BIOGRAPHICAL SKETCH

NAME: S. Natasha Beretvas

eRA COMMONS USER NAME: snb4267

POSITION TITLE: Professor, Department of Educational Psychology

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date MM/YYYY	FIELD OF STUDY
Duke University, Durham, NC	BS	05/1989	Mathematics, Psychology
University of Washington, Seattle, WA	MEd	05/1997	Measurement Statistics and Research Design
University of Washington, Seattle, WA	PhD	06/2000	Measurement Statistics and Research Design

A. Personal Statement

I am a Professor in the Quantitative Methods program in the Department of Educational Psychology at The University of Texas at Austin. My research focuses on multilevel modeling with a focus on extensions to the conventional multilevel model for handling student mobility and other sources of data structure complexities. I also focus some of my research on methodological innovations in meta-analysis. I have been the PI or Co-PI on five funded IES grants (three methodological and two applied) including two current grants. I have published methodological papers in flagship quantitative methods journals including *Multivariate Behavioral Research*, *Psychological Methods*, *Structural Equation Modeling*, *Journal of Educational Measurement*, *Applied Psychological Measurement*, among others. I have recently co-edited two books, including one entitled, *Advances in Multilevel Modeling for Educational Research: Addressing Practical Issues Found in Real-World Applications*. I have authored chapters on cross-classified and multiple-membership models in methodological handbooks (including the *Handbook of Multilevel Analysis* and *Multilevel Modeling of Educational Data*) as well as applied handbooks (including *Research on Family-School Partnerships: An Interdisciplinary Examination of State of the Science and Critical Needs* and the *Handbook of Classroom Management*). I have been a member of the Design and Analysis Committee for NAEP, was elected to join the Society for Research Synthesis Methodology, have served as a member of IES peer review panels since 2008, am the incoming co-Editor-in-Chief of *Research Synthesis Methods,* and have served as Associate Editor for the *Journal of School Psychology* and for the *Journal of Educational Psychology*. I am currently a member of multiple editorial boards including *Structural Equation Modeling* and *Journal of Research on Educational Effectiveness* as well as serve as an ad hoc reviewer for numerous other methodological and applied journals. In addition to my research experiences, I have also received multiple teaching awards at her university including most recently the 2016 Outstanding Graduate Teaching Award. This substantiates my commitment to and expertise in the dissemination of advances in statistics to both applied and methodological researchers. My methodological research could contribute to applied work in each of the PRC's primary research areas, including: Population Health; Family Demography and Intergenerational Relationships; and particularly the Education, Work, and Inequality area. My work has benefited greatly from the connections I have been able to forge with applied and methodological researchers whom I have met through my affiliation with the PRC.

B. Positions and Honors

Positions and Employment
2000-2006	Assistant Professor, Educational Psychology Department (EDP), University of Texas, Austin
2006-2012	Associate Professor, EDP, UT
2011-Present	Faculty Research Associate, Population Research Center, UT
2012-2013	Graduate Advisor, Masters in Mathematics/Statistics program, UT
2012-Present	Member, Board of Directors, Meadows Center for Preventing Educational Risk, UT
2012-Present	Professor, EDP, UT
2013-2016	Associate Dean for Research & Graduate Studies, College of Education, UT
2014-Present	John L. and Elizabeth G. Hill Centennial Professorship, EDP, UT

Other Experience and Professional Memberships

1996-	Member, American Educational Research Association
2004	Program Chair, Hierarchical Linear Modeling special interest group, AERA
2006,2007	Program Chair, Educational Statisticians special interest group, AERA
2007-2008	Program Co-chair, National Council of Measurement in Education annual meeting
2008-2016	Member, Institute of Education Sciences peer review panels
2011-2013	Program co-Chair, AERA-Division D2-Quantitative Methods and Statistical Theory
2011,2012	Instructor, AERA Faculty Institute for the Teaching of Statistics with Large-Scale Data Sets, Stanford University
2011-2012	Associate Editor, *Journal of Educational Psychology*
2011-2013	Associate Editor, *Journal of School Psychology*
2013	Founder, TX Universities' Educational Statistics and Psychometrics annual meeting
2013-2014	Member, NAEP Design and Analysis committee
2013-Present	Member, Society for Research Synthesis Methodology
2014, 2015	Ad hoc reviewer, NSF Methodology, Measurement and Statistics panel
2015-Present	Member, Single-Case Design advisory committee for What Works Clearinghouse
2017-Present	Co-Editor in Chief, *Research Synthesis Methods*

Honors

2009	Recipient, UT Regents' Outstanding teaching award for undergraduate teaching.
2013	Office of Students with Disabilities Recognition, UT-Austin
2014	Recipient, College of Education Dean's Distinguished Teaching Award
2016	Recipient, University Co-op Outstanding Graduate Teaching Award

C. Contributions to Science

Ignoring Cross-Classification and Multiple-Membership Data Structures in Clustered Data Analyses.
There are a number of methods for handling dependence of individuals within contexts (like classrooms, schools, hospitals, clinics, etc.). It is critical to appropriately model the contexts leading to dependency in individuals' data. For example, educational outcomes for students in the same school looks more like that of fellow students in the same school than like that of students in other schools. Use of the conventional multilevel model offers one way for applied researchers to capture that dependence and appropriately model the resulting variability. However, when participants change contexts (e.g., students change schools), it is also important to capture the resulting complex data structure. Use of cross-classified and multiple-membership random effects models offer researchers a way to appropriately model the resulting data structure complexity. Using real data and simulation studies I have conducted research that emphasizes the impact of ignoring this kind of complexity in data.

- Wolff Smith, L. J., & **Beretvas, S. N.** (2016). A comparison of techniques for handling and assessing the influence of mobility on student achievement. *Journal of Experimental Education*. DOI**:** 10.1080/00220973.2015.1065217
- Chung, H., & **Beretvas, S. N.** (2012). The impact of ignoring multiple-membership data structures in multilevel models. *British Journal of Mathematical and Statistical Psychology*, *65*, 185-200.
- Grady, M., & **Beretvas, S. N.** (2010). Incorporating student mobility in achievement growth modeling: A cross-classified multiple membership growth curve model. *Multivariate Behavioral Research, 45*, 393-419.
- Meyers, J. L., & **Beretvas, S. N.** (2006). The impact of inappropriate modeling of cross-classified data structures. *Multivariate Behavioral Research, 41*, 473-497.

Advances in Multilevel Modeling. In addition to demonstrating the impact of ignoring cross-classified and multiple-membership data structures, my research has focused on evaluating estimation of and demonstrating extensions to the conventional multilevel model. These extensions have included handling parallel process data for capturing relationships between trajectory parameters for repeated measures on both the individual (e.g., student) and their cluster (e.g., teacher), testing estimation of a more flexible version of the cross-classified random effects model that allows cross-classified factors' residuals to covary, and handling measurement error in addition to the complex data structures. I submitted a Statistical and Research Methodology in Education grant to the Institute of Education Sciences (IES) which focused on several of these

advances and if funded should lead to software products intended to support applied researchers' use and understanding of these advances.

- Harring, J. R., Stapleton, L. M., & **Beretvas, S. N.** (Eds.). (2015). *Advances in multilevel modeling for educational research: Addressing practical issues found in real-world applications*. Charlotte, NC: Information Age Publishing, Inc.
- Harring, J., **Beretvas, S. N.**, & Israni, A. (2015). A model for cross-classified nested repeated measures data. In J. R. Harring, L. M. Stapleton & **S. N. Beretvas** (Eds.), *Advances in multilevel modeling for educational research: Addressing practical issues found in real-world applications* (pp. 229-260). Charlotte, NC: Information Age Publishing, Inc.
- Israni, A., & **Beretvas, S. N.** (2016, April). *Bayesian Estimation of a Second-Order Parallel Process Latent Growth Model*. Paper presented at the annual meeting of the American Education Research Association, Washington, DC.
- Kaplan, A., & **Beretvas, S. N.** (2014). *Estimation of extensions to the multiple-membership and cross-classified random effects models*. Paper presented at the annual meeting of the American Educational Research Association, Philadelphia, Pennsylvania.

Pedagogical Resources for Applied Researchers. I have also authored several chapters intended to help translate methodological innovations for applied researchers. These offer resources that explain methodological challenges and dilemmas as well as their solutions using applied examples along with commented code in some of the chapters.

- **Beretvas, S. N.** (2015). Uncovering processes and pathways in family-school research: Modeling innovations for handling data complexities. In S. M. Sheridan & E. M. Kim (Eds.) *Research on family-school partnerships: An interdisciplinary examination of state of the science and critical needs (Volume II: Processes and pathways of family-school partnerships)* (pp. 81-99). New York, NY: Springer.
- **Beretvas, S. N.**, Whittaker, T. A., & Stafford, R. E. (2014). Statistical modeling methods for classroom management research. Chapter in E. T. Emmer & E. Sabornie (Eds.) *Handbook of classroom management* (pp. 519-537).
- **Beretvas, S. N.**, Keith, T. Z., & Carlson, C. (2010). Methodological issues in family-school partnership research. In S. L. Christenson & A. L. Reschly (Eds.). *The Handbook of School-Family Partnerships for Promoting Student Competence* (pp. 420-447), New York, NY: Routledge.
- **Beretvas, S. N.** (2010). Cross-classified and multiple membership models. In J. Hox & J. K. Roberts (Eds.), *The handbook of advanced multilevel analysis* (pp. 313-334). New York, NY: Routledge.

Quantitative Meta-Analysis. Given the increasing focus on evidence-based practice, researchers are increasingly turning to meta-analysis which allows synthesis of results from related studies. As more information is reported in online articles and associated online appendices, more data is available and can be synthesized. This introduces more complexities into the associated synthesis and the field of methodology for quantitative meta-analysis continues to extend the associated techniques. A new addition to the field of meta-analysis involves the formulation of effect sizes and their synthesis for single-case experimental design (SCED) research studies. I am contributing to both group-comparison experimental design (more conventional meta-analysis) and SCED meta-analysis. For SCED meta-analysis, I am in the second year of an IES grant focused on methods for SCED meta-analysis on which I'm collaborating with colleagues from other universities. In the interest of disseminating some of this recent work (advances in both group-comparison and SCED meta-analysis), I also just submitted a proposal for a book focused on Quantitative Meta-Analysis.

- **Beretvas, S. N.** (2010). Meta-analysis. In G. R. Hancock & R. Mueller (Eds.) *Quantitative Methods in the Social and Behavioral Sciences: A Guide for Researchers and Reviewers* (pp. 255-263). New York: NY: Routledge.
- Hembry, I., Bunuan, R., **Beretvas, S. N.**, & Ferron, J. M., Van Den Noortgate, W. (2015). Estimation of a nonlinear intervention phase trajectory for multiple baseline design data. *Journal of Experimental Education, 83*, 514-546. DOI: 10.1080/00220973.2014.907231

- Beretvas, S. N., & Chung, H. (2008). An evaluation of modified change-in-R^2 effect size indices for single-subject experimental designs. *Evidence-Based Communication Assessment and Intervention, 2*, 120-128.
- **Beretvas, S. N.**, & Chung, H. (2008). A review of meta-analyses of single-subject experimental designs: Methodological issues and practice. *Evidence-Based Communication Assessment and Intervention, 2*, 129-141.

Multilevel Measurement Model Research. Total or mean scores on surveys or questionnaires provide estimates of constructs that include measurement error. Appropriate modeling of this measurement error permits more accurate estimation of relationships among the relevant constructs. A number of modeling frameworks have been suggested for separating out measurement error from analyses of relationships among constructs. Recently use of the multilevel modeling framework has been suggested. Use of this framework allows partitioning of measurement error separately from true scores as well as handling of complex data structure. I have continued to contribute to research in this area tying together my work on models for handling complex data structures with use of this framework for handling measurement error.

- **Beretvas, S. N.**, Murphy, D. L., & Gaertner, M. N. (2015). Cross-classified random effects models for assessing rater severity and differential rater functioning. In J. Harring, L. M. Stapleton and **S. N. Beretvas** (Eds.) *Advances in multilevel modeling for educational research: Addressing practical issues found in real-world applications.* Charlotte, NC: Information Age Publishing, Inc.
- **Beretvas, S. N.**, & Walker, C. M. (2012). Distinguishing differential testlet functioning from differential bundle functioning using the multilevel measurement model. *Educational and Psychological Measurement, 72*, 200-223.
- **Beretvas, S. N.**, Meyers, J. L., Rodriguez, R. A. (2007). The cross-classified multilevel measurement model: An explanation and demonstration. In E. Smith & R. Smith (Eds.) *Rasch Measurement: Advanced and Specialized Applications* (pp. 405-434), JAM Press.
- **Beretvas, S. N.**, Cawthon, S. W., Lockhart, L. L., & Kaye, A. D. (2012). Assessing impact, DIF, and DFF in accommodated item scores: A comparison of multilevel measurement model parameterizations. *Educational and Psychological Measurement*, *72*, 754-773.

D. Research Support

Ongoing Research Support
R305A160027 (E. Patall, PI)   09/01/16-08/31/18
Institute of Education Sciences
Research Synthesis of the Effects of Classroom Structure on Student Motivation, Engagement, and Achievement
This quantitative meta-analysis will synthesize research focused on the effects of classroom structure on multiple student outcomes including the broad categories of motivation, engagement and achievement. The study will investigate potential heterogeneity in effects using a set of student, setting and study moderators.
Role: Co-Principal Investigator
Responsibilities: Consult about coding of variables, conduct quantitative synthesis and meta-regression analyses and assist with dissemination of results in conference presentations and publications and with composition of grant reports.

R305D150007 (W. Van Den Noortgate, PI)   08/01/15-07/31/18
Institute of Education Sciences
Multilevel Modeling of Single-Subject Experimental Data: Handling Data and Design Complexities
This methodological grant supports further collaboration by me and my graduate research assistants (GRAs) at UT with Dr. John Ferron and his GRA at the University of South Florida and with Dr. Wim van den Noortgate and his GRAs at the University of Leuven in Belgium. In this work we are exploring further extensions to the multilevel modeling framework for conducting quantitative meta-analysis of SCED studies' results when we recognize additional, concurrent complexities not investigated in the first grant. This work includes real syntheses of SCED studies as well as simulation work assessing estimation of extensions to the multilevel model.
Role: Co-Principal Investigator

Responsibilities: Design and implement studies being conducted at UT, oversee work of GRAs, communicate monthly with co-PIs at other institutions, provide feedback on each other's research, handle local administration of grant, and assist with dissemination of results in conference presentations and publications and with composition of grant reports.

Completed Research Support

R305D110024 (W. Van Den Noortgate, PI)   07/01/11-06/30/14
Institute of Education Sciences
Multilevel synthesis of single-case experimental data: Further developments and empirical validation
This methodological grant supported collaboration by me and my graduate research assistants (GRAs) at UT with Dr. John Ferron and his GRA at the University of South Florida and with Dr. Wim van den Noortgate and his GRAs at the University of Leuven in Belgium. In this work we investigated use of the multilevel modeling framework for conducting quantitative meta-analysis of SCED studies' results. This work included real syntheses of SCED studies as well as simulation work that assessed estimation of effect sizes and moderators thereof.
Role: Co-Principal Investigator
Responsibilities: I designed and implemented studies being conducted at UT, oversaw the work of the GRAs, communicated monthly with co-PIs at the other institutions, provided feedback on each other's research, handled local administration of grant, and assisted with dissemination of results in conference presentations and publications and with composition of grant reports.

R305A120144 (S. Sheridan, PI)   06/01/12-05/31/14
Institute of Education Sciences
A meta-analysis of parent involvement interventions and family-school partnerships' effects on student outcomes
This quantitative meta-analysis involved synthesizing research focused on the effects of parent involvement and family-school partnership interventions on both academic and non-academic student outcomes. The study investigated potential sources of heterogeneity in the effects using student, setting and study moderator variables. We gathered both group comparison and SCED studies' results.
Role: Co-Principal Investigator
Responsibilities: I consulted with my fellow researchers to help create the database system used to gather data, consulted with them about coding of variables, I directed the UT GRA's work and we conducted all quantitative syntheses and meta-regression analyses, and assisted with dissemination of results in conference presentations and publications and with composition of grant reports.