Ke-Hai Yuan

Curriculum Vitae

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Education

1992-1995	Ph.D. in Mathematics with Concentration in Statistics, UCLA
1985-1988	M.S. in Applied Mathematics with Concentration in Statistics Beijing Institute of Technology
1981-1985	B.S. in Applied Mathematics, Beijing Institute of Technology

Positions

2008-	Professor, Department of Psychology University of Notre Dame
2018-2023	Visiting Professor, Department of Statistics Nanjing University of Posts and Telecommunications
2016-2023	Visiting Chair Professor, School of Statistics Renmin University of China
2016(09-10)	Visiting Professor, Graduate School of Engineering Science Osaka University
2014(01-04)	Visiting Professor, Department of Psychology The Chinese University of Hong Kong
2005-2008	O'Neill III Associate Professor, Department of Psychology University of Notre Dame
2001-2005	Associate Professor, Department of Psychology & Lab for Social Research University of Notre Dame
1998-2001	Assistant Professor, Department of Psychology University of North Texas
1995-1998	Statistician, Department of Psychology, UCLA
1992-1995	Graduate Student Researcher, Department of Psychology, UCLA
1988-1992	Assistant Professor, Department of Applied Mathematics Beijing Institute of Technology

Professional services

- Associate Editor, Psychometrika (2023-).
- Associate Editor, Journal of Behavioral Data Science (2021-).
- Member of Editorial Board, Educational and Psychological Measurement (2000-).
- Member of Editorial Board, Structural Equation Modeling (2006-).
- Consulting Editor, Multivariate Behavioral Research (2006-).
- Member of Editorial Board, Journal of Educational and Behavioral Statistics (2011-).
- Member of Editorial Board, JSM Mathematics and Statistics (2014-).

- Member of Advisory Board, Behaviormetrika (2016-).
- Consulting Editor, Psychological Methods (2016-).
- Member of Editorial Board, Psicologia: Reflexão e Crítica (2018-).
- Guest Editor, Sage Open (2017-2018).
- Associate Editor, Journal of Multivariate Analysis (2008-2016).
- Associate Editor, Psychological Methods (2013-2015).
- Member of Editorial Board, Sociological Methodology (2007-2009).
- Member of Editorial Board, Educational Researcher (2013-2019).
- Reviewed grant proposals for NSF, Institute of Education Sciences, Spencer Foundation, Research Council of Canada, The Research Grant Council of Hong Kong, books for Lawrence Erlbaum Associates, Taylor and Francis Group, Guilford Press, and manuscripts for over twenty journals.

Professional Honors

- The James McKeen Cattell Sabbatical Award (2005).
- The Raymond B. Cattell Award for Early-Career Outstanding Multivariate Research (2002) from the Society of Multivariate Experimental Psychology.
- Elected member of the Society of Multivariate Experimental Psychology (2002-).

Grants and Sponsored Programs

- Co-PI, Institute of Education Sciences (Zhiyong Johnny Zhang, PI): Methods and software for handling network data and text data in structural equation modeling ($861,354), 2021–2024.
- PI, National Science Foundation: Structural equation modeling with small N and large p ($349,998), 2015–2018.
- Co-PI, Organization for Autism Research (Juhi Kaboski, PI): Comorbidities in ASD: Developmental trajectories and predictors of adult outcomes. ($30,000), 2016.
- Co-PI, Institute of Education Sciences (Zhiyong Johnny Zhang, PI): A general framework for statistical power analysis with non-normal and missing data through Monte Carlo simulation ($573,097), 2014–2017.
- Co-PI, CTB/McGraw-Hill (Ying Cheng, PI): A closer look at response time in adaptive testing ($43,037), 2014.
- Co-PI, CTB/McGraw-Hill (Ying Cheng, PI): Careless response in testing: Detection of such responses, and analysis of their propagating impact on item calibration, ability estimation, and examinee classification ($85,059), 2013.
- Co-PI, CTB/McGraw-Hill (Ying Cheng, PI): Standard error estimation in IRT: Formula, bootstrap or MCMC? ($83,370), 2011.
- Co-PI, CTB/McGraw-Hill (Ying Cheng PI): Correction of calibration error in computerized adaptive testing ($80,000), 2010.

- The James McKeen Cattell Sabbatical Award ($32,000), 2016.
- PI, National Science Foundation: Development of statistical modeling methods for analysis of social and behavioral science data with non-ignorable nonresponses ($168,459), 2004-2007.
- Co-PI, National Institute of Health (Michael J. Wenger, PI) Neuroscience, models, and methods in cognitive aging ($15,000), 2003-2004.
- Co-PI, National Institute of Health (Steven M. Boker, PI): Dynatical systems data analysis ($18,650), 2002-2003.

Topics worked on

Mean comparison; regression; factor analysis; structural equation modeling; multilevel modeling; growth curve model; mixture model; item response model; measurement invariance; mediation and moderation analysis; post-hoc power; meta analysis/combining mean differences; asymptotics; statistical computation; estimating equations; bootstrap and cross-validation; nonnormal distribution; robust methods; missing data; big data (data with many variables but limited sample size); equivalence testing; partial least squares; and software development.

Courses Taught

Experimental psychology I: Statistics; Psychometric theory; Multivariate statistics; Factor analysis; Structural equation modeling; Advanced structural equation modeling; Multilevel modeling; Computational statistics; Statistical methods; Exploratory data analysis; Missing data analysis; Linear model.

Doctoral dissertations directed

- Brenna Gomer, University of Notre Dame (2021): *Quantifying the impact of missing-data mechanism uncertainty: a tailored sensitivity analysis approach for the behavioral sciences.*
- Agung Santoso, University of Notre Dame (2018): *Equivalence testing for anchor selection in differential item functioning (DIF) detection.*
- Ge (Gabriella) Jiang, University of Notre Dame (2018): *Ridge methods for confirmatory factor analysis of ordinal variables.*
- Miao (Michelle) Yang, University of Notre Dame (2018): *Optimizing ridge generalized least squares for structural equation modeling.*
- Meghan Cain, University of Notre Dame (2017, co-directed with Zhiyong Zhang): *Fit for a Bayesian: An Evaluation of PPP and DIC.*
- Laura Lu, University of Notre Dame (2011, codirected with Zhiyong Zhang): *Bayesian inference of robust growth mixture models with non-ignorable missing data.*
- Wei Zhang, University of Notre Dame (2010): *Estimating latent variable interactions with missing data.*

- Xiaoling Zhong, University of Notre Dame (2010): *Model selection, evaluation and tests of invariance in finite factor mixture modeling using a two stage approach.*
- Summer Zu, University of Notre Dame (2009): *Robust procedures for mediation analysis.*
- Ken Kelley, University of Notre Dame (2005, codirected with Scott Maxwell): *Estimating nonlinear change models in heterogeneous populations when class membership is unknown: Defining and developing the latent classification differential change model.*
- Richard Herrington, University of North Texas (2001): *Simulating statistical power curves with the bootstrap and robust estimation.*

Teaching 2023

- Spring+Fall: Academic leave
- Spring+Fall: Coordinated statistical consulting
- Dissertation direction: Meng (Chris) Qiu
- First year project direction: Reyhaneh Sadat Razavi
- Dissertation committee: Meng (Chris) Qiu, Dayoung Lee
- Quantitative graduate student examination committee

Grant activities 2021-2023

- Co-PI, Institute of Education Sciences (Zhiyong Johnny Zhang, PI): Methods and software for handling network data and text data in structural equation modeling ($861,354.00, founded), 2021–2024.
- Co-PI, Institute of Education Sciences (Zhiyong Johnny Zhang, PI): Bayesian multilevel modeling for single case designs in handling categorical data, missing data, and nonnormal data ($313,538.00, pending), 08/01/2024-07/31/2027.
- Co-PI, Institute of Education Sciences (Zhiyong Johnny Zhang, PI): A comprehensive toolkit for effect size calculation with confidence intervals ($349,798.00, to submit), 08/01/2024-7/31/2026.
- Co-PI, National Science Foundation (Zhiyong Johnny Zhang, PI): Longitudinal mediation models with social networks ($402,128.00, not founded), 8/01/2021 - 7/31/2024.
- Co-PI, Institute of Education Sciences (Zhiyong Johnny Zhang, PI): A comprehensive toolkit for effect size calculation with confidence intervals ($349,706.00, not founded), 07/01/2022-6/30/2024. Institute for Education Sciences (Not founded).
- PI, National Science Foundation:. Advancing the methods of path analysis with weighted composites in social and behavioral sciences ($569,823.00, not founded), 07/01/2022-6/30/2025.

Professional service 2023

- Serving two journals as Associate Editors (Psychometrika, Journal of Behavioral Data Science)

- On the Editorial Board of 8 additional journals (see pages 1–2 of the CV)
- Co-organized the 2023 Annual Meeting of the International Society for Data Science and Analytics
- Wrote letters for Graduate Students and ND Alumni (Meng Qiu, Dayoung Lee, Brenna Gomer, Qian Zhang)
- Reviewed grant proposal for National Science Foundation(1), Hong Kong Research Grants Council(1)
- Served as external dissertation committee members on three PhD students at Beijing Normal University

Note: *superscripts s=graduate students (current or alumni) of Notre Dame, p=postdoc fellow (current or alumni) of Notre Dame, v=visiting scholar to Notre Dame, c=corresponding author.*

H-index on google scholar 55, I10-index 134, Citations 13165

Papers submitted/under-review

Ghasemy, M., & Yuan, K.-H. (2023). PLSe2 estimation of the models with independent and dependent observed variables: A Monte Carlo simulation study under conditions of normality and non-normality. *Statistical Methods & Applications*.

Hayashi, K, Yuan, K.-H., & Bentler, P. M. (2023). On the relationship between factor loadings and component loadings when latent traits and specificities are treated as latent factors. *Fudan Journal of the Humanities and Social Sciences*.

Qiu[s], M., Li[s], X., & Yuan, K.-H. (2023). What can bootstrap do in latent class analysis? A whole-process bootstrap framework. *Organizational Research Methods*.

Wang, S., Marcoulides, K., Tang, J., & Yuan[c], K.-H. (2023). A comparison of minimal-effect testing, equivalence testing, and the conventional null hypothesis testing for the analysis of bi-factor models. *Structural Equation Modeling*.

Yuan, K.-H., & Zhang, Z. (2023). Modeling data with measurement errors but without predefined metrics: Fact versus Fallacy. *Psychological Methods*.

Yuan, K.-H., Zhang, Z., & Wang, L. (2023). Signal-to-noise ratio in estimating and testing the mediation effect: Structural equation modeling vs path analysis with weighted composites. *Psychometrika*.

Papers in-press/online

Ghasemy, M., & Yuan, K.-H. (in press). Lecturers' turnover intention and intention to remain with the organization: A dynamic cross-lagged panel model estimation using the PLSe2 method. *Journal of Applied Research in Higher Education* doi: 10.1108/JARHE-06-2023-0234

Han, Y., Yuan, K.-H., & Liu[v], H. (in press). Two-step differential item functioning detection procedures without a priori information. Chinese *Journal of Psychological Science*.

Liu[v], H., Yuan[c], K.-H., & Li, H. (in press). A systematic framework for defining R-squared measures in mediation analysis. *Psychological Methods*. doi: 10.1037/met0000571

Marcoulides, K., & Yuan, K.-H. (in press). Testing structural equation model fit in psychological studies: A replication study using equivalence testing. *Quality & Quantity*. doi: 10.1007/s11135-023-01796-4

Meng[s], Q., & Yuan, K.-H. (in press). Label switching in latent class models: Accuracy of classification, parameter estimates and confidence intervals. *Structural Equation Modeling*. doi: 10.1080/10705511.2023.2213842

Publications

Deng[v], L., & Yuan[c], K.-H. (2023). Which method is more powerful in testing the relationship of theoretical constructs? A meta comparison of structural equation modeling and path analysis with weighted-composites. *Behavior Research Methods, 55*, 1460–1479. doi: 10.3758/s13428-022-01838-z

Gomer[s], B, & Yuan[c], K.-H. (2023). Missing data analysis. In D. McCaffrey & A. Rupp (Eds.), *International encyclopedia of education* (4th ed.) (pp. 805–818). Oxford, UK: Elsevier. ISBN: 978-0-12-818629-9

Gomer[s], B, & Yuan, K.-H. (2023). A realistic evaluation of methods for handling missing data when there is a mixture of MCAR, MAR, and MNAR mechanisms in the same dataset. *Multivariate Behavioral Research, 58*(5), 988–1013. doi: 10.1080/00273171.2022.2158776.

Mai[p], Y., Xu[s], Z., Zhang, Z., & Yuan, K.-H. (2023). An open source WYSIWYG web application for drawing path diagrams of structural equation models. *Structural Equation Modeling 30*(2), 328–335. doi:10.1080/10705511.2022.2101460

Marcoulides, K., Yuan, K.-H., & Deng[v], L. (2023). Structural equation modeling with small samples and many variables. In R.H. Hoyle (Ed.), *Handbook of structural equation modeling* (2nd ed.) (pp. 525–542). New York: Guilford Press. ISBN: 9781462544646

Yuan, K.-H. (2023). Comments on the article "Marketing or methodology? Exposing the fallacies of PLS with simple demonstrations" and PLS-SEM in general. *European Journal of Marketing, 57*, 1618–1625. doi: 10.1108/EJM-07-2021-0472

Yuan, K.-H., & Deng[v], L. (2023). A reply to "Structural parameters under partial least squares and covariance-based structural equation modeling: A comment on Yuan and Deng (2021)" by Schuberth, Rosseel, Rönkkö, Trichera, Kline, and Henseler (2023). *Structural Equation Modeling, 30*(3), 346–348. doi: 10.1080/10705511.2022.2134141

Yuan, K.-H., & Fang[v], Y. (2023). Which method delivers greater signal-to-noise ratio: Structural equation modeling or regression analysis with weighted composites? *British Journal of Mathematical and Statistical Psychology, 76*, 646–678. doi: 10.1111/bmsp.12293

Yuan, K.-H., & Fang[v], Y. (2023). Replies to comments on "Which method delivers greater signal-to-noise ratio: Structural equation modelling or regression analysis with weighted composites?" by Yuan and Fang (2023). *British Journal of Mathematical and Statistical*

Psychology, 76, 695–704. doi: 10.1111/bmsp.12323

Yuan, K.-H., Wen, Y., & Tang, J. (2023). Sensitivity analysis of the weights of the composites under partial least-squares approach to structural equation modeling. *Structural Equation Modeling, 30*(1), 53–69. doi: 10.1080/10705511.2022.2106487

Yuan, K-H., & Zhang, Z. (2023). Statistical and psychometric properties of three weighting schemes of the PLS-SEM methodology. In H. Latan, J.F. Hair, & R. Noonan (Eds.), *Partial least squares path modeling: Basic concepts, methodological issues, and applications* (pp. 81–112). doi: 10.1007/978-3-031-37772-3_4. Cham, Switzerland: Springer.

Liu[v], H., Yuan[c], K.-H., & Wen[v], Z. (2022). Two-level moderated mediation models with single level data and new measures of effect sizes. *Behavior Research Methods, 54*(2), 574–596. doi: 10.3758/s13428-021-01578-6

Yuan, K.-H., Gomer[s], B., & Marcoulides, K. (2022). Smoothed quantiles for χ^2 type test statistics with applications. *Multivariate Behavioral Research, 57*(2-3), 223–242. doi: 10.1080/00273171.2020.1858018

Gomer[s], B., & Yuan, K.-H. (2021). Subtypes of the missing not at random missing data mechanism. *Psychological Methods, 26*(5), 559–598. doi: 10.1037/met0000377

Hayashi, K., Yuan, K.-H., & Sato, R. (2021). On the coefficient alpha in high-dimensions. In M. Wiberg, D. Molenaar, J. González, U. Böckenholt, J.-S. Kim (Eds.), *Quantitative psychology: The 85th Annual Meeting of the Psychometric Society* (pp. 127–139). New York: Springer. doi: 10.1007/978-3-030-74772-5_12

Liu[v], H., & Yuan[c], K.-H. (2021). New measures of effect size in moderation analysis. *Psychological Methods, 26*(6), 680–700. doi:10.1037/met0000371

Liu[v], H., Yuan, K.-H., & Gan, K. (2021). Two-level mediated moderation models with single level data and new measures of effect sizes. *Acta Psychologica Sinica, 53*(3), 322–336. doi: 10.3724/SP.J.1041.2021.00322

Yuan, K.-H., & Deng[v], L. (2021). Equivalence of partial-least-squares SEM and the methods of factor-score regression. *Structural Equation Modeling, 28*(4), 557–571. doi: 10.1080/10705511.2021.1894940

Yuan, K.-H., & Gomer[s], B. (2021). An overview of applied robust methods. *British Journal of Mathematical and Statistical Psychology, 74*(S1), 199–246. doi: 10.1111/bmsp.12230

Yuan, K.-H., & Liu[v], F. (2021). Which method is more reliable in performing model modification: Lasso regularization or Lagrange multiplier test? *Structural Equation Modeling, 28*(1), 69–81. doi: 10.1080/10705511.2020.1768858

Yuan, K.-H., Liu[v], H., & Han, Y. (2021). Differential item functioning analysis without *a priori* information on anchor items: QQ plots and graphical test. *Psychometrika, 86*(2), 345–377. doi: 10.1007/s11336-021-09746-5

Fang, J., Wang, X., Yuan, K.-H., & Wen, Z. (2020). Childhood psychological maltreatment and moral disengagement: A moderated mediation model of callous-unemotional traits and empathy. *Personality and Individual Differences, 157*, 109814. doi: 10.1016/j.paid.2020.109814

Fang, J., Wang, X., Yuan, K.-H., Wen, Z., Yu, X., & Zhang, G. (2020). Callous-unemotional traits and cyberbullying perpetration: The mediating role of moral disengagement and the moderating role of empathy. *Personality and Individual Differences, 157*, 109829. doi: 10.1016/j.paid.2020.109829

Hayashi, K., & Yuan, K.-H. (2020). On the relationship between factor analysis and principal component analysis in high-dimensions. In Z. Zhang et al. (Eds.), *New developments in data science and data analytics* (pp. 133–146). Granger, IN: ISDSA Press.

Hayashi, K., Yuan, K.-H., & Jiang, G. (2020). On the precision matrix in semi-high dimensional settings. In M. Wiberg, S. Culpepper, R. Janssen, J. González, & D. Molenaar (Eds.), *Quantitative psychology: The 84th Annual Meeting of the Psychometric Society* (pp. 185–200). New York: Springer. doi:10.1007/978-3-030-43469-4_15

Li, B., Peng, L., Hayashi, K., & Yuan, K.-H. (2020). More accurate estimators of multiple correlation coefficient. In Z. Zhang et al. (Eds.), *New developments in data science and data analytics* (pp. 161–180). Granger, IN: ISDSA Press.

Li, Y., Wen, Z., Hau, K.-T., Yuan, K.-H., & Peng, Y. (2020). Effects of cross-loadings on determining the number of factors to retain. *Structural Equation Modeling, 27*(6), 841–863. doi: 10.1080/10705511.2020.1745075

Liu, H., Yuan, K.-H., & Liu, F. (2020). A two-level moderated latent variable model with single level data. *Multivariate Behavioral Research, 55*(6), 873–893. doi: 10.1080/00273171.2019.1689350

Marcoulides, K., & Yuan, K.-H. (2020). Using equivalence testing to evaluate goodness of fit in multilevel structural equation models. *International Journal of Research & Method in Education, 43*(4), 431–443. doi: 10.1080/1743727X.2020.1795113

Yuan, K.-H., Wen, Y., & Tang, J. (2020). Regression analysis with latent variables by partial least squares and four other composite scores: Consistency, bias and correction. *Structural Equation Modeling, 27*(3), 333–350. doi: 10.1080/10705511.2019.1647107

Zhang, Z., Yuan, K.-H., Wen, Y., & Tang, J. (2020 ed.). *New developments in data science and data analytics*. Granger, IN: ISDSA Press.

Gomer, B., Jiang, G., & Yuan, K.-H. (2019). New effect size measures for structural equation modeling. *Structural Equation Modeling, 26*(3), 371–389. doi: 10.1080/10705511.2018.1545231

Hayashi, K., Yuan, K.-H., & Jiang, G. (2019). On extended Guttman condition in high dimensional factor analysis. In M. Wiberg, S. Culpepper, R. Janssen, J. González, & D. Molenaar (Eds.), *Quantitative psychology: The 83rd Annual Meeting of the Psychometric Society* (pp. 221–228). New York: Springer.

Tian, Y., & Yuan, K.-H. (2019). Mean and variance corrected test statistics for structural equation modeling with many variables. *Structural Equation Modeling, 26*(6), 827–846. doi: 10.1080/10705511.2019.1598865

Yang, M., & Yuan, K.-H. (2019). Optimizing ridge generalized least squares for structural equation modeling. *Structural Equation Modeling, 26*(1), 24–38. doi:

10.1080/10705511.2018.1479853

Yuan, K.-H., Fan, C., & Zhao, Y. (2019). What causes the mean bias of the likelihood ratio statistic with many variables? *Multivariate Behavioral Research, 54*(6), 840–855. doi: 10.1080/00273171.2019.1596060

Yuan, K.-H., Zhang Z., & Deng, L. (2019). Fit indices for mean structures with growth curve models. *Psychological Methods, 24*(1), 36–53. doi: 10.1037/met0000186

Zhang, Q., Yuan, K.-H., & Wang, L. (2019). Asymptotic bias of normal-distribution-based maximum likelihood estimates of moderation effects with missing at random data. *British Journal of Mathematical and Statistical Psychology, 72*, 334–354. doi: 10.1111/bmsp.12151

Hayashi, K., Yuan, K.-H., & Liang, L. (2018). On the bias in eigenvalues of sample covariance matrix. In M. Wiberg, S. Culpepper, R. Janssen, J. González, & D. Molenaar (Eds.), *Quantitative psychology: The 82nd Annual Meeting of the Psychometric Society* (pp. 221–233). Switzerland: Springer.

Yang, M., Jiang, G., & Yuan, K.-H. (2018). The performance of ten modified rescaled statistics as the number of variables increases. *Structural Equation Modeling, 25*(3), 414–438. doi: 10.1080/10705511.2017.1389612

Yuan, K.-H., Jamshidian, M., & Kano, Y. (2018). Missing data mechanisms and homogeneity of means and variances-covariances. *Psychometrika, 83*(2), 425–442. doi: 10.1007/s11336-018-9609-x

Yuan, K.-H., & Kano, Y. (2018). Meta analytical SEM: Equivalence between maximum likelihood and generalized least squares. *Journal of Educational and Behavioral Statistics, 43*(6), 693–720. doi: 10.3102/1076998618787799

Yuan, K.-H., Jiang, G., & Yang, M. (2018). Mean and mean-and-variance corrections with big data. *Structural Equation Modeling, 25*(2), 214–229. doi: 10.1080/10705511.2017.1379012

Zhang, Z., & Yuan, K.-H. (2017 ed.). *Practical statistical power analysis using webpower and R*. Granger, IN: ISDSA Press.

Cain, M., Zhang Z., & Yuan, K.-H. (2017). Univariate and multivariate skewness and kurtosis for measuring nonnormality: Prevalence, influence and estimation. *Behavior Research Methods, 49*, 1716–1735. doi: 10.3758/s13428-016-0814-1

Du, H., Zhang, Z., & Yuan, K.-H. (2017). Power analysis for t-test with non-normal data and unequal variances. In A. van der Ark, D.M., M.Wiberg, S.A.Culpepper, J. A.Douglas, & W.-C.Wang (Eds.), *Quantitative psychology: The 81th Annual Meeting of the Psychometric Society* (pp. 373–380). Switzerland: Springer.

Hayashi, K., Yuan, K.-H., & Liang, L. (2017). On the relationship between squared canonical correlation and matrix norm. In A. van der Ark, D.M., M.Wiberg, S.A.Culpepper, J. A.Douglas, & W.-C.Wang (Eds.), *Quantitative psychology: The 81th Annual Meeting of the Psychometric Society* (pp. 141–150). Switzerland: Springer.

Jiang, G., Mai, Y., & Yuan, K.-H. (2017). Advances in measurement invariance and mean comparison of latent variables: Equivalence testing and a projection-based approach.

Frontiers in Psychology 8:1823. doi: 10.3389/fpsyg.2017.01823

Jiang, G., & Yuan, K.-H. (2017). Four new corrected statistics for SEM with small samples and nonnormally distributed data. *Structural Equation Modeling, 24*, 479–494. doi: 10.1080/10705511.2016.1277726

Marcoulides, K. M., & Yuan, K.-H. (2017). New ways to evaluate goodness of fit: A note on using equivalence testing to assess structural equation models. *Structural Equation Modeling, 24*, 148–153. doi: 10.1080/10705511.2016.1225260

Yuan, K.-H., & Bentler, P. M. (2017). Improving the convergence rate and speed of Fisher-scoring algorithm: Ridge and anti-ridge methods in structural equation modeling. *Annals of the Institute of Statistical Mathematics, 69*, 571–597. doi: 10.1007/s10463-016-0552-2

Yuan, K.-H., Jiang, G., & Cheng, Y. (2017). More efficient parameter estimates for factor analysis of ordinal variables by ridge generalized least squares. *British Journal of Mathematical and Statistical Psychology, 70*, 525–564. doi: 10.1111/bmsp.12098

Yuan, K.-H., Yang, M., & Jiang, G. (2017). Empirically corrected rescaled statistics for SEM with small N and large p. *Multivariate Behavioral Research, 52*(6), 673–698. doi: 10.1080/00273171.2017.1354759

Yuan, K.-H., Zhang, Z., & Zhao, Y. (2017). Reliable and more powerful methods for power analysis in structural equation modeling. *Structural Equation Modeling, 24*, 315–330. doi: 10.1080/10705511.2016.1276836

Deng, L., & Yuan, K.-H. (2016). Comparing latent means without mean structure models: A projection-based approach. *Psychometrika, 81*, 802–829.

Liang, L., Hayashi, K., & Yuan, K.-H. (2016). The goodness of sample loadings of principal component analysis in approximating to factor loadings with high dimensional data. In A. van der Ark, D.M. Bolt, W.-C. Wang, J.A. Douglas, & M. Wiberg (Eds.), *Quantitative psychology research: The 80th Annual Meeting of the Psychometric Society* (pp. 199–211). Switzerland: Springer.

Yang, M., & Yuan, K.-H. (2016). Robust methods for moderation analysis with a two-level regression model. *Multivariate Behavioral Research, 51*, 757–771. doi: 10.1080/00273171.2016.1235965

Yuan, K.-H. (2016). Meta analytical structural equation modeling: Comments on issues with current methods and viable alternatives. *Research Synthesis Methods, 7*, 215–231.

Yuan, K.-H., & Chan, W. (2016a). Measurement invariance via multi-group SEM: Issues and solutions with chi-square-difference tests. *Psychological Methods, 21*(3), 405–426. doi: 10.1037/met0000080

Yuan, K.-H., & Chan, W. (2016b). Structural equation modeling with unknown population distributions: Ridge generalized least squares. *Structural Equation Modeling, 23*(2), 163–179. doi: 10.1080/10705511.2015.1077335

Yuan, K.-H., Chan, W., Marcoulides, G. A., & Bentler, P. M. (2016). Assessing structural equation models by equivalence testing with adjusted fit indices. *Structural Equation Modeling, 23*, 319–330. doi: 10.1080/10705511.2015.1065414

Yuan, K.-H., Chan, W., & Tian, Y. (2016). Expectation-robust algorithm and estimating equations for means and dispersion matrix with missing data. *Annals of the Institute of Statistical Mathematics, 68*, 329–351. doi: 10.1007/s10463-014-0498-1

Zhang, Z., & Yuan, K.-H. (2016). Robust coefficients alpha and omega and confidence intervals with outlying observations and missing data: Methods and software. *Educational and Psychological Measurement, 76*(3), 387–411. doi: 10.1177/0013164415594658

Deng, L., Marcoulides, G., & Yuan, K.-H. (2015). Psychometric properties of measures of team diversity with Likert data. *Educational and Psychological Measurement, 75*, 512–534.

Deng, L., & Yuan, K.-H. (2015). Multiple group analysis for structural equation modeling with dependent samples. *Structural Equation Modeling, 22*, 552–567.

Liang, L., Hayashi, K., & Yuan, K-H. (2015). On closeness between factor analysis and principal component analysis under high-dimensional conditions. In A. van der Ark, D.M. Bolt, W.-C. Wang, J.A. Douglas, & S.-M. Chow (Eds.), *Quantitative psychology research: The 79th Annual Meeting of the Psychometric Society* (pp. 209–221). New York: Springer.

Yuan, K.-H., & Tian, Y. (2015). Structural equation modeling as a statistical method: An overview. *JSM Mathematics & Statistics 2*(1):1006.

Yuan, K.-H., Tian, Y., & Yanagihara, H. (2015). Empirical correction to the likelihood ratio statistic for structural equation modeling with many variables. *Psychometrika, 80*, 379–405. doi: 10.1007/s11336-013-9386-5

Yuan, K.-H., Tong, X., & Zhang, Z. (2015). Bias and efficiency for SEM with missing data and auxiliary variables: Two-stage robust method versus two-stage ML. *Structural Equation Modeling, 22*, 178–192. doi: 10.1080/10705511.2014.935750

Jamshidian, M., & Yuan, K.-H. (2014). Examining missing data mechanisms via homogeneity of parameters, homogeneity of distributions, and multivariate normality. *Wiley Interdisciplinary Reviews: Computational Statistics, 6*, 56–73.

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Recent presentations

Yuan, K.-H. (2023, October). Partial-least-squares structural equation modeling, its properties and applications. Invited Colloquium, Department of Statistics at Harbin Institute of Technology, Harbin, China

Yuan, K.-H. (2023, October). Statistics in practice: Conventional vs new methods. Invited Colloquium, School of Social and Behavioral Sciences at Nanjing University, Nanjing, China.

Yuan, K.-H., Zhang, Z. (2023, July). Modeling data with measurement errors but without predefined metrics: Fact vs fallacy. Invited talk at the 2023 Meeting of the International Society for Data Science and Analytics. Shanghai, China.

Yuan, K.-H. (2023, April). Partial-least-squares structural equation modeling, its properties and applications. Invited Colloquium, School of Statistics at Renmin University of China, Beijing, China.

Yuan, K.-H., & Liu, H. (2022, May-June). Recent advancements of moderation and mediation analyses. Invited talk at the 2022 Meeting of the International Society for Data Science and Analytics. Notre Dame, IN.

Yuan, K.-H., Wen, Y., & Tang, J. (2022, July). Sensitivity analysis of the weights of the composites under partial least-squares approach to structural equation modeling. International Meeting of the Psychometric Society. Bologna, Italy.

Yuan, K.-H., & Liu, H. (2022, October). Recent advancements of moderation and mediation analyses. Annual Meeting of the Society of Multivariate Experimental Psychology. Monterey, CA.

Hayashi, K., Yuan, K.-H., & Sato, R. (2021, July). On estimation of the precision matrix with factor analysis under misspecifications. International Meeting of the Psychometric Society (Virtual).

Highlighted activities

- Conventional methods of moderation analysis regard the effect of interaction as moderation. They also could not distinguish the effect of moderated mediation from that of mediated moderation. Also, the conventional methods of mediation analysis do not have a proper measure of effect size, due to the fact that not all the variability of the mediator contributes to the change of the outcome variable. With Hongyun Liu (a visiting scholar to ND 2018-2019), we proposed new methods in a series of papers that and have addressed all the noted issues.

- Measurement errors and no predefined metrics are key features of data in psychology and social sciences. They created several misconceptions for psychometrics and research methods. By working with collaborators Zhiyong Zhang, Lifang Deng (ND visiting scholar), Youngfei Fang (ND visiting scholar), we have clarified the misconceptions and pointed out what can be done and what need to be done for the analyses of psychological data.

- I have been on the DEI committee for multiple years before taking the 2023 academic leave. I have always been an active supporter and advocate for proposals that matters the department, the university and the community.