Chia-Yi Chiu

Title and Address:

Associate Professor
Department of Educational Psychology
College of Education and Human Development
University of Minnesota
Educational Psychology
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Education

Highest Earned Degree

Ph.D., August 2008
Division of Quantitative and Evaluative Research Methodologies
Department of Educational Psychology
University of Illinois at Urbana-Champaign

Dissertation

Cluster Analysis for Cognitive Diagnosis: Theory and Applications
Dissertation Committee:
    Jeff Douglas (Statistics), Chair and Director
    Carolyn Anderson (Educational Psychology)
    Hua-Hua Chang (Educational Psychology)
    Larry Hubert (Psychology)

Other Earned Degrees

M.S., Statistics, University of Illinois at Urbana-Champaign, May 2006

M.A., Mathematics in Teaching, University of Northern Colorado, May 2000. Module Title: Curriculum Module in Formulation of Geometry Proofs - The Exploration of Congruence

B.S., Mathematics, National Taiwan Normal University, July 1994

Employment History

Positions Held

08/2022-present **Associate Professor**, Quantitative Methods in Education (QME) Program, Department of Educational Psychology, University of Minnesota
07/2016-06/2022 **Associate Professor**, Educational Statistics, Measurement, and Evaluation (ESME) Program, Department of Educational Psychology, Rutgers University
09/2008-06/2016 **Assistant Professor**, Educational Statistics, Measurement, and Evaluation (ESME) Program, Department of Educational Psychology, Rutgers University

06/2007-08/2008 **Research Assistant**, Department of Statistics, University of Illinois at Urbana-Champaign. Source and Title: National Science Foundation, Constrained Finite Mixture Models for Psychological Diagnosis and Educational Assessment

06/2006-08/2007 **Research Assistant**, Department of Medical Informatics, University of Illinois at Urbana-Champaign. Source and Title: Carle Foundation Hospital, Health Monitoring on Patients' Quality of Life with Adaptive Testing

06/2006-08/2006 **Intern**, Division of Research and Development, Educational Testing Service, NJ. Mentors: Dr. Matthias von Davier & Dr. Xulie Xu. Project Title: Concurrent Calibration with General Diagnostic Model for National Assessment of Educational Progress (NAEP) Data

01/2006-05/2006 **Teaching Assistant**, Department of Psychology, University of Illinois at Urbana-Champaign

09/2004-12/2006 **Research Assistant**, Department of Community Health, University of Illinois at Urbana-Champaign. Source and Title: National Cancer Institute, Mammographic Densities: In the Pathway to Breast Cancer?

09/2004-12/2005 **Teaching Assistant**, Department of Educational Psychology, University of Illinois at Urbana-Champaign

08/2000-08/2002 **High School Math Teacher**, Taipei Municipal Chung-Ching Junior High School, Taipei, Taiwan

08/1995-08/1998 **High School Math Teacher**, Taipei Municipal Chung-Ching Junior High School, Taipei, Taiwan

07/1997-09/1997 **Research Assistant, Maryland School Performance Assessment Program**. Department of Mathematics, National Taiwan Normal University, Taipei, Taiwan

08/1993-08/1995 **High School Math Teacher**. Taipei Municipal Ching-Shuei Junior High School, Taipei, Taiwan

Honors and Awards

Fellowships

William Chandler Bagley Scholar Doctoral Fellowship, Spring 2007, College of Education, University of Illinois at Urbana-Champaign.

Professional Awards and Honors

John P. Yackle Professor of Educational Measurement and Assessment, 2022-present, University of Minnesota

Chancellor's Scholar Award: Innovation in Research, 2017-2022, Rutgers University ($5000 research fund/year)

Brenda H. Loyd Outstanding Dissertation Award, 2010, National Council on Measurement in Education (NCME)

Dissertation Award Shortlist, 2009, Classification Society

Conference Travel Award, Fall 2007, Graduate College, University of Illinois at Urbana-Champaign

Conference Travel Grant, Fall 2007, Department of Educational Psychology, University of Illinois at Urbana-Champaign

Conference Travel Grant, Spring 2007, Department of Educational Psychology, University of Illinois at Urbana-Champaign

Conference Travel Award, Spring 2006, Graduate College, University of Illinois at Urbana-Champaign

Funding

Internally-Funded Research and/or Training Grants

2021-2022 (Grant Amount: $25,000), Principal Investigator, Project Title: Building the Infrastructure of a Next-Generation CD-CAT for E-Learning, Dean's Research Fund**,** Graduate School of Education, Rutgers University.

2020-2021 (Grant Amount: $10,000), Principal Investigator, Project Title: Computerized Adaptive Testing for Cognitive Diagnosis in E-Learning: Development of Item Cloning Techniques, Provost Award in Innovations in Education and Teaching Pilot Grant.

2013-2016 (Grant Amount: $8,000), Principal Investigator, Project Title: A General Heuristic Approach to Cognitive Diagnosis, Centers for Global Advancement and International Affairs.

2012-2013 (Grant Amount: $2,500), Principal Investigator, Project Title: Assignment of Clusters to Attribute Profiles for Cognitive Diagnosis, University Research Council Grant.

Externally-Funded Research and/or Training Grants

2016-2023 (Grant Amount: $731,165), Principal Investigator, CAREER: Cognitive Diagnosis in E-Learning: A Nonparametric Approach for Computerized Adaptive Testing, NSF.

2009-2010 (Grant Amount: $335,699), Psychometrician, Development and Application of a Multilevel Evaluation Procedure for Examining State and School Educational Contexts with NAEP, NSF, PI: Camilli, G.

Editorial Activities

Membership on Editorial Boards of Scholarly or Professional Journals

2019-ongoing, Associate Editor, *Psychometrika*

2019-ongoing, Associate Editor, *Journal of Classification*

2014-2017, Editorial Board, *Journal of Educational Measurement*

Publications

Articles in Refereed Journals

Published (* indicates a current or former student co-author)

Chiu, C.-Y., Köhn, H.-F., & Ma, W. (2022). Commentary on "Extending the basic local independence model to polytomous data" by Stefanutti, de Chiusole, Anselmi and Spoto. *Psychometrika*.

Chiu, C.-Y. & Chang, Y.-P.* (2021). Advances in CD-CAT: The general nonparametric item selection method. *Psychometrika, 86*, 1039-1057.

Köhn, H.-F., & **Chiu, C.-Y.** (2021). A unified theory of the completeness of Q-matrices for the DINA model. *Journal of Classification, 38,* 500-518.

Köhn, H.-F., & **Chiu, C.-Y.** (2019). Attribute hierarchy models in cognitive diagnosis: Identifiability of the latent attribute space and conditions for completeness of the Q-matrix. *Journal of Classification, 36,* 541-565.

Chang, Y.-P.*, **Chiu, C.-Y.**, & Tsai, R.-C. (2019). Nonparametric CAT for CD in educational settings with small samples. *Applied Psychological Measurement, 43,* 543-561.

Chiu, C.-Y., & Köhn, H.-F. (2019). Consistency theory for the general nonparametric classification Method. *Psychometrika, 84,* 830-845.

Köhn, H.-F., & **Chiu, C.-Y.** (2018). How to build a complete Q-matrix for a cognitively diagnostic test. *Journal of Classification, 35,* 273-299.

Chiu, C.-Y., Sun, Y.*, & Bian, Y.* (2018). Cognitive diagnosis for small educational programs: The general nonparametric classification method, *Psychometrika, 83*, 355-375.

de la Torre, J., & **Chiu, C.-Y.** (2017). On the consistency of Q-matrix estimation: A rejoinder. *Psychometrika, 82*, 528-529.

Köhn, H.-F., & **Chiu, C.-Y.** (2017). A procedure for assessing the completeness of the Q-matrices of cognitively diagnostic tests. *Psychometrika, 82*, 112-132.

Chiu, C.-Y., Köhn, H.-F., Zheng, Y.*, & Henson, R. (2016). Joint maximum likelihood estimation for cognitive diagnostic models. *Psychometrika, 81,* 1069-1092.

Chiu, C.-Y., Köhn, H.-F., & Wu, H.-M. (2016). Fitting the reduced RUM with Mplus: A Tutorial. *International Journal of Testing, 16,* 331-351.

Köhn, H.-F., & **Chiu, C.-Y.** (2016). A proof of the duality of the DINA model and the DINO model. *Journal of Classification, 33*, 171-184.

Chiu, C.-Y., & Köhn, H.-F. (2016). Consistency of cluster analysis for cognitive diagnosis: The reduced reparameterized unified model and the general diagnostic model. *Psychometrika, 81*, 585-610.

Chiu, C.-Y., & Köhn, H.-F. (2016). The reduced RUM as a logit model: Parameterization and constraints. *Psychometrika, 81,* 350-370.

de la Torre, J., & **Chiu, C.-Y.** (2016). A general method of empirical Q-matrix validation. *Psychometrika, 81*, 253-273.

Chiu, C.-Y., & Köhn, H.-F. (2015). A general proof of consistency of heuristic classification for cognitive diagnosis models. *British Journal of Mathematical and Statistical Psychology, 68,* 387-409.

Chiu, C.-Y., & Köhn, H.-F. (2015). Consistency of cluster analysis for cognitive diagnosis: The DINO model and the DINA model revisited. *Applied Psychological Measurement, 39*, 465-479.

Köhn, H-F., **Chiu, C.-Y.,** & Brusco, M. (2015). Heuristic cognitive diagnosis when the Q-matrix is unknown. *British Journal of Mathematical and Statistical Psychology, 68,* 268-291.

Chiu, C.-Y. (2013). Statistical refinement of the Q-matrix in cognitive diagnosis. *Applied Psychological Measurement, 37,* 598-618.

Chiu, C.-Y., & Douglas, J. (2013). A nonparametric approach to cognitive diagnosis by proximity to ideal response patterns. *Journal of Classification, 30,* 225-250.

Camilli, G., Jackson, D., **Chiu, C.-Y.,** & Gallagher, A. (2011). The mismatch hypotheses in law school admissions. *Widener Journal of Law, Economics & Race, 2*, 165-209.

Camilli, G., de la Torre, J., & **Chiu, C.-Y.** (2010). A non-central t regression model for meta-analysis. *Journal of Educational and Behavioral Statistics, 35*, 125-153.

Chiu, C.-Y., & Seo, M. (2009). Cluster analysis for cognitive diagnosis: An application to the 2001 PIRLS reading assessment. *IERI Monograph Series: Issues and Methodologies in Large-Scale Assessments, 2*, 137-159.

Chiu, C.-Y., Douglas, J., & Li, X. (2009). Cluster analysis for cognitive diagnosis: Theory and applications. *Psychometrika, 74*, 633-665.

Work in Progress

Wang, Y.,* **Chiu, C.-Y.,** & Köhn, H.-F. (under review). Nonparametric classification method for multiple-choice items in cognitive diagnosis. *Journal of Educational and Behavioral Statistics.*

Chiu, C.-Y. Oluwalana, O.,* Köhn, H.-F., & Wang, J.* (under review). A general method for Q-matrix estimation. *Applied Psychological Measurement.*

Chapters in Books or Monographs

Published (* indicates a current or former student co-author)
Chiu, C.-Y. & Köhn, H.-F. (2019). Nonparametric diagnostic classification methods. In M. von Davier & Y.-S. Lee (Eds.), *Handbook of Diagnostic Classification Models - Models and Model Extensions, Applications, Software Packages* (pp. 107-132). New York: Springer.

Köhn, H.-F., & **Chiu, C.-Y.** (2018). Identifiability of the latent attribute space and conditions of Q-matrix completeness for attribute hierarchy models. In M. Wiberg, S. Culpepper, R. Janssen, J. González, & D. Molenaar (Eds.), *Quantitative Psychology: The 82nd Annual Meeting of the Psychometric Society* (pp. 363-375). New York: Springer.

Köhn, H.-F., & **Chiu, C.-Y.** (2016). Conditions of completeness of the Q-matrix of tests for cognitive diagnosis. In L. 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. 255-264). New York: Springer.

Chiu, C.-Y., Köhn, H.-F., Zheng, Y.*, & Henson, R. (2015). Exploring joint maximum likelihood estimation for cognitive diagnosis models. In L. 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. 263-277). New York: Springer.

Köhn, H.-F., **Chiu, C.-Y.,** & Brusco, M. J. (2013). The comparison of two input statistics for heuristic cognitive diagnosis. In R. E. Millsap, L. A. van der Ark, D. M. Bolt, & C. M. Woods (Eds.), *New Developments in Quantitative Psychology: Presentations from the 77th Annual Psychometric Society Meeting* (pp. 335-344). New York: Springer.

Software (* indicates a current or former student co-author)

Chiu, C.-Y., & Ma, W.* (2016). ACTCD: The asymptotic classification theory for cognitive diagnosis, R package version 1.1-0. http://CRAN.R-project.org/package=ACTCD.
Zheng, Y.*, & **Chiu, C.-Y.** (2013). NPCD: Nonparametric methods for cognitive diagnosis, R package version 1.0-4. http://CRAN.R-project.org/package=NPCD.

Proceedings

Köhn, H.-F., & **Chiu, C.-Y**. (2015). Assessing the completeness of the Q-matrix in cognitively diagnostic modeling. In *JSM Proceedings, Social Statistics Section* (pp. 481-487). Alexandria, VA: American Statistical Association.

Works in Preparation (* indicates a current or former student co-author)

Chiu, C.-Y. & Köhn, H.-F. (in preparation). Development of useful and proper distractors for multiple-choice items in cognitive diagnosis. To be submitted to *British Journal of Mathematical and Statistical Psychology.*

Chiu, C.-Y. & Bian, Y.* (in preparation). Advances in cognitive diagnosis: The general nonparametric classification framework for polytomous data. To be submitted to *British Journal of Mathematical and Statistical Psychology.*

Chiu, C.-Y., & Wang, Y.* (in preparation). A note on the classification consistency and accuracy for the nonparametric classification methods in cognitive diagnosis. To be submitted to *Applied Psychological Measurement.*

Chang, Y.-P.* & **Chiu, C.-Y.** (in preparation). A variable-length stopping criterion for nonparametric CD-CAT methods.

Chang, Y.-P.* & **Chiu, C.-Y.** (in preparation). Q-matrix optimality conditions for nonparametric CD-CAT methods. To be submitted to *Applied Psychological Measurement.*

Sun, Y.*, **Chiu, C.-Y.** (in preparation). General Q-matrix refinement in cognitive diagnosis: A nonparametric approach. To be submitted to *Applied Psychological Measurement.*

Conference Presentations, Lectures, Demonstrations

Workshops

Chiu, C.-Y., & Köhn, H.-F., Sorrel, M. A., Nájera, P., Wang, Y.*, & Wang, J.* (2022, April). *Next-generation cognitive diagnosis for small educational testing settings: Innovations and implementation.* Workshop given at the annual meeting of the National Council on Measurement in Education, San Diego, CA.

Chiu, C.-Y. (2021, March). *NSF CAREER Submission - Social Science Perspectives.* Workshop given at the NSF CAREER Proposal Development Workshop Series, The Office for Research's Research Development, Rutgers University.

Chiu, C.-Y., & Köhn, H.-F. (2019, April). *Nonparametric cognitive diagnosis and computerized adaptive testing for small samples.* Workshop given at the annual meeting of the National Council on Measurement in Education, Toronto, Canada.

Chiu, C.-Y. (2018, September). *Cognitive diagnostic methods and item response theory: Introductions and related applications.* Invited workshop given in the department of Psychology at the National Chengchi University, Taipei, Taiwan.

Chiu, C.-Y. (2018, September). *Small sample techniques for cognitive diagnosis.* Invited workshop given in the Graduate Institute of Educational Measurement and Statistics at the National Taichung University of Education, Taichung, Taiwan.

Invited Addresses

Chiu, C.-Y. (2021, December). *Computerized adaptive testing for cognitive diagnosis in e-learning: development of item cloning techniques.* Invited presentation given in the Presidential Inaugural Event, Rutgers University, NJ.

Chiu, C.-Y. (2021, October). *Panel discussion with editors of educational research journals.* Invited as an editor for the Editor Panel Discussion Event, Graduate School of Education, Rutgers University, NJ.

Chiu, C.-Y. (2021, February). *A nonparametric CD-CAT framework and the CATL-CD Web App for Online Learning.* Invited presentation given in the Graduate School of Education at Rutgers University, NJ.

Chiu, C.-Y. (2020, January). *A nonparametric CD-CAT framework for small-scale educational programs.* Invited presentation given in the Educational Psychology department at the University of Kansas, KA.

Chiu, C.-Y. (2019, December). *A nonparametric CD-CAT framework for small-scale educational programs.* Invited presentation given in the Educational Methodology, Policy, and Leadership department at the University of Oregon, OR.

Chiu, C.-Y. (2019, November). *A nonparametric CD-CAT framework for small-scale educational programs.* Invited presentation given in the Psychology department at the University of Illinois at Urbana-Champaign, IL.

Chiu, C.-Y. (2019, June). *Attribute hierarchy models in cognitive diagnosis: Identifiability of the latent attribute space and the Q-matrix.* Talk presented to the 3rd International Conference on Econometrics and Statistics (EcoSta 2019), Taichung, Taiwan.

Chiu, C.-Y. (2018, September). *Nonparametric classification methods for cognitive diagnosis.* Invited presentation given in the Faculty of Education at the Hong Kong University, Hong Kong.

Chiu, C.-Y. (2018, July). *Cognitive diagnosis for small educational programs: The general nonparametric classification method.* Invited presentation given in the 2018 ICSA China Conference, Qingdao, China.

Chiu, C.-Y., & Köhn, H.-F. (2018, June). *A procedure for assessing the completeness of the Q-matrices of cognitively diagnostic tests.* Invited presentation given in the 2nd International Conference on Econometrics and Statistics, Hong Kong, China.

Chiu, C.-Y. , Sun, Y.*, and Bian, Y.* (2016, July). *Cognitive diagnosis for small educational programs: The general nonparametric classification method.* Invited presentation given in the Graduate Institute of Educational Measurement and Statistics at the National Taichung University of Education, Taichung, Taiwan.

Chiu, C.-Y., Köhn, H.-F., Zheng, Y.*, & Henson, R. (2016, June). *Joint maximum likelihood estimation for general cognitive diagnostic models.* Invited presentation given in the Graduate Institute of Educational Measurement and Statistics at the National Taichung University of Education, Taichung, Taiwan.

Chiu, C.-Y., & Köhn, H.-F. (2015, August). *A procedure for assessing the completeness of the Q-matrices of cognitively diagnostic tests.* Paper presented in the invited session of cognitive diagnosis and item response theory at the Joint Statistical Meetings of the American Statistical Association, Seattle, WA.

Chiu, C.-Y. (2015, March). *Recent development in educational testing: From item response theory to cognitive diagnosis.* Invited presentation given in the Department of Psychology at the McGill University, Montreal, Canada.

Chiu, C.-Y., & Köhn, H.-F. (2014, December). *The reduced RUM as a logit model: Parameterization and constraints.* Invited presentation given in the Graduate Institute of Educational Measurement and Statistics at the National Taichung University of Education, Taichung, Taiwan.

Chiu, C.-Y. (2014, August). *Joint maximum likelihood estimation for cognitive diagnosis.* Paper presented in the invited session of cognitive diagnosis and item response theory at the Joint Statistical Meetings of the American Statistical Association, Boston, MA.

Chiu, C.-Y. (2013, June). *Nonparametric approaches to cognitive diagnosis.* Paper presented in the invited workshop in the Graduate Institute of Educational Measurement and Statistics at the National Taichung University of Education, Taichung, Taiwan.

Chiu, C.-Y. (2013, June). *Statistical refinement of the Q-matrix in cognitive diagnosis.* Paper presented in the invited workshop in the Graduate Institute of Educational Measurement and Statistics at the National Taichung University of Education, Taichung, Taiwan.

Chiu, C.-Y. (2013, June). *Joint maximum likelihood estimation for CDMs.* Paper presented in the invited workshop in the Graduate Institute of Educational Measurement and Statistics at the National Taichung University of Education, Taichung, Taiwan.

Chiu, C.-Y. (2013, January). *Statistical refinement of the Q-matrix in cognitive diagnosis.* Invited presentation given in the Graduate Institute of Educational Measurement and Statistics at the National Taichung University of Education, Taichung, Taiwan.

Chiu. C.-Y. (2012, October). *Nonparametric classification and Q-matrix refinement methods in cognitive diagnosis.* Invited presentation given in the Department of Mathematics and Statistics at the City University of New York, New York City, NY.

Chiu, C.-Y. (2012, July). *Heuristic approaches to cognitive diagnosis: Cluster analysis and nonparametric methods.* Invited presentation given in the Graduate Institute of Educational Measurement and Statistics at the National Taichung University of Education, Taichung, Taiwan.

Chiu, C.-Y. (2012, February). *Nonparametric classification and Q-matrix refinement methods in cognitive diagnosis.* Invited presentation given in the Department of Psychology at the Fordham University, New York City, NY.

Chiu, C.-Y. (2011, August). *Flexible approaches to cognitive diagnosis: Nonparametric methods and small sample techniques.* Paper presented in the invited session of cognitive diagnosis and item response theory at the Joint Statistical Meetings of the American Statistical Association, Miami Beach, FL.

Chiu, C.-Y. (2011, April). *Cluster analysis for cognitive diagnosis: Theory and applications.* Paper presented in the invited session of award winning papers at the annual meeting of the National Council on Measurement in Education, New Orleans, LA.

Chiu, C.-Y. (2009, June). *Cluster analysis for cognitive diagnosis: Theory and applications.* Paper presented in the invited session of dissertation award nominee papers at the annual meeting of the Classification Society, St. Louis, MO.

Chiu, C.-Y. (2009, June). *Finding the number of groups and labeling clusters in cognitive diagnosis.* Paper presented in the invited session at the annual meeting of the Classification Society, St. Louis, MO.

Papers, Abstracts, and Lectures (* indicates a current or former student co-author)

Wang, J.* & **Chiu, C.-Y.** (2022, April). *To use or not to use: Necessity of model selections in CD.* Paper presented at the virtual annual meeting of the National Council on Measurement in Education.

Wang, Y.*, **Chiu, C.-Y.**, & Köhn, H. F. (2021, July). *Nonparametric classification method for multiple-choice items in cognitively diagnostic assessments.* Paper presented at the virtual annual meeting of the Psychometric Society.

Nájera, P.*, Abad, F., **Chiu, C.-Y**., & Sorrel, M. (2021, July). *Deriving posterior probabilities from the nonparametric classification method.* Paper presented at the virtual annual meeting of the Psychometric Society.

Wang, Y.*, **Chiu, C.-Y.**, & Köhn, H. F. (2021, June). *Nonparametric classification method for multiple-choice items in cognitive diagnosis.* Paper presented at the virtual annual meeting of the National Council on Measurement in Education.

Wang, J.*, **Chiu, C.-Y.**, Köhn, H. F., & Oluwalana, O. (2021, June). *A general method for Q-matrix estimation.* Paper presented at the annual meeting of the National Council on Measurement in Education, Online.

Chiu, C.-Y., & Chang, Y.-P.* (2019, June). *Advances in CD-CAT: The general nonparametric item selection method,* Paper presented at the annual meeting of the International Association for Computerized Adaptive Testing, Minneapolis, MN.

Chiu, C.-Y., & Chang, Y.-P.* (2019, April). *A general nonparametric CD-CAT for small educational programs.* Paper presented at the annual meeting of the National Council on Measurement in Education, Toronto, Canada.

Chang, Y.-P.*, & **Chiu, C.-Y.** (2018, July). *General nonparametric item selection algorithm for CD-CAT in small educational settings.* Paper presented at the annual meeting of the Psychometric Society, New York, NY.

Chang, Y.-P.* & **Chiu, C.-Y.** (2018, April). *Nonparametric computerized adaptive testing for cognitive diagnosis in small educational settings.* Paper presented at the annual meeting of the National Council on Measurement in Education, New York, NY.

Sun, Y.*, **Chiu, C.-Y.**, & Bian, Y.* (2018, April). *The general Q-matrix refinement method.* Paper presented at the annual meeting of the National Council on Measurement in Education, New York, NY.

Chang, Y.-P.*, **Chiu, C.-Y.**, & Tsai, R.-C. (2017, August). *Computerized adaptive testing for cognitive diagnosis in classroom: A nonparametric approach.* Paper presented at the annual meeting of the International Association for Computerized Adaptive Testing, Niigata, Japan.

Chang, Y.-P.*, **Chiu, C.-Y.**, & Tsai, R.-C. (2017, July). *Computerized adaptive testing for cognitive diagnosis in classroom: A nonparametric approach.* Paper presented at the annual meeting of the Psychometric Society, Zurich, Switzerland.

Köhn, H.-F. & **Chiu, C.-Y.** (2017, July). *Latent attribute space identifiability and Q-matrix completeness for cognitively diagnostic models with attribute hierarchies.* Paper presented at the annual meeting of the Psychometric Society, Zurich, Switzerland.

Chiu, C.-Y., Sun, Y.*, & Bian, Y.* (2017, April). *Cognitive diagnosis for small educational programs: The general nonparametric classification method.* Paper presented at the annual meeting of the National Council on Measurement in Education, San Antonio, TX.

Sun, Y.*, **Chiu, C.-Y.**, & Bian, Y.* (2016, July). *General Q-matrix refinement in cognitive diagnosis: A nonparametric approach.* Paper presented at the annual meeting of the Psychometric Society, Asheville, NC.

Chiu, C.-Y., & Köhn, H.-F. (2015, December). *Joint maximum likelihood estimation for general cognitive diagnostic models.* Paper presented at the annual meeting of the 2015 Global Chinese Conference on Educational Information and Assessment Chinese Association of Psychological Testing 2015 Annual Conference, Taichung, Taiwan.

Sun, Y.*, & **Chiu, C.-Y.** (2015, July). *A general nonparametric classification method for cognitive diagnosis.* Paper presented at the annual meeting of the Psychometric Society, Beijing, China.

Chiu, C.-Y., & Köhn, H.-F. (2015, April). *The reduced RUM as a logit model: A demonstration via Mplus.* Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago, IL.

Oluwalana, O.*, **Chiu, C.-Y.**, & Williams, I.* (2015, April). *Evaluating the use of principal component analysis in Q-matrix construction.* Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago, IL.

Chiu, C.-Y., & Köhn, H.-F. (2014, August). *The reduced RUM as a logit model: Parameterization and constraint.* Paper presented at the Cross-Strait Psychometric Conference, Taichung, Taiwan.

Chiu, C.-Y., Zheng, Y.*, & Henson, R. (2014, July). *Joint maximum likelihood estimation for cognitive diagnosis.* Paper presented at the annual meeting of the Psychometric Society, Madison, WI.

Chiu, C.-Y. (2013, July). *Statistical refinement of the Q-matrix in cognitive diagnosis*. Paper presented at the annual meeting of the Psychometric Society, Arnhem, The Netherlands.

Chiu, C.-Y. (2012, April). *The G-DINA model discrimination Index for provisional Q-vectors.* Paper presented in the training session at the annual meeting of the National Council on Measurement in Education, Vancouver, Canada.

Chiu, C.-Y. (2011, July). *A model-free approach to cognitive diagnosis: Robustness under misspecification and implications for latent structure identification*. Paper presented at the annual meeting of the Psychometric Society, Hong-Kong.

de la Torre, J., & **Chiu, C.-Y.** (2010, May). *The G-DINA model discrimination index for provisional Q-vectors.* Paper presented at the annual meeting of the National Council on Measurement in Education, Denver, CO.

Chiu, C.-Y. (2009, July). *Stopping and labeling rules with clusters analysis for cognitive diagnosis.* Paper presented at the annual meeting of the Psychometric Society, Cambridge, England.

Chiu, C.-Y. (2008, July). *Cluster analysis for cognitive diagnosis: A robustness study in relation to model misspecification.* Paper presented at the annual meeting of the Psychometric Society, Durham, NH.

Chiu, C.-Y. (2008, March). *Cluster analysis for cognitive diagnosis: Relationships with latent class analysis and applications.* Paper presented at the annual meeting of the National Council on Measurement in Education, New York City, NY.

Douglas, J., & **Chiu, C.-Y.** (2007, October). *Cluster analysis approaches for cognitive diagnosis.* Paper presented at the International Conference on Advances in Interdisciplinary Statistics and Combinatorics, Greensboro, NC.

Chiu, C.-Y. (2007, July). *Relationship between cluster analysis and latent class analysis for cognitive diagnosis.* Paper presented at the annual meeting of the Psychometric Society, Tokyo, Japan.

Chiu, C.-Y., & Douglas, J. (2007, June). *Connection between cluster analysis and restricted latent class analysis.* Paper presented at the annual meeting of the Classification Society of North America, Urbana-Champaign, IL.

Chiu, C.-Y., Xu, X., & von Davior, M. (2007, April). *Linking with General Diagnosis Model.* Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago, IL.

Douglas, J., & **Chiu, C.-Y.** (2007, April). *Relationships between competing latent variable models: Implications of model misspecification*. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago, IL.

Chiu, C.-Y., Xu, X., & von Davior, M. (2006, October). *Concurrent calibration with GDM for NAEP data*. Paper presented in the Department of Educational Psychology at the University of Illinois at Urbana-Champaign, IL.

Chiu, C.-Y., Xu, X., & von Davior, M. (2006, August). *Concurrent calibration with GDM for NAEP data.* Paper presented in the ETS Summer Internship program, Princeton, NJ.

Chiu, C.-Y. (2006, April). *Comparison of updated estimation methods for moderated SEM.* Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Chiu, C.-Y. (2005, September). *Comparison of updated estimation methods for moderated SEM - Literature review.* Paper presented in the Department of Educational Psychology at the University of Illinois at Urbana-Champaign, IL.

Teaching Activities

Courses Taught

University of Minnesota:
> Methods in Data Analysis for Educational Research I

Rutgers University:
> Quantitative Research Methods in Education II: ANOVA
>
> Causal Modeling (Structural Equation Modeling)
>
> Quantitative Method I
>
> Psychometric Theory I
>
> Statistical Methods I (face-to-face and online)
>
> Statistical Methods II (face-to-face and online)

University of Illinois at Urbana-Champaign (as a TA):
> Measurement and Test Development
>
> Multivariate Analysis in Psychology and Education
>
> Statistical Inference in Education

Students Supervised

Doctoral Students by Type of Supervision

<u>Chair and Director - Completed</u>

Olasumbo Oluwalana, Ph.D., Dissertation title: New approaches to Q-matrix validation and estimation for cognitive diagnosis models, Department of Educational Psychology, September 2016 - May 2019

La Reina Bates, Ph.D., Dissertation title: An event history analysis of time to degree completion, Department of Educational Psychology, September 2011 - May 2012.

<u>Chair - Completed</u>

Yan Sun, Ph.D., Dissertation title: Strategies for Addressing High Dimensional Cognitively Diagnostic Assessment Problems, Department of Educational Psychology, March 2017 – May 2019.

Wenchao Ma, Ph.D., Dissertation title: A sequential cognitive diagnosis model for graded response: model development, Q-matrix validation and model comparison, Department of Educational Psychology, February 2016 - August 2017.

Nathan Minchen, Ph.D., Dissertation title: Continuous response in cognitive diagnosis models: Response time modeling, computerized adaptive testing, and Q-matrix validation, Department of Educational Psychology, February 2016 - August 2017.

<u>Chair - with Signed Proposal</u>

<u>Chair and Director - Working on Proposal</u>

<u>Member - Completed</u>

Colleen Belmonte, Ph.D., Dissertation title: Teacher interpretation and application of behavioral data throughout the RTI process, Department of Educational Psychology, January 2018 – March, 2019.

Alyssa May, Ed.D., Dissertation title: The Effect of A Teacher Designed Kindergarten Curriculum on the Reading Performance of English Language Learners, Department of Educational Policy, March 2017 - August 2019.

Eugene Geis, Ph.D., Dissertation title: The Stochastic Approximation Expectation Maximization Algorithm For Fast, High-Dimension, Large-Scale Factor Analysis With Applications To Item Response Theory On Dichotomous and Polythomous Data, Department of Educational Psychology, March 2016 - August 2019.

Paulette F. Del Rosso, Ph.D., Dissertation title: Social Contexts, Academic Effort and Adolescent Expectations of Future Success: A Comparison of Structural Equation Models, Department of Educational Psychology, February 2015 - May 2019.

Paul Rafalowski, Ed.D., Dissertation title: The career aspiration of females and males in a high performing stem-based career academy vocational high school, Department of Educational Policy, March 2017 - May 2019.

Rugip Terzi, Ph.D., Dissertation title: New Q-matrix validation procedures, Department of Educational Psychology, February 2016 - August 2017.

Charlie Iaconangelo, Ph.D., Dissertation title: Uses of classification error probabilities in the three-step approach to estimating cognitive diagnosis models, Department of Educational Psychology, December 2015 - August 2017.

Immanuel Williams, Ph.D., Dissertation title: A speededness item response model for associating ability and speededness parameters, Department of Educational Psychology, October 2015 - August 2017.

Lokman Akbay, Ph.D., Dissertation title: Approaches to estimating hierarchical attribute structures, Department of Educational Psychology, August 2015 - August, 2017.

Rosa Aghekyan, Ph.D., Dissertation title: Exploring high school students' science identities, motivation in science and environmental attitudes, Department of Educational Psychology, February 2017 - May 2017.

Mehmet Kaplan, Ph.D., Dissertation title: New item selection and test administration procedures for cognitive diagnostic computerized adaptive testing, Department of Educational Psychology, May 2014 - October 2015.

Soo Youn Lee, Ph.D., Dissertation title: Lord's Wald test for detecting DIF in multidimensional IRT models: A comparison of two estimation approaches, Department of Educational Psychology, May 2014 - May 2015.

Lynne Kowski, Ph.D., Dissertation title: Rising to the challenge: Postsecondary developmental mathematics and college success, Department of Educational Psychology, November 2012 - November 2014.

Stephanie Wisnicki, Ed.D., Dissertation title: Diffusion of Google Docs in middle schools, Graduate Program in Supervision and Administration in Education, September 2012 - December 2013.

Steve Tetreault, Ed.D., Dissertation title: The diffusion of Google Docs into Monmouth county middle schools, Graduate Program in Supervision and Administration in Education, September 2012 - December 2013.

Jeanette DeCastro, Ph.D., Dissertation title: Meta-analysis of predictors of dental school performance, UMDNJ-NJ Dental School, May 2010 - May 2012.

Ting-Wei Chiu, Ph.D., Dissertation title: Correction for guessing in the framework of the 3PL item response theory, Department of Educational Psychology, May 2009 - May 2010.

<u>Member - with Signed Proposal</u>
Kimberly Dustman, Ph.D., Dissertation Title: An Analysis of Gender Wage Gap and Satisfaction in Legal Private Practice, Department of Educational Psychology, May 2020 – present.

Master's Students by Type of Supervision

<u>Chair and Director - Completed</u>
Yuan-Pei Chang, Master, Thesis title: Computerized adaptive testing for cognitive diagnosis in classroom: A nonparametric approach, Mathematics Department, National Taiwan Normal University, Taiwan, June 2016 - July 2017.

Memberships

Membership/Offices Held in Scholarly and Professional Societies

2010-ongoing: American Statistical Association (ASA)

2007-ongoing: Classification Society

2007-ongoing: Psychometric Society

2006-ongoing: American Education Research Association (AERA)

2006-ongoing: National Council on Measurement in Education (NCME)

Service

Contributions to the Advancement of the Academic Profession

06/2019, Session Coordinator, The 3rd International Conference on Econometrics and Statistics (EcoSta 2019), Taichung, Taiwan.

2018-ongoing, Member, Robert L. Linn Distinguished Address Award, American Education Research Association (AERA) Division D

2015-2018, Member, Quantitative Dissertation Award Committee, American Education Research Association (AERA) Division D

2015-2016, Member, Review Committee, National Council on Measurement in Education (NCME)

2013-2014, Member, Review Committee, National Council on Measurement in Education (NCME)

Ad-Hoc Review Service

2021-ongoing: *Behaviormetrika*

2020-ongoing: *Multivariate Behavioral Research*

2019-ongoing: *The Annals of Applied Statistics*

2018-ongoing: *Journal of Mathematical Psychology*

2015-ongoing: *International Journal of Testing*

2014-ongoing: *Journal of Classification*

2013-ongoing: *Psychometrika*

2012-2013: *IERI Monograph Series*

2011-ongoing: *Applied Psychological Measurement*

2011-ongoing: *Journal of Educational and Behavioral Statistics*

2011-2012, 2015-ongoing: National Science Foundation (NSF)

2010-ongoing: *Journal of Educational Measurement*

Service to Rutgers University

03/2022-05/2022, Member, Appointment and Promotion Committee, Search for Assistant Professor of Urban Education/Language Teacher Education, Graduate School of Education

03/2022-05/2022, Member, Appointment and Promotion Committee, Search for Assistant Professor of Higher Education, Graduate School of Education

10/2021, Chair, Appointment and Promotion Committee, Faculty Application for Promotion to Associate Professor with Tenure, Graduate School of Education

09/2021-05/2022, Member, Rutgers University–New Brunswick Academic Master Plan (NB-AMP) Working Group Steering Committee, Subcommittee 3A: Innovative Research, Rutgers University

09/2021-05/2022, Member, Planning and Resources Committee, Graduate School of Education

02/2021, Member, Reading Committee, Reappointment of Assistant Professor of Educational Psychology, Graduate School of Education

03/2020, Member, Appointment and Promotion Committee, Search for Assistant Professor of Urban Teacher Education & Social Justice: Language Education, Graduate School of Education

02/2020-03/2020, Member, Peer Evaluation Committee (PEC) for Faculty Compensation Program, Graduate School of Education

09/2019-05/2022, Member, Methodology Committee, Graduate School of Education

05/2019-06/2022, Program Coordinator, Educational Statistics, Measurement, and Evaluation program, Graduate School of Education

01/2019-05/2022, Member, Ph.D. Executive Committee, Graduate School of Education

09/2017-02/2018, Member, Qualifying Exam Committee, Special Education Program, Department of Educational Psychology

09/2016-05/2022, Member, Ph.D. Core Requirement Committee, Graduate School of Education

10/2016-12/2016, Co-Chair, Search Committee of Educational Theory, Policy, and Administration, Graduate School of Education

11/2015-05/2022, Member, Ph.D. Program Committee, Graduate School of Education

09/2012-08/2015, Member, Commencement Committee, Graduate School of Education

09/2010-01/2011, Member, Commencement Committee, Graduate School of Education

01/2017-05/2017, Program Coordinator, Department of Educational Psychology

09/2015-08/2016, Chair, the Admission Committee, Department of Educational Psychology

09/2016-05/2022, Member, the Admission Committee, Department of Educational Psychology

09/2012-08/2015, Member, Resource Committee, Department of Educational Psychology

09/2009-08/2012, Member, Admission Committee, Department of Educational Psychology

09/2013-05/2022, Member, Qualifying Exam Committee, ESME Program, Department of Educational Psychology
09/2015-05/2022, Chair, Qualifying Exam Committee, ESME Program, Department of Educational Psychology