Kilchan Choi

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Education

1992 B.A., Education, College of Education, Seoul National University

1995 M.A., Educational Measurement and Evaluation, College of Education, Seoul National University

2002 Ph. D., Advanced Quantitative Methodology in Social Research Methodology Division, Graduate School of Education and Information Studies, University of California, Los Angeles

Professional Experience

Assistant Director, Principal Scientist in Statistical and Methodological Innovations, National Center for Research on Evaluation, Standards and Student Testing (CRESST), University of California (2013–present)

Serving as the Assistant Director and, Dr. Choi plan and oversee all statistical and methodological activities at the Center. Dr. Choi also serves as lead quality control for all Center products in terms of research design/methodology, statistical analysis, and quantitative reporting, including project planning, reports, proposals, and other Center dissemination activities. He develops long-term vision and goals to establish priorities for new and innovative approaches and techniques for design/methodology and statistical analysis, and oversee their implementation by Center staff. He currently provide intellectual leadership Center-wide on innovative approaches to statistical analysis, psychometrics, and research methodology, as well as for identifying new/emerging areas and topics for R & D. Building connections between existing CRESST work and new/emerging approaches in statistics and research methodology, he leads innovative research programs and projects in these arenas.

Principal Researcher, Division of Education, Human Development, and the Workforce, AIR (2010–2013)

Dr. Choi develops and applies statistical models to analyze changes in student achievement over time and links these changes to characteristics of students, teachers, and schools. As part of his work, Dr. Choi develops new models that extend existing value-added models to estimate new types of effects and also make the computation of these models more efficient. In addition to conducting original research under a current grant from the Institute of Education Sciences, Dr. Choi works on projects that use data from individual states and large school districts to estimate value-added models using data from their assessment systems. These projects include the Baltimore City School District Development of value-added measures project and New York State Education Department growth and value-added measures of teacher and principal effectiveness project. Dr. Choi also works on an Institute for Education Sciences- (IES) funded research project, “Identifying potentially successful approaches to turning around chronically low-performing schools.” He provided innovative statistical models to identify low-performing schools and turning-around schools.

Project Director: Teacher Effect Change Model: Latent Variable Regression in 5-Level Hierarchical Model, IES (2008–2010)

This project attempts to develop a new statistical model for estimating teacher effects over time. This model specifies a five-level latent variable regression hierarchical model (LVR-HM5) that addresses the following questions: Do teacher effect estimates change over time? What do the teacher effect profile trajectories look like? To what extent do teachers’ background characteristics relate to the teacher effect profile trajectories? These kinds of questions require that an individual teacher effect be estimated each year by the magnitude of gain/growth students made per year and that such teacher effects in multiple years yield an individual teacher effect profile. Statistically speaking, this model specifies double gain/growth processes, both of students and of teachers. In addition, it includes student, teacher, and school-level variables, especially students’ initial status through latent variable regression within a hierarchical modeling framework. Note that this model is computationally much less demanding compared with current sophisticated value-added models. The results of this model were presented at the annual IES research conference in 2009 and 2010.

Project Director: Value-Added Model Estimates for Multiple-Cohort Longitudinal Data Using Different Performance Indicators, IES (2007–2008)

This project explores a new value-added model using multiple-cohort longitudinal data. This kind of data set has a four-level hierarchical structure: time-series observation nested within students who are nested within different cohorts of students. These students are in turn nested within a school. Under these circumstances, this model attempts to estimate three performance indicators: initial status, growth rate, and equity indicator across different cohorts. Specifically, one can see a longitudinal pattern of where each cohort of students within a school starts, how much it gains/grows within a specific time period, and how much the initial gap between initially low-performing students and initially high-performing students gets magnified or diminished. As such, this model, as distinguished from the current value-added models, provides us with a more comprehensive picture of student growth over time and the distribution of student growth within a school across cohorts. The results of this model were presented at the annual IES research conference in 2008.

Project Director: Monitoring School Improvement Over Years, Using a Hierarchical Model Under a Multiple-Cohorts Design: Comparing Scale Score to Normal Curve Equivalent (NCE) Results (2003–2005)

This project examined the effect that the choice of the metric has on inferences about school performance when using a multiple-cohort school productivity model as a basis for such inferences. Given the increased focus on school improvement over time and both the modeling and metric options available with which to conduct analyses, it is important to consider whether the choice of metric statistically or substantively affects decisions related to the assessment of school quality over time.

Professional History

1992-1995 Graduate Student Researcher, Educational Research Institute, College of Education, Seoul National University

1995-1996 Researcher, Educational Research Institute, College of Education, Seoul National University

1996-2002 Graduate Student Research, National Center for Research on Evaluation, Standards and Student Testing (CRESST), University of California, Los Angles,

2002-2010 Senior Research, National Center for Research on Evaluation, Standards and Student Testing (CRESST), University of California, Los Angeles

2010-2013 Principal Researcher, American Institutes for Research

2013- Assistant Director and Principal Scientist in Statistical and Methodological Innovations, National Center for Research on Evaluation, Standards and Student Testing (CRESST), University of California, Los Angeles

Honors and Awards

Leigh Burstein Methodology Award, Social Research Methodology Division, Graduate School of Education and Information Studies, UCLA, 2001  
Department Fellowship, Graduate School of Education and Information Studies, UCLA, 1996–2001  
B.A. with distinction, Seoul National University, South Korea, 1992

Publications

Choi, K. (2001). Latent variable modeling in the hierarchical modeling framework in longitudinal studies: A fully Bayesian approach*. Asia Pacific Education Review, 2*(1), 44–55.

Seltzer, M., Novak, J., Choi, K., & Lim, N. (2002). Sensitivity analysis for hierarchical models employing *t* level-1 assumptions. *Journal of Educational and Behavioral Statistics*, *27*, 181–222.

Seltzer, M., Choi, K., & Thum, Y. M. (2003). Examining relationships between where students start and how rapidly they progress: Using new developments in growth modeling to gain insight into the distribution of achievement within schools*. Educational Evaluation and Policy Analysis*, *25*(3), 263–286.

Choi, K., Goldschmidt, P., & Yamashiro, K. (2005). Exploring models of school performance: from theory to practice. In J. Herman & E. Haertel (Eds.), *Data use and misuse*. The 104th Yearbook of the National Society of Study of Evaluation. Malden, MA: Blackwell.

Goldschmidt, P., Roschewski, P., Choi, K., Auty, W., Blank, R., & Williams, A. (2006). *Policymaker’s guide to growth models for school accountability: How do accountability models differ?* Washington, DC: Council of Chief State School Officers.

Choi, K. (2006). *Growth-based school accountability systems: Key issues and suggestions.* Washington, DC: U.S. Department of Education invited paper.

Choi, K., Seltzer, M., Herman, J., & Yamashiro, K. (2007). Children left behind in AYP and non-AYP schools: Using student progress and the distribution of student gains to validate AYP. *Educational Measurement: Issues and Practice*, *26*(3), 21–32.

Kim, J., & Choi, K. (2008). Closing the gap: modeling within school heterogeneity in school effect study*. Asia Pacific Education Review*, 9(2), 206–220.

Goldschmidt, P., Choi, K., Martinez, F., & Novak, J. (2010). Using growth models to monitor school performance: Comparing the effect of the metric and the assessment. *School Effectiveness and School Improvement*, *21*(3), 337–357.

Choi, K. (2010). Latent variable regression 3-level hierarchical model using 2 time-point longitudinal data for monitoring school performance. *Asian Journal of Education*, *11*(2), 163–177.

Choi, K., & Kim, S. (2010). Monitoring school performance based on national level achievement test. *Journal of Education Evaluation and Curriculum*, *13*(2), 175–195.

Choi, K., & Seltzer, M. (2010). Modeling heterogeneity in relationships between initial status and rates of change: Treating latent variable regression coefficients as random coefficients in a three-level hierarchical model. *Journal of Educational and Behavioral Statistics, 35*(1), 54–91.

Phelan, J., Choi, K., Herman, J., & Baker, E. (2011). Differential improvement in student understanding of mathematical principles following formative assessment intervention. *Journal of Educational Research*, *104*(5), 330–339.

Baker, E., Griffin, N., & Choi, K. (2012). The achievement gap in California and beyond context, status, and approaches for improvement. In T. B. Timar & J. Maxwell-Jolly (Eds.), *Closing the achievement gap* (pp. 77–94). Cambridge: Harvard Education Press.

Goldschmidt, P., Choi, K., & Beaudoin, J. P. (2012). *Growth model comparison study: Practical implications of alternative models for evaluating school performance*. Washington, DC: The Council of Chief State School Officers (CCSSO).

Choi, K., & Goldschmidt, P. (2012). A multilevel growth curve approach to predicting student proficiency. *Asia Pacific Education Review.* 13(2), 199-208.

Phelan, J., Choi, K., Herman, J., & Baker, E. (2012). The effect of Powersource assessment on middle school students’ math performance. *Assessment in Education: Principles, Policy, & Practice.* 19(2),211-230.

Cai, L., Choi, K., & Kuhfeld, M. (in press). On the role of multilevel item response models in multi-site evaluation studies for serious games. In H. F. O’Neil, E. L. Baker, & R. Perez (Eds.), *Issues regarding the use of games and simulations for teaching and assessment.* New York: Taylor & Francis.

Cai, L., Choi, K., Hansen, M., & Harrell ,L. (2016). Item response theory. *Annual Review of Statistics and Its Applications, 12*(3), 1–25.

Research Reports

Seltzer, M., Choi, K., & Thum, Y. (2002). *Examining relationships between where students start and how rapidly they progress: Implications for constructing indicators that help illuminate the distribution of achievement within schools*. (CSE Tech. Rep. No. 560). Los Angeles: University of California, Center for Research on Evaluation, Standards, and Student Testing.

Seltzer, M., Choi, K., & Thum, Y. (2002). *Latent variable modeling in the hierarchical modeling framework: Exploring initial status × treatment interactions in longitudinal studies of intervention.* (CSE Tech. Rep. No. 559). Los Angeles: University of California, Center for Research on Evaluation, Standards, and Student Testing.

Choi, K., & Seltzer, M. (2003). *Addressing Questions Concerning Equity in Longitudinal Studies of School Effectiveness and Accountability: Modeling Heterogeneity in Relationships between Initial Status and Rates of Change*. (CSE Tech. Rep. No. 614). Los Angeles: University of California, Center for Research on Evaluation, Standards, and Student Testing.

Choi, K., & Shin, E. (2004). *What are the chances of getting into a UC school? A look at the course-taking patterns of high school students for UC admissions eligibility.* (CSE Tech. Rep. No. 623). Los Angeles: University of California, Center for Research on Evaluation, Standards, and Student Testing.

Goldschmidt, P., Choi, K., & Martinez, F. (2004). *Using hierarchical growth models to monitor school performance over time: comparing NCE to scale score results.* (CSE Tech. Rep. No. 618). Los Angeles: University of California, Center for Research on Evaluation, Standards, and Student Testing.

Choi, K., & Seltzer, M., Herman, J., & Yamashiro, K. (2004). *Children Left Behind in AYP and Non-AYP Schools: Using Student Progress and the Distribution of Student Gains to Validate AYP*. (CSE Tech. Rep. No. 637). Los Angeles: University of California, Center for Research on Evaluation, Standards, and Student Testing.

Choi, K., & Herman, J. (2005*). Seattle School District effect of expository writing and science notebook program: using existing data to explore program effects on students’ science learning evaluation of Seattle Public Schools’*. (Report to the Seattle School District commissioned by the Stuart Foundation). Los Angeles: University of California, National Center for Research on Evaluation, Standards, and Student Testing.

Choi, K., & Seltzer, M. (2005). *Modeling Heterogeneity in Relationships between Initial Status and Rates of Change: Latent Variable Regression in a Three-Level Hierarchical Model*. (CSE Tech. Rep. No. 647). Los Angeles: University of California, Center for Research on Evaluation, Standards, and Student Testing.

Goldschmidt, P., Roschewski, P, Choi, K., Auty, W., Blank, R., & Williams, A. (2006). *Policymaker’s guide to growth models for school accountability: how to accountability model differ?* The Council of Chief State School Officers. Washington, D.C.

Choi, K. (2006). *Growth-based school accountability systems: Key issues and suggestions*. (Report to the U.S. Department of Education). Los Angeles: University of California, National Center for Research on Evaluation, Standards, and Student Testing.

Choi, K., & Kim, J. (2006). *Closing the gap: modeling within school heterogeneity in school effect study.* (CSE Tech. Rep. No. 689). Los Angeles: University of California, Center for Research on Evaluation, Standards, and Student Testing.

Baker, E. L., Ayres, P., O’Neil, H. F., Choi, K., Tetty, M., & Sylvester, R. M. (2006, December). *KS3 Mathematics Marker Study in Australia: Report to the National Assessment Agency of England.* Sherman Oaks, CA: Advance Design Information.

Baker, E. L., Ayres, P., O’Neil, H. F., Choi, K., Tetty, M., & Sylvester, R. M. (2007, March). *KS3 Mathematics Marker Study in Australia: Report to the National Assessment Agency of England.* Sherman Oaks, CA: Advance Design Information.

Baker, E., Kim, K.S., & Choi, K. (2007). *Accountability in supporting student learning: scaling up use of educational innovations, and simulations and transfer for problem solving knowledge and skills*. (Report to the Korean Presidential Committee of Educational Innovation). Sherman Oaks, CA: Advance Design Information.

Goldschmidt, P., & Choi, K. (2007). *The practical benefits of growth models for accountability and the limitations under NCLB.* Policy Brief 9, Spring, 2007. Los Angeles: University of California, Center for Research on Evaluation, Standards, and Student Testing.

Herman, J., & Choi, K. (2008). Formative assessment and the improvement in middle school science learning: the role of teacher accuracy. (CSE Tech. Rep. No. 740). Los Angeles: University of California, Center for Research on Evaluation, Standards, and Student Testing.

Phalen, J., Kang, T., Niemi, D., Vendlinkski, T., & Choi, K. (2009). Some aspects of technical quality of formative assessment in middle school mathematics. (CSE Tech. Rep. No. 750). Los Angeles: University of California, Center for Research on Evaluation, Standards, and Student Testing.

Phelan, J., Vendlinski, T., Choi, K., Herman, J., & Baker, E.L. (2011). The development and impact of POWERSOURCE©: Year 3. (CRESST Report 793). Los Angeles, CA: University of California, National Center for Research on Evaluation, Standards, and Student Testing (CRESST).

Phalen, J., Vendlinkski, T., Choi, K., Dai, Y., Herman, J., & Baker, E. (2011). The development and impact of POWERSOURCE©: Year 5. (CSE Tech. Rep. No. 792). Los Angeles: University of California, Center for Research on Evaluation, Standards, and Student Testing.

Herman, J. & Choi, K. (2012). Validation of ELA and mathematics assessment: A general approach. CSE Policy Brief, July, 2012. Los Angeles: University of California, Center for Research on Evaluation, Standards, and Student Testing.

Chung, G. K. W. K., Choi, K.,Baker, E. L., & Cai, L. (2014). *The effects of math video games on learning: A randomized evaluation study with innovative impact estimation techniques* (CRESST Report 841). Los Angeles, CA: University of California, National Center for Research on Evaluation, Standards, and Student Testing (CRESST).

Monroe, S., Cai, L., & Choi, K. (2014). *Student growth percentiles based on MIRT: Implications of calibrated projection.* (CRESST Report 842). Los Angeles, CA: University of California, National Center for Research on Evaluation, Standards, and Student Testing (CRESST).

Herman, J., Matrundola, D., Epstein, S., Leon, S., Dai, Y., Reber, S., & Choi, K. (2015). *The implementation and effects of the Mathematics Design Collaborative (MDC): Early findings from Kentucky ninth-grade Algebra 1 Courses* (CRESST Report 845). Los Angeles, CA: University of California, National Center for Research on Evaluation, Standards, and Student Testing (CRESST).

Herman, J., Epstein, S., Leon, S., Dai, Y., Matrundola, D., Reber, S., & Choi, K. (2015). *The implementation and effects of the Literacy Design Collaborative (LDC): Early findings in sixth-grade Advanced Reading Courses* (CRESST Report 846). Los Angeles, CA: University of California, National Center for Research on Evaluation, Standards, and Student Testing (CRESST).

Brown, S. R., & Choi, K. (2015). *Measuring the causal effect of the National Math + Science Initiative’s College Readiness Program.* (CRESST Report 847). Los Angeles, CA: University of California, National Center for Research on Evaluation, Standards, and Student Testing (CRESST).

Herman, J., Epstein, S., Leon, S., Dai, Y., Matrundola, D., Reber, S., & Choi, K. (2015). *The implementation and effects of the Literacy Design Collaborative (LDC): Early findings in eight-grade History/Social Studies and Science Courses* (CRESST Report 848). Los Angeles, CA: University of California, National Center for Research on Evaluation, Standards, and Student Testing (CRESST).

**Teaching Experience**

April, 2003 Co-Instructor

Title: An Introduction to the Use of WinBUGS in Applications of Hierarchical Models in Educational Research

Professional Development and Training Course at the Annual Meeting of the American Educational Research Association, Chicago

August, 2003 Pre-conference Training Course

Title: Applications of Hierarchical Modeling in Educational Research: Focusing on Growth Modeling and Studies on School Effectiveness”

4th International Conference on Educational Research, Educational Research Institute, Seoul National University, Seoul, 2003

Fall, 2007 Instructor

Course title: Advanced quantitative in non-experimental research: Multilevel analysis”

Graduate School of Education and Information Studies, UCLA.

Sprint, 2007 Instructor

Course title: Linear statistical models in social science research: analysis of designed experiments.

Graduate School of Education and Information Studies, UCLA.

**Funded Research Support**

2006 – 2007 Korean Presidential Educational Innovation Committee

Title: Accountability in supporting student learning: scaling up use of educational innovations, and simulations and transfer for problem solving knowledge and skills

PI (total award $ 30,000)

2007 – 2009 Institute of Education Sciences,(IES).

Title: 4-Level/5-Level Hierarchical Model for Experimental, Quasi-Experimental Studies and Teacher and/or School Accountability

Co-PI (Eva Baker, PI, $720,000 total award)

2014 – 2015 Institute of Education Sciences,(IES).

Title: Novel models and methods to address measurement error issues in educational assessment and evaluation studies

Co-PI (Li Cai, PI, total award $895,108)

Professional Activities

Affiliations

American Educational Research Association  
National Council on Measurement in Education

**Grant Proposal Review Service**:

Institute of Education Sciences (Principal member of Cognitive and Learning Basic Process II Panel member, 2009 – present)

Institute of Education Sciences (Statistics/ Modeling Grant Review Panel member. 2008)

Institute of Education Sciences (grant proposal reviewer, 2007, 2008)

**Editorial Services:**

Editorial Board Member, American Educational Research Journal (2013 – 2015)

Editorial Board Member, Educational Assessment (2014 – present)

Editorial Board Member, Journal of Educational and Behavioral Statistics (2015 – present)

Reviewer for Journal of Educational Psychology (1998),

British Journal of Educational Psychology (1999),

Educational Assessment (2002, 2003, 2005, 2006, 2013),

Psychological Methods (2007, 2008),

Journal of Developmental Psychology (2008),

American Journal of Evaluation (2008),

Educational Evaluation and Policy Analysis (2008),

Educational Measurement: Issues and Practice (2008),

American Educational Research Journal (2009),

Multivariate Behavioral Research (2013, 2014)

Journal of Research on Educational Effectiveness (2013, 2014)