. Chicago: Consortium on Chicago School Research.
13. Thum, Y. M., Bock, R. D. & Bryk, A. S. (1987). "An item-response model for linearly ordered content domains." Paper prepared for the California Assessment Program.

Invited presentations/papers

1. Thum, Y. M. (2011). "Standard Setting as a Scaling Problem: A Compound Likelihood Approach." Paper presented at the 2011 NCME Annual Meeting, New Orleans, LA.
2. Wei, H., McCall, M., Thum, Y. M., & Hauser, C. (2011). "Pre-test Item Calibration for Computerized Adaptive Test." Paper presented at the 2011 NCME Annual Meeting, New Orleans, LA.
3. Ma, L., Wise, S., Thum, Y. M., & Kingsbury, G. (2011). "Detecting Response Time Threshold under the Computer Adaptive Testing Environment." Paper presented at the 2011 NCME Annual Meeting, New Orleans, LA.
4. Kao, S., & Thum, Y. M. (2010). "Characterizing the Dimensionality of a Set of Random Variables: A strategy to Analyze Factor Structures." Paper presented at the 2010 NCME Annual Meeting, Denver, CO.

5. Thum, Y. M. (2009). "Using Assessments in Educational Accountability." Invited presentation at the June 30 – July 2 2009 OECD-Mexico Joint Workshop on Educational Quality Standards and Assessment, Mexico City, Mexico.
6. Thum, Y. M., & Bowe, B. (2009). "An Effect-size Indicator of a Teacher's Productivity based on the Learning Growth of her Students." Paper presented at 2008 Annual Meeting of the American Educational Research Association, San Diego CA.
7. Y. M. Thum (2008, Nov.). "An Effect-size Indicator for Teaching Productivity." Paper presented at 2008 Annual Conference of the Arizona Educational Research Organization, Phoenix, AZ.
8. Thum, Y. M. (2008). "A method of meta-regression analysis from the standpoint of a latent variable framework." Paper presented at 2008 Annual Meeting of the American Educational Research Association, New York, NY.
9. Thum, Y. M. (2007). "Importance of Student Learning in Accountability: Value-added Analyses and Growth Models." Invited presentation by the Illinois Education Roundtable's November 5 Special ILERT/ISBE Growth Model Assessment Forum.
10. Thum, Y. M., Chinen, M., & Wang, H. (2007). "On measuring learning performance, outcome equity, and school excellence." Paper presented at 2007 Annual Meeting of the American Educational Research Association, Chicago, IL.
11. Y. M. Thum, & Ahn, S. (2007, May) "Challenges of Meta-Analysis from the Standpoint of A Latent Variable Framework." Paper presented at the Seventh Annual International Campbell Collaboration, London, UK.
12. Thum, Y. M. (2007). "Effective schools for low income, urban students: The Philadelphia story." Paper presented at 2007 Annual Meeting of the American Educational Research Association, Chicago, IL.
13. Thum, Y. M. (2006). "Graphical approaches to reporting results of 'value-added' analysis in education." Paper presented at 2006 Annual Meeting of the American Educational Research Association (School Indicators, Profiles, and Accountability SIG), San Francisco, CA.
14. Thum, Y. M., Wang, A. H., & Walters, A. M. (2006). "Value-added assessments in action: Philadelphia's new School Performance Index." Proceedings of the International Conference on Educational Evaluation, November 11-12, 2006, Taipei, Taiwan, convened by the Center for Research on Educational Evaluation and Development, National Taiwan Normal University.
15. Thum, Y. M., (2006). "Improving Educational Data, Statistical Models, and Assessment Designs for No Child Left Behind: The Role of Educational Statisticians." Panelist, 2006 Annual Meeting of the American Educational Research Association (Educational Statisticians SIG), San Francisco, CA.
16. Thum, Y. M., (2005). "Controlling for Student and School Differences: Growth Modeling Approach." Paper presented at Board of Testing and Assessment, National Research Council Symposium: Use of School-level Student Assessment, Washington D.C., December 8 & 9.
17. Thum, Y. M. (2005). "Designing School Productivity Indicators: Connecting Goals, Data, & Models." Presented at the presidential invited session on Empirical Investigations of Value-Added Modeling for Accountability 2005 Annual Meeting of the American Educational research Association, Montreal, Canada.
18. Thum, Y. M., (2005). "Measuring and Comparing Academic Progress towards a Standard Using Bayesian Performance Profiles." Longitudinal Modeling of Student Achievement Conference, University of Maryland, November 7 & 8.
19. Thum, Y. M. (2004). "A Model-driven School Accountability System." Presented at the Annual Meeting of the National Council on Measurement in Education, San Diego, CA.
20. Thum, Y. M. (2003). "Measuring school progress requires longitudinal analysis." Presented at the 33rd Council of Chief State School Officers (CCSSO) National Conference Large Scale Assessment, San Antonio, TX.

21. Thum, Y. M. (2003). "Making AYP-NCLB: A sample analysis." Presented at the Annual Meetings of the American Educational Research Association, Chicago, IL.
22. Thum, Y. M. & Seltzer, M. (2003). "Using sufficient statistics in MCMC solutions of the Bayesian hierarchical linear model." Presented at the Annual Meetings of the American Educational Research Association, Chicago, IL.
23. Thum, Y. M. (2002). "Measuring Progress toward a Goal: Inference for the Ratio of Change Relative to Initial Distance from a Targeted Performance Level." Presented at the American Educational Research Association Annual Conference, April 2002, New Orleans.
24. Seltzer, M., Choi, K. C., & Y. M. Thum (2002). "Examining Relationships between Where Students Start and How Rapidly They Progress: Some implications for Monitoring School Performance." Presented at the American Educational Research Association Annual Conference, April 2002, New Orleans.
25. Thum, Y. M. (2002). "No Child Left Behind: Methodological Challenges & Recommendations for Measuring Adequate Yearly Progress," Presented at the CRESST Annual Conference, September 2002, Los Angeles.
26. Thum, Y. M. (2002). Presenter, "Issues of Assessment, Accountability, and NCLB." Midwest Assessment Forum, November 2002, Chicago, IL.
27. Thum, Y. M. (2002). Planners' Meeting, "Value-added Accountability Models Study." EPN/NAS, August 2002, Washington, DC.
28. Thum, Y. M. (2002). Discussant, "Monitoring Student Progress and the State of Education in L A County: Lessons from the External Evaluation of LAAMP," The Los Angeles County Alliance for Student Achievement, February 2002, Occidental College, Eagle Rock.
29. Thum, Y. M. (2002). Presenter, "Measuring progress towards a target: Some essentials ingredients for school accountability," Program & Evaluation Branch (PERB), Los Angeles Unified School District.
30. Thum, Y. M. (2001). "Ranking Schools on the California API: A Multivariate Multilevel." Presented at the American Educational Research Association Annual Conference, April 2001, Seattle.
31. Seltzer, M., Choi, K. C., & Thum, Y. M. (2000). "Hierarchical linear modeling with latent variable regression." Presented at the CRESST Annual Conference, September 2000, UCLA.
32. Thum, Y. M. & Castro, M. (2000). "Disaggregating the California API." Presented at the CRESST Annual Conference, September 2000, UCLA.
33. Grohar, I., Webb, N., Thum, Y. M., Seltzer, M., & Grasell, J. (2000). "Hierarchical Modeling Approaches for Comparing Group and Individual Contexts." Symposium presentation at the Annual Meetings of the American Educational Research Association, April 2000, New Orleans.
34. Choi, K. C., Seltzer, M., & Thum, Y. M. (2000). "Latent Variable Modeling in the Hierarchical Modeling Framework." Symposium presentation at the Annual Meetings of the American Educational Research Association, April 2000, New Orleans.
35. Bhattacharya, S. K. & Thum, Y. M. (2000). "System-wide evaluation when change is asynchronous." Symposium presentation at the Annual Meetings of the American Educational Research Association, April 2000, New Orleans.
36. Seltzer, M., Thum, Y.M. & Choi, K. (1999). "Studying interactions between initial status and program effectiveness in longitudinal studies." Presented at the CRESST Annual Conference, September 1999, UCLA.
37. Thum, Y. M. and Bhattacharya, S. K. "Effects of School Reform on Student Performance: A Multilevel Change-Point Analysis." Paper presented at the Annual Joint Statistical Meetings of the American Statistical Association, August 1999, Baltimore.
38. Thum, Y. M. (1998). Presenter, "Assessing Academic Performance: Some Notes on New Directions" Center for Research on Evaluation, Standards, and Student Testing (CRESST) Annual Conference, September 1998, UCLA.

39. Thum, Y. M., Bryk, A. S., Deabster, P., Luppescu, S., & Easton, J. Q. (1995). "Value-added indicators of elementary school improvement in the Chicago Public Schools." Paper presented at the American Educational Research Association Annual Meeting, San Francisco, April 1995.
40. Bryk, A. S., Easton, J., Dean, P., & Thum, Y. M. (1993). "Modeling school-level change and its correlates." Paper presented at the American Educational Research Association Annual Meeting, Atlanta, April 1993.
41. Thum, Y. M. (1989). "A two-stage random coefficient regression model for behavioral data: covariance structure analysis of the MTMM matrix." Paper presented at the European Meetings of the Psychometric Society, Leuven, Belgium, July 1989.
42. Thum, Y. M. (1987). "Two-stage models for dichotomous response data." Paper presented at the American Educational Research Association Annual Meeting in Washington, D. C., April 1997.

GRANTS

1. Co-PI (Pending). Youngs, P., Thum, Y.M., & Frank, K.A. (2007). A study of new teachers' language arts instructional practices and student learning in Michigan and Indiana districts. Institute of Educational Science Teacher Quality Reading and Writing Grants Program. East Lansing, MI: Michigan State University College of Education. \$700,000.
2. Co-I. (NIH, Pending). Dr. Jodi Holtrop (PI), Department of Family Medicine, Michigan state University. Innovative Primary Care Cessation Treatment for Smokers with Depressive Symptoms. National Institute of Health. Risk, Prevention, and Intervention for Addictions Study Section. \$2,578,270.
3. Co-I. (DOD, Pending). Adrian Blow, PI; Naomi Breslau (Epidemiology); Phil Reed (BRIC, Epidemiology); Yeow Meng Thum (MQM/Education); Barbara Ames, Karen Wampler, Lisa Gorman (all FCE); Jeanette Scheid (Psychiatry). Project Title: A Randomized Trial Testing the Efficacy of an Emotion-Focused Family-Based Intervention for PTSD among National Guard Soldiers. Department of Defense. Total Direct Costs: \$1,361,619.00 Total Costs: \$2,005,299.00
4. Co-PI on PI Professor Peter Young's study "A study of teacher retention and student learning in urban Michigan districts" with support from the Carnegie Corporation of New York. (\$385,000, June 2006 - June 2009)
5. University of California Office of Academic Senate, Council of Research, Faculty Grants Program
 - a. 2000-2001 Indicators of School Progress and Productivity.
 - b. 1999-2000 Detecting Change in School Performance: A multilevel change point analysis.
6. University of California Academic Personnel Office, Faculty Career Development Award
 - a. 2002-2003 A Proposal for Measuring School Progress and Equity.
 - b. 2001-2002 Estimating Time to Response with Multilevel Change-point Models.
 - c. 2000-2001 Measuring Educational Change in Equity.

PROFESSIONAL DEVELOPMENT AND TRAINING COURSES

1. Seltzer, M., Choi, K. C. & Thum, Y. M. (2003). "An Introduction to the use of WinBUGS in applications of hierarchical linear models in educational research." Annual Meetings of the American Educational Research Association, Chicago, IL.

COURSES OFFERED AT MSU

1. CEP 933: Quantitative methods in research II. This course introduces students to techniques of data analysis and statistical inference commonly employed in educational, sociological, and psychological research. Students will encounter many worked examples drawn from the text. Assignments are structured around the NELS88 and High School & Beyond databases. These databases contain extensive measurements of students' beliefs, aspirations, attitudes, health behaviors, and background, as well as related information from teachers, parents, and schools. The major topics are uni-variate and multiple regression and one- and two-factor analysis of variance with multiple comparisons and interactions. SPSS will be used, along with some SAS when necessary. We also give an introductory treatment of common instances of dependent observations in research on functional enterprises such as businesses, hospitals, and schools. Knowledge of basic algebra is required, as is adequate understanding of the fundamental principles of descriptive statistics and hypothesis testing (as covered, for example, in CEP 932 or its equivalent). Knowledge of calculus is not required.
2. CEP 935: Adv Multivariate Data Anly II -- Multilevel Modeling. Many research problems in the social sciences focus on the growth in knowledge and skills of individuals and of groups. In educational research, for example, children's growth in various natural settings such as the classroom and the school is typically the object of inquiry. However, understanding growth in organizational settings is fraught with difficulties under standard uni-level regression analyses. In fact, how to measure change and describe contextual effects on change, that is how to model nested processes, are two of the most troublesome and persistent methodological problems in the social sciences. This course is devoted to understanding these difficulties and their possible resolution using a multilevel, or hierarchical, modeling framework. The course will consider the statistical foundations of multilevel linear models, also known as hierarchical linear models (HLMs), and focuses on their application in behavioral and educational research.
3. CEP 991B: Seminar on Educational Indicators. This seminar attempts an organization of extant discussions on policy and analysis issues surrounding school performance indicators for the educational researcher. Participants will review of the history and structure of social indicators to be set against a historical sketch history of educational policy goals served by indicators. Guest presenters include faculty and colleagues who had close to first-hand policy or technical experience with educational indicators.

COURSES OFFERED AT MSU

4. Educ 230 A: *Introduction to Research Design and Statistics*. Education 230A is the first course in a three-course sequence in quantitative social science inquiry offered by the Education Department. The first half of the course lays the groundwork for sound statistical reasoning, focusing on how to use evidence in the service of empirical arguments. The analysis of data sets from a limited number of studies in various fields will play an important role in lectures and assignments. By doing statistics using simple data exploratory tools, the student is prepared to read and understand statistical statements. This exercise will provide a vehicle for discussing key aspects of research design and for illustrating the application of widely used statistical techniques. To develop an ability to better separate statistical fact from statistical judgment, the student is introduced during the latter half of the course to the basic ideas behind formal statistical inference.

5. Educ 230 C: *Linear Statistical Models: ANOVA*. A continuation of Educ 230B/C introductory sequence, this course introduces the basic logic underlying inference in experimentation. Topics focus on single and multi-factor analysis of variance for standard and quasi-experimental designs. Also included is basic contingency table analysis. Lectures and examples seek to clarify the strengths and limitations of the experiment in research in psychology and education.
6. Educ 230 D: *Advanced Inference Techniques*. This course mixes lectures and seminar style discussions on a wide range of regression techniques aimed at giving the students some coherence to the topics they have already covered or about to attempt in future advanced training. Beginning with a review of matrix algebra, topics will include modeling with univariate and multivariate regression, multivariate analysis of variance and covariance, and the analysis of multilevel data. Including one or two additional topics will depend on time and student interest. Computation and programming for model estimation and inference are illustrated with examples drawn from research in psychology and education.
7. Educ 255 C: *Seminar on Educational Indicators*. This seminar attempts an organization of extant discussions on policy and analysis issues surrounding school performance indicators for the educational researcher. Participants will review of the history and structure of social indicators to be set against a historical sketch history of educational policy goals served by indicators. Guest presenters include faculty and colleagues who had close to first-hand policy or technical experience with educational indicators.
8. Educ 231D: *Multilevel Analysis: Applications in Behavioral and Social Research*. Many research problems in the social sciences focus on the growth in knowledge and skills of individuals and of groups. In educational research, for example, children's growth in various natural settings such as the classroom and the school is typically the object of inquiry. But to understand growth in organizational settings is fraught with difficulties under traditional analyses. In fact, how to measure change and describe contextual effects on change, that is how to model nested processes, are two of the most troublesome and persistent methodological problems in the social sciences. This course is devoted to understanding these difficulties and their possible resolution using the multilevel modeling framework. The course will consider the statistical foundations of multilevel linear models, also known as hierarchical linear models (HLMs), and focus on their application in behavioral and social research.
9. Educ 231A: *Multivariate Analysis*. This course mixes lectures and several seminar style discussions to introduce a wide range of regression techniques based on the multivariate normal distribution. Beginning with an introduction to basic linear/matrix algebra, this survey reviews univariate and multivariate regression, multivariate analysis of variance and covariance. From these basic tools for understanding multivariate mean structures, the course moves on to covariance structures analyses, techniques that aimed at revealing the basic dimensions underlying a larger set of observed variables. Finally, we consider approaches for classifying observations in terms of a fixed set of measures. Computation and

programming for estimation and inference are illustrated with a wide range of examples, mainly from applications in the social sciences.