Seang-Hwane (Sean) Joo

Associate Research Scientist
Division of Research and Development
Educational Testing Service
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EDUCATION

2012 – 2017	**Ph.D. Educational Measurement and Statistics** University of South Florida, Tampa, FL
2010 – 2012	**M.A. Mathematics** University of South Florida, Tampa, FL
2005 – 2010	**B.S. Mathematics** Pittsburg State University, Pittsburg, KS

RESEARCH INTERESTS

- Psychometrics
- Large-scale assessment
- Multilevel modeling
- Bayesian analysis
- Single-case experimental design
- Structural equation modeling
- Noncognitive assessment

PROFESSIONAL EXPERIENCE

2018 – Present	**Associate Research Scientist** Division of Research and Development Educational Testing Service, Princeton, NJ - Psychometric analysis and research for international large-scale assessments (PISA and PIAAC).
2017 – 2018	**Postdoctoral Research Fellow** Faculty of Psychology and Educational Sciences Katholieke Universiteit (KU) Leuven, Kortrijk, Belgium - Research title: *Multilevel statistical analysis of complex online learning data: Further development of explanatory item response theory.* - Supervisor: Wim Van den Noortgate

2017 – 2018	**Statistical Consultant**
	Drasgow Consulting Group
	- Evaluated personality assessment using multidimensional forced-choice.
	- Conducted simulation studies to evaluate forced-choice format scoring.

2015 – 2017	**Graduate Research Assistant**
	Department of Educational and Psychological Studies
	University of South Florida, Tampa, FL
	- Research Title: *Multilevel modeling of single-subject experimental data: Handling data and design complexities.*
	- Supervisor: John Ferron

2015	**Statistical Consultant**
	School Board of Polk County, Bartow, FL
	- Statistical analysis using multilevel models for the early warning system.

2014 – 2015	**Measurement Computer Lab Assistant**
	Department of Educational and Psychological Studies
	University of South Florida, Tampa, FL
	- Assisted graduate students with statistical analysis and software.
	- Statistical Software: SAS, R, SPSS, HLM, BILOG, and Mplus

TEACHING EXPERIENCE

2016 – 2017	**Graduate Teaching Assistant**
	Department of Educational and Psychological Studies
	University of South Florida, Tampa, FL
	- Co-instructing graduate-level statistics courses.
	- Courses: EDF 7408 Statistical Analysis for Educational Research II
	EDF 7484 Multivariate Statistics

2013 – 2014	**SMART Lab Instructor**
	Department of Mathematics and Statistics
	University of South Florida, Tampa, FL
	- Assisted undergraduate students with math and stat courses

2010 – 2014	**Graduate Teaching Assistant**
	Department of Mathematics and Statistics
	University of South Florida, Tampa, FL
	- Taught undergraduate-level mathematics and statistics courses
	- Courses: STA 2023 Introductory Statistics
	MGF 1106 Finite Mathematics
	MAC 1105 College Algebra
	MAC 2233 Business Calculus
	MAC 2241 Life Science Calculus

PUBLICATIONS

Journal Articles

Joo, S. H., Lee, P., & Stark, S. (in press). Adaptive testing with the GGUM-RANK multidimensional forced choice model: Comparison of pair, triplet, and tetrad scoring, *Behavior Research Methods.*

Nye, C., **Joo, S. H.,** Stark, S., & Zhang, B. (in press). Advancing and evaluating IRT model data fit indices in organizational research, *Organizational Research Methods.*

Shin, H. J., Lubaway, E., **Joo, S. H.,** Robin, F., Yamamoto, K. (in press). Comparability of response time scales in PISA, *Psychological Test and Assessment Modeling.*

Lee, P., **Joo, S. H.,** & Faffe, S. (2019). Investigating faking effects on the construct validity through the Monte Carlo simulation study, *Personality and Individual Differences, 150,* 109491.

Joo, S. H., & Kim, E. S., (2019). Impact of error structure misspecification when testing measurement invariance and latent-factor mean difference using MIMIC and multiple-group confirmatory factor analysis, *Behavior Research Methods, 51,* 2688-2699.

Joo, S. H., & Ferron, J. M. (2019). Application of the within- and between-series estimators to non-normal multiple-baseline data: Maximum likelihood and Bayesian approaches, *Multivariate Behavioral Research, 54,* 666-689.

Joo, S. H., Chun, S., Stark, S., & Chernyshenko, O. S. (2019). Item parameter estimation with the general hyperbolic cosine ideal point IRT model, *Applied Psychological Measurement, 43,* 18-33.

Joo, S. H., Ferron, J. M., Moeyaert, M., Beretvas, S. N., & Van den Noortgate, W. (2019). Approaches for specifying the level-1 error structure when synthesizing single-subject data, *Journal of Experimental Education, 87,* 55-74.

Lee, P., **Joo, S. H.,** Stark, S., & Chernyshenko, O. S. (2019). GGUM-RANK statement and person parameter estimation with multidimensional forced choice triplets, *Applied Psychological Measurement, 43,* 226-420.

Lee, P., **Joo, S. H.,** & Lee, S. (2019). Examining stability of personality profile solutions between Likert-type and multidimensional forced choice measure, *Personality and Individual Differences, 142,* 13-20.

Park, J. Y., **Joo, S. H.,** Cornillie, F., Van der Maas, H. L. J., & Van den Noortgate, W. (2019). An explanatory IRT method for alleviating the cold-start problem in the adaptive learning environment, *Behavior Research Methods, 51,* 895-909.

Pliakos, K., **Joo, S. H.**, Park, J. Y., Cornillie, F., Vens, C., & Van den Noortgate, W. (2019). Integrating machine learning into item response theory for addressing the cold start problem in adaptive learning systems, *Computers & Education, 137,* 91-103.

Joo, S. H., Lee, P., & Stark, S. (2018). Development of information functions and indices for the GGUM-RANK multidimensional forced choice IRT model, *Journal of Educational Measurement, 55,* 357-372.

Joo, S. H., Ferron, J. M., Beretvas, S. N., Moeyaert, M., & Van den Noortgate, W. (2018). The impact of response-guided baseline phase extensions on treatment effect estimates, *Research in Developmental Disabilities, 79,* 77-87.

Ferron, J. M., **Joo, S. H.,** & Levin, J. R. (2017). A Monte Carlo evaluation of masked visual analysis in response-guided versus fixed-criteria multiple-baseline designs, *Journal of Applied Behavior Analysis, 50*, 701-716.

Joo, S. H., Lee, P., & Stark, S. (2017). Evaluating anchor-item designs for concurrent calibration with the GGUM, *Applied Psychological Measurement, 41*, 83-96.

Lee, P., **Joo, S. H.**, & Stark, S. (2017). Linking methods for the Zinnes-Griggs pairwise preference IRT model, *Applied Psychological Measurement, 41*, 130-144.

Kim, E. S., **Joo, S. H.**, Lee, P., Wang, Y., & Stark, S. (2016). Measurement invariance testing across between-level latent classes using multilevel factor mixture modeling, *Structural Equation Modeling, 23*, 870-887.

Wang, W., Lee, P., **Joo, S. H.**, Stark, S. & Louden, R. (2016). MCMC Z-G: An IRT computer program for force-choice noncognitive measurement, *Applied Psychological Measurement, 40*, 551-553.

Book Chapter

Ferron, J. M., & **Joo, S. H.** (2018). Binomial Test. In B. B. Frey (Ed.) *The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation*. (pp. 202-205). Thousand Oaks, CA: Sage Publications, Inc.

Conference Presentations and Proceedings

Joo, S. H., Khorramdel, L., Yamamoto, K., Shin, H. J., & Robin, F. (2020). *Evaluating item fit statistic threshold for cross-country comparability analysis in PISA.* Accepted paper presentation for the National Council on Measurement in Education, San Francisco, CA.

Ali, U. S., **Joo, S. H.**, & Robin, F. (2020). *Impact of item misfit on group score reporting in large-scale assessments.* Accepted poster presentation for the National Council on Measurement in Education, San Francisco, CA.

Pliakos, K., **Joo, S. H.,** Park, J. Y., Cornillie, F., Vens, C., Van den Noortgate, W. (2020). *Comparing item response prediction based on machine learning and explanatory item response theory.* Accepted poster presentation for the National Council on Measurement in Education, San Francisco, CA.

Kerzabi, E., Shin, H. J., **Joo, S. H.**, Robin, F., & Yamamoto, K. (2020). *Comparability and dimensionality of response time in PISA*. Accepted paper presentation for the National Council on Measurement in Education, San Francisco, CA.

Chen, L., Oh, H. J., Guo, H., & **Joo, S. H.** (2020). *Evaluating test form equivalence of translated tests across language groups.* Accepted paper presentation for the National Council on Measurement in Education, San Francisco, CA.

Joo, S. H., Lee, P., & Stark, S. (2019). *Evaluating Bayesian DIF detection methods using an ideal point IRT model.* Paper presentation for the National Council on Measurement in Education annual meeting, Toronto, Canada.

Wang, Y., **Joo, S. H.**, Chun, S., Almari, A., Lee, P., Kim, E. S., & Stark, S. (2019). *Evaluating latent class models when ignoring and accounting for clustering.* Paper presentation for the American Educational Research Association annual meeting, Toronto, Canada.

Lee, P., **Joo, S. H.,** Stark, S, & Lee, S. (2019). *Examining the effectiveness of MFC personality assessments from diverse perspectives.* Symposium for the Society of Industrial Organizational Psychology annual meeting, Washington, DC.

Stark, S., Lee, P., & **Joo, S. H.** (2018). *Improving resistance to response biases in personality measurement: Advances in forced-choice modeling.* Paper presentation at the International Test Commission annual meeting, Montreal, Canada.

Lee, P., **Joo, S. H.**, & Stark, S. (2018). *Testing DIF for MFC measures using Thurstonian item response theory.* Paper presentation for the Society of Industrial Organizational Psychology annual meeting, Chicago, IL.

Joo, S. H., Lee, P., & Stark, S. (2017). *Information functions for the GGUM-RANK multidimensional- forced-choice model*, Paper presentation at the International Meeting of the Psychometric Society, Zurich, Switzerland.

Lee, P., **Joo, S. H.**, & Stark, S. (2017). *Investigating free-baseline DIF detection method for the Thurstonian IRT model*, Poster presentation at the International Meeting of the Psychometric Society, Zurich, Switzerland.

Stark, S., **Joo, S. H.**, Lee, P., & Chernyshenko, O.S. (2017). *Forced choice modeling: Advances and implications for military personnel testing*. Paper presentation at the International Military Testing Association meeting, Bern, Switzerland.

Lee, P., **Joo, S. H.**, Stark, S., & Chernyshenko, O.S. (2017). *Validity evidence for multidimensional forced choice measures across different scoring approaches.* Paper presentation at the European Conference on Psychological Assessment, Lisbon, Portugal.

Hicks, T., Kim, E. S., **Joo, S. H.**, Choi, H., Ferron, J., & Kromrey, J (2017). *Design-comparable effect sizes for single-case research: A Bayesian approach,* Paper presentation at the Modern Modeling Method annual meeting, Storrs, CT.

Joo, S. H., Wang, Y., & Ferron, J. M. (2017). *Bias and precision of within- and between-series effect estimates in the meta-analysis of multiple baseline studies*, Poster presentation at the American Educational Research Association annual meeting, San Antonio, TX.

Ferron, J. M. & **Joo, S. H.** (2017). *Waiting for baselines to stabilize: Consequences of response-guided experimentation on meta-analyses of single-case studies*, Poster presentation at the American Educational Research Association annual meeting, San Antonio, TX.

Marn, T., Mahoney, E., & **Joo, S. H.** (2017). *Comparing black, white, and biracial students' math achievement using propensity score matching: Data from HSLS.* Roundtable presentation at the American Educational Research Association annual meeting, San Antonio, TX.

Nye, C., **Joo, S. H.,** & Stark, S. (2017). *Advancing and evaluating IRT model data fit indices*, Symposium presentation at the Society of Industrial and Organizational Psychology annual meeting, Orlando, FL.

Stark, S., **Joo, S. H.,** & Lee, P. (2017). *Information functions for the GGUM-RANK multidimensional-forced-choice model: Comparison of pair, triplet, and tetrad measures*, Symposium presentation at the Society of Industrial and Organizational Psychology annual meeting, Orlando, FL.

Joo, S. H., Wang, Y., & Ferron, J. M. (2016). *Comparison of within- and between-series meta-analysis for multiple baseline studies*, Paper presentation at the Florida Educational Research Association annual meeting, Lakeland, FL.

Joo, S. H., Wang, Y., Montgomery, J., de Gil. P. R., Kim, E. S., Kromrey, J. (2016). *Evaluating multiple imputation techniques for treating missing data in propensity score analysis*, Paper presentation at the Modern Modeling Method annual meeting, Storrs, CT.

Joo, S. H., Lee, P & Stark, S. (2016). *Information functions of multidimensional forced-choice IRT models,* Paper presentation at the National Council on Measurement in Education annual meeting, Washington, DC.

Joo, S. H., & Ferron, J. M. (2016). *Synthesizing single-case data with multilevel models: How best to handle complex level-1 error structures,* Poster presentation at the American Educational Research Association annual meeting, Washington, DC.

de Gil, P. R., **Joo, S. H.**, Wang, Y., Kromrey, J., Kim, E. S., Montgomery (2016). *An empirical comparison of multiple imputation approaches for treating missing data in observational studies*, Poster presentation at the American Educational Research Association annual meeting, Washington, DC.

Nguyen, D., de Gil, P. R., Kellermann, A., Wang, Y., Montgomery, J., **Joo, S. H.**, & Kromrey, J (2016). Do SAS® high-performance statistical procedures really perform "Highly"? A comparison of HP and legacy procedures, *Proceedings of the SAS Global Forum, Las Vegas, NE*.

Joo, S. H., & Ferron, J. M. (2015). *A simulation study of masked visual analysis of single case data,* Paper presentation at the Florida Educational Research Association annual meeting, Orlando/Altamonte Spring, FL.

Joo, S. H., Lee, P., Stark, S. & Seybert, J. (2015). *Evaluating anchor-item designs for concurrent calibration with the GGUM,* Paper presentation at the National Council on Measurement in Education annual meeting, Chicago, IL.

Lee, P., **Joo, S. H.,** Stark, S. & Seybert, J. (2015). *Linking methods for the Zinnes-Griggs pairwise preference IRT model,* Paper presentation at the National Council on Measurement in Education annual meeting, Chicago, IL.

Montgomery, J., **Joo, S. H.**, Kellerman, A., Kromrey, J., Nguyen, D., Pham, T., de Gil, P. R., & Wang, Y. (2015). High-performance procedures in SAS 9.4: Comparing performance of HP and legacy procedures, *Proceedings of the Southeast SAS User Group, Savanna, SC*.

Wang, Y., **Joo, S. H.**, de Gil, P. R., Kromrey, J., Lanehart, R., Kim, E. S., Montgomery, J., Lee, R., Cao, C., & Ashford, S. (2015). An empirical comparison of multiple imputation approaches for treating missing data in observational studies, *Proceedings of the Southeast SAS User Group, Savanna, SC*.

Kim, E. S., Kromrey, J., **Joo, S. H.,** Wang, Y., Montgomery, J., Lee, R., de Gil, P. R., Ashford, S., Lanehart, R. & Cao, C. (2015). Propensity score analysis with missing data: the comparison of multiple imputation approaches, *Proceedings of the Joint Statistical Meetings, Seattle, WA*.

Joo, S. H. & Jayawardhana, A. (2010). *William Gossett and the student's t-distribution*, Individual presentation at the Kappa Mu Epsilon mathematical honor society regional chapter meeting, Warrensburg, MO.

Workshops and Invited Talks

Joo, S. H. (2020). *Advancing multidimensional forced choice measurement: Improving the efficiency and accuracy of noncognitive test scores*, Invited presentation at the Department of Educational Psychology, University of Kansas, Lawrence, KS.

Joo, S. H. (2018). *Parameter estimation and information function for the general hyperbolic cosine ideal point IRT model*, Invited presentation at the Division of Research and Development, Educational Testing Service, Princeton, NJ.

Joo, S. H. (2018). *Robustness of the within- and between-series estimators to non-normal multiple-baseline studies: A Monte Carlo study*, Invited presentation at the Methodology of Educational Sciences Research Group (CMPO), KU Leuven, Belgium.

Joo, S. H. (2017). *The overview of single-case research design studies and statistical analysis methods*, Invited presentation at the Department of Psychology, Florida International University, Miami, FL.

Thompson, C., Ferron, J. M., & **Joo, S. H.** (2016). *Meta-analysis of group and single-case studies*, Workshop presentation at the Florida Educational Research Association annual meeting, Lakeland, FL.

RESEARCH GRANT

2019 – 2020   Measurement Frontiers Research Funding
                   Division of Research and Development
                   Educational Testing Service
                   Research Title: *Psychometric Advances in Large-scale Assessments*

PROFESSIONAL SERVICES

Journal Reviewer: *Applied Psychological Measurement*
                    Assessment
                    Behavior Research Methods
                    Journal of Educational Measurement
                    Journal of Psychoeducational Assessment
                    Statistical Analysis and Data Mining

TECHNICAL SKILLS

Statistical Packages: R, SAS, Mplus, SPSS, HLM, Minitab
Programming: Ox, C++, Matlab, Maple

ACADEMIC HONORS/AWARDS

2019   SPOT Award
                   Division of Research and Development
                   Educational Testing Service

2016 – 2017	Student Government Scholarship
	Office of Graduate Studies
	University of South Florida

2010	Tharp Scholarship
	Department of Mathematics and Statistics
	University of South Florida

2008 – 2009	International Advocate Scholarship
	International Student Association
	Pittsburg State University

2008 – 2009	Department Scholarship
	Department of Mathematics
	Pittsburg State University

PROFESSIONAL ORGANIZATIONS

American Educational Research Association (AERA)
National Council on Measurement in Education (NCME)
Florida Educational Research Association (FERA)
International Meeting of Psychometric Society (IMPS)
Society of Industrial and Organizational Psychology (SIOP)