

Justin Kern

University of California, Merced
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Education

Ph.D. Psychology, University of Illinois at Urbana-Champaign, August 2017.

Dissertation title: Using response times in CAT

Dissertation Advisor: Hua-Hua Chang

M.A. Psychology, University of Illinois at Urbana-Champaign, May 2013.

Thesis Title: Comparison of Parafac2 and Tucker3 models using multiple personality data

Thesis Advisor: Sungjin Hong

M.S. Statistics, University of Illinois at Urbana-Champaign, May 2012.

B.S. Psychology and Mathematics, Central Michigan University, May 2009.

Honors: Magna Cum Laude

Employment History

University of California, Merced, Department of Psychology

Visiting Assistant Professor of Quantitative Psychology, July 2017–Present

Research Interests

Psychometrics, statistics, and measurement, specifically:

Item response theory

Item response time modeling

Computerized adaptive testing

Structural equation modeling

Ideal point modeling

N -way component models

Measurement equivalence

Model estimation techniques

Academic Experience

University of Illinois at Urbana-Champaign, Department of Psychology

Teaching Assistant (Instructor), PSYC 235, Introduction to Statistics, Y. Michelle Wang, Spring 2017.

Teaching Assistant (Instructor), PSYC 235, Introduction to Statistics, Y. Michelle Wang, Fall 2016.

Teaching Assistant (Instructor), PSYC 235, Introduction to Statistics, Michel Regenwetter, Spring 2016.

Teaching Assistant, PSYC 587, Hierarchical Linear Models, Carolyn Anderson, Fall 2015.

Teaching Assistant, PSYC 588, Covariance Structure and Factor Models, Steven Culpepper, Spring 2015.

Teaching Assistant (Lab), PSYC 490, Measurement and Test Development Lab, Hua-Hua Chang, Fall 2014.

Teaching Assistant, PSYC 588, Covariance Structure and Factor Models, Steven Culpepper, Spring 2014.

Teaching Assistant, PSYC 594, Multivariate Analysis in Psychology and Education, Lawrence Hubert, Fall 2013.

Teaching Assistant (Lab), PSYC 235, Introduction to Statistics, Michel Regenwetter, Spring 2013.

Teaching Assistant (Lab), PSYC 301, Psychological Statistics, Hans-Friedrich Köhn, Fall 2012.

Teaching Assistant (Instructor), PSYC 235, Introduction to Statistics, Michel Regenwetter, Spring 2012.

Teaching Assistant (Instructor), PSYC 235, Introduction to Statistics, Michel Regenwetter, Fall 2011.

Teaching Assistant (Lab), PSYC 301, Psychological Statistics, Sungjin Hong, Spring 2011.

Teaching Assistant (Lab), PSYC 235, Introduction to Statistics, Y. Michelle Wang, Spring 2010.

Teaching Assistant (Lab), PSYC 301, Psychological Statistics, Sungjin Hong, Fall 2009.

Central Michigan University, Department of Psychology

Undergraduate Research Assistant, Bryan Gibson, Spring 2008–Spring 2009.

Undergraduate Teaching Assistant, Nicholas Dey, Fall 2007.

Honors, Awards, & Fellowships

Hobson Fellowship, University of Illinois at Urbana-Champaign, 2014.

Jeffrey Tanaka Memorial Award, Spring 2014.

List of Teachers Ranked as Excellent by Their Students, University of Illinois at Urbana-Champaign, Spring 2011.

Graduate College Diversity Fellowship, University of Illinois at Urbana-Champaign, 2010.

Graduate College Diversity Fellowship, University of Illinois at Urbana-Champaign, 2009.

Summer Pre-Doctoral Institute Diversity Fellowship, University of Illinois at Urbana-Champaign, 2009.

Dean's List, Central Michigan University, 2005–2009.

Publications

- Choe, E. M., **Kern, J. L.**, and Chang, H.-H. (Accepted). Optimizing the use of response times for item selection in CAT. *Journal of Educational and Behavioral Statistics*.
- Kern, J. L.** (2017). On the relationship between Procrustes analysis and bidimensional regression. *Journal of Classification*, 34(1), 35–48. doi: 10.1007/s00357-017-9224-z
- Kern, J. L.** and Culpepper, S. A. (2017). [Review of the book *Analyzing spatial models of choice and judgment with R*, by D. A. Armstrong II, R. Bakker, R. Carroll, C. Hare, K. T. Poole, & H. Rosenthal]. *Journal of Educational and Behavioral Statistics*, 42(2), 243–247. doi: 10.3102/1076998616673020
- McBride, B. A., Curtiss, S. J., Uchima, K., Laxman, D. J., Santos, R. M., Weglarz-Ward, J., Dyer, W. J., Jeans, L. M., and **Kern, J. L.** (2017). Father involvement in early intervention: Exploring the gap between service providers' perceptions and practices. *Journal of Early Intervention*. Advance online publication. doi: 10.1177/1053815116686118
- Hur, J., Heller, W., **Kern, J. L.**, and Berenbaum, H. (2016). A bi-factor approach to modeling the structure of worry and rumination. *Journal of Experimental Psychopathology*. doi: 10.5127/jep.057116
- Kern, J. L.**, McBride, B. A., Laxman, D. J., Dyer, W. J., Santos, R. M., and Jeans, L. M. (2016). The role of multiple-group measurement invariance in family psychology research. *Journal of Family Psychology*, 30(3), 364–374. doi: 10.1037/fam000184
- Kern, J. L.** (2015). [Review of the book *Advancing methodologies to support both summative and formative assessments*, by Y. Cheng & H.-H. Chang]. *Applied Psychological Measurement*, 39(7), 575–578. doi: 10.1177/0146621615595498
- Laxman, D. J., McBride, B. A., Jeans, L. M., Dyer, W. J., Santos, R. M., **Kern, J. L.**, Sugimura, N., Curtiss, S. L., and Weglarz-Ward, J. (2015). Father involvement and maternal depressive symptoms in families of children with disabilities or delays. *Maternal and Child Health Journal*, 19(5), 1078–1086. doi: 10.1007/s10995-014-1608-7

Submitted Manuscripts

- Culpepper, S. A., and **Kern, J. L.** (Submitted). A general class of conjunctive models: Bayesian formulation and applications.
- McBride, B. A., Laxman, D. J., Santos, R. M., Dyer, W. J., Jeans, L. M., **Kern, J. L.**, and Weglarz-Ward, J. (Submitted). Father involvement and school readiness of children with disabilities.
- Culpepper, S. A., Aguinas, H., **Kern, J. L.**, and Millsap, R. E. (Submitted). A differential measurement and prediction framework for improving the accuracy and usefulness of differential prediction analysis.
- Kern, J. L.** and Köhn, H.-F. (Submitted). Fitting multi-source (three-way) proximity data by additive tree models.
- Kern, J. L.**, Choe, E. M., and Chang, H.-H. (Submitted). Using response times to improve estimation in CAT with a joint maximum a posteriori estimator.
- Curtiss, S. L., McBride, B. A., **Kern, J. L.**, Santos, R. M., Laxman, D. J., Jeans, L. M., Weglarz-Ward, J. (Submitted). The use of multiple correspondence analyses to better understand provider attitudes toward father involvement in early intervention.

Manuscripts in Preparation

- Kern, J. L.**, Zhang, S., Sun, T., Zhang, B., Amrhein, R., Deceanne, A., and Lee, A. An ideal-point multidimensional computerized adaptive test for the Big Five personality assessment.
- Zheng, C. and **Kern, J. L.** A factor mixture model approach to 3PL and 4PL models.
- Kern, J. L.** An R toolbox for a tour of Procrustes analysis procedures.

Conference Presentations

- Laxman, D. J., Santos, R. M., **Kern, J. L.**, McBride, B. A., Jeans, L. M., Curtiss, S. L., Weglarz-Ward, J. M., and Dyer, W. J. (2017, April). *Parental attitudes of immigrant mothers from the Philippines, Mexico, China, and India*. Paper to be presented at the biennial meeting of the Society for Research in Child Development, Austin, TX.
- Curtiss, S. L., McBride, B. A., Uchima, K., Laxman, D. J., Santos, R. M., Weglarz-Ward, J. M., and **Kern, J. L.** (2017, April). *Understanding provider perceptions: Father involvement in early intervention*. Paper to be presented at the biennial meeting of the Society for Research in Child Development, Austin, TX.
- Kern, J. L.**, Zhang, S., Sun, T., Zhang, B., Amrhein, R., Deceanne, A., and Lee, A. (2016, October). *Multidimensional Computerized Adaptive Test for the Big Five Personality Assessment*. Paper presented at the annual Ideas in Testing Research Seminar, Chicago, IL.
- Kern, J. L.**, Choe, E. M., and Chang, H.-H. (2016, April). *Exposure control for response time-informed item selection and estimation in CAT*. Paper presented at the annual meeting of the National Council on Measurement in Education, Washington, DC.
- McBride, B. A., **Kern, J. L.**, Curtiss, S. L., Santos, R. M., Laxman, D. J., Jeans, L. M., Weglarz-Ward, J. M., and Dyer, W. J. (2016, February). *The use of multiple correspondence analyses to better understand provider attitudes to father involvement in early intervention*. Paper presented at the Conference on Research Innovations in Early Intervention, San Diego, CA.
- Kern, J. L.** and Chang, H.-H. (2015, September). *Maximizing all the information: Using response times in CAT*. Paper presented at the annual meeting of the International Association of Computerized Adaptive Testing, Cambridge, England.
- Kern, J. L.** and Chang, H.-H. (2015, April). *An unfolding-type polychoric correlation*. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago, IL.
- Laxman, D. J., McBride, B. A., Dyer, J. D., Santos, R. M., Jeans, L. M., **Kern, J. L.**, Weglarz-Ward, J., and Curtiss, S. L. (2015, March). *Change in children's functional abilities across time and contributions of father involvement*. Paper presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.
- McBride, B. A., Curtiss, S. L., Santos, R. M., Laxman, D. J., Jeans, L. M., Weglarz-Ward, J., Dyer, W. J., and **Kern, J. L.** (2015, March). *Father involvement in early intervention: Identifying the barriers*. Paper presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.
- Kern, J. L.**, McBride, B. A., Laxman, D. J., and Dyer, W. J. (2014, July). *Multiple-group measurement invariance: Applying the invariance hierarchy to more than two groups*. Paper presented at the annual meeting of the Psychometric Society, Madison, WI.
- Kern, J. L.** (2014, April). *Using response times to improve estimation in CAT*. Paper presented at the annual meeting of the National Council on Measurement in Education, Philadelphia, PA.

- Choe, E. M., and **Kern, J. L.** (2014, April). *Controlling item exposure for response time-informed item selection in CAT*. Paper presented at the annual meeting of the American Educational Research Association, Philadelphia, PA.
- Laxman, D. J., McBride, B. A., Curtiss, S. L., Santos, R. M., Dyer, W. J., **Kern, J. L.**, and Jeans, L. M. (2014, February). *The determinants of men's parenting behaviors in families of children with disabilities*. Paper presented at the Conference on Research Innovations in Early Intervention, San Diego, CA.
- McBride, B. A., Laxman, D. J., Curtiss, S. L., Santos, R. M., Dyer, W. J., **Kern, J. L.**, and Jeans, L. M. (2014, February). *Identifying the training needs of early intervention personnel: Family focused programming includes fathers*. Paper presented at the Conference on Research Innovations in Early Intervention, San Diego, CA.
- McBride, B. A., Laxman, D. J., Dyer, W. J., **Kern, J. L.**, Santos, R. M., and Jeans, L. M. (2013, April). *Disability status vs. functional abilities in predicting child outcomes*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.
- Kern, J. L.**, McBride, B. A., Laxman, D. J., Dyer, W. J., Santos, R. M., Sugimura, N., and Jeans, L. M. (2013, April). *Testing measurement invariance of functional factors of father involvement in families of children with disabilities*. Paper presented at the biennial meeting of the Society for Research in Child Development, Seattle, WA.
- McBride, B. A., Laxman, D. J., Dyer, W. J., Santos, R. M., Jeans, L. M., **Kern, J. L.**, Sugimura, N., and Corr, C. (2013, April). *Father involvement and maternal depressive symptoms in families of children with disabilities*. Paper presented at the biennial meeting of the Society for Research in Child Development, Seattle, WA.
- Kern, J. L.**, and Hong, S. (2012, July). *Mapping of cognitive maps by bidimensional regression vs. bivariate polynomial regression*. Paper presented at the annual meeting of the Psychometric Society, Lincoln, NE.

Research Experience

Men's Parenting Behaviors in Families of Children with Disabilities: Findings from the ECLS-B Institute for Educational Sciences

Research Assistant, May 2012–Present

- PI: Dr. Brent A. McBride (Co-PIs: Drs. Rosa Milagros Santos and W. Justin Dyer)
- Responsible for data analysis, writing, and giving statistical advice.
- Worked on establishing measurement invariance for composite measures of father involvement across disability groups and across time using the large nationally representative dataset Early Childhood Longitudinal Study—Birth Cohort (ECLS-B).

Work on the HSK (Chinese Proficiency Test)

- Advisor: Dr. Hua-Hua Chang
- In this project, our lab has worked on improving the HSK. In particular, we proposed a method to construct parallel test forms for the HSK. As part of this, I proposed the use of a measure of parallelism of tests.
- We are also working to bring the test into an adaptive setting. For this part, I have helped with reviewing the literature on item pool development in computer adaptive testing, and proposed a simulation to determine the eventual design of the item pool. Additionally, I helped with the review of the literature to determine how to equate the linear paper-and-pencil version of the HSK with the eventual adaptive version of the HSK.

- We are also working on using cognitive diagnosis models to give a fine-grained approach to helping students taking the HSK learn how to improve themselves. For this part, I proposed an approach to identifying attributes, constructing a Q-matrix, and validating the Q-matrix.
- Responsible for writing, editing, and helping with analysis.

Technical Skills

Programming: R, C++, MATLAB

Statistical Packages: SPSS, SYSTAT, SAS, AMOS, MPlus

Specialized Software: WINSTEPS, BILOG-MG, MULTILOG

Other: L^AT_EX

Professional Experience

Norming of the ACT Engage-Teacher Edition American College Testing (ACT)

Research Intern, June 2013–August 2013

- Advisors: Drs. Alex Casillas and Rongchun Zhu
- Responsible for data analysis and cleaning.
- Worked on creating the statistical norm for grades 6–12 of the ACT Engage-Teacher Edition. This norm is used for making comparisons of students on the behavioral scales used by the ACT Engage-Teacher Edition.

Ad hoc reviewer

Applied Psychological Measurement

Educational Measurement: Issues and Practice

Journal of Early Intervention

Psychology of Violence

Professional Memberships

American Psychological Association, Division 5–Evaluation, Measurement, and Statistics, since 2011.

Psychometric Society, since 2012.

National Council of Measurement in Education, since 2012.

American Statistical Association, since 2013.

Society for American Baseball Research, since 2015.

Selected Coursework

Item response theory

Classical test theory

Computer adaptive testing

Covariance structure and factor models

N -way component analysis

Multidimensional scaling

Hierarchical linear modeling

Probability theory and statistics

Mathematical statistics I & II

Multivariate statistics

Multivariate data analysis

Survival analysis

Categorical data analysis

Numerical analysis

References

Hua-Hua Chang
Professor of Psychology and Educational Psychology
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Brent McBride
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brentmcb@illinois.edu

Lawrence Hubert
Professor Emeritus of Psychology
University of Illinois at Urbana-Champaign
(217) 333-6593
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Steven Culpepper
Associate Professor of Statistics
University of Illinois at Urbana-Champaign
(217) 333-2167
sculpepp@illinois.edu