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Purdue University
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EDUCATION

1992	University of Illinois at Urbana-Champaign	Ph.D.	Statistics
1988	University of Illinois at Urbana-Champaign	M.S.	Statistics
1980	East China Normal University, Shanghai, China	Diploma	Mathematics

EMPLOYMENT HISTORY

2021 August- Professor of Statistics (Courtesy Appointment), Department of Statistics, Purdue University

2018 August- Charles R. Hicks Chair Professor, Department of Educational Studies, Purdue University

2013- 2017 Director of Confucius Institute, University of Illinois at Urbana-Champaign (UIUC)

2009-2018 Professors of Educational Psychology (67%), Psychology (33%), and Statistics (0%), UIUC

2005-2009 Associate Professors of Educational Psychology (67%), Psychology (33%), and Statistics (0%), UIUC

2001- 2005 Associate Professor, Department of Educational Psychology, University of Texas, Austin, TX

1999 –2001 Senior Psychometrician and Director of Computerized Testing Technological Research, National Board of Medical Examiners, Philadelphia, PA

1997- 1998 Associate Professor, Department of Educational Psychology, The Chinese University of Hong Kong, China

1992-1999 Associate Research Scientist and Research Scientist, Division of Statistics and Psychometrics Research, Educational Testing Service, Princeton, NJ

PROFESSIONAL ACTIVITIES

Recognition and Honor Received After August 2018

1. *Award for Career Contributions to Educational Measurement* (2021), National Council on Measurement in Education (NCME) ¹
2. *Fulbright Specialist Award* (2019), Colombia Fulbright Commission and U.S. Department of State
3. *Fellow of the American Statistical Association* (2019-)
4. *Honorary Chair Professor*, National Sun Yat-sen University, Kaohsiung Taiwan (2018-)
5. *Honorary Professor*, Northeast Normal University, Changchun China (2019-2024)
6. *Honorary Chair Professor*, Beijing Normal University, Beijing China (2017-2020)
7. *Professor Emeritus*, the University of Illinois at Urbana-Champaign (October 2018-)

Recognition and Honors Received Before 2018

8. *E.F. Lindquist Award for Outstanding Applied or Theoretical Research in the Field of Testing and Measurement*, by the American Educational Research Association and the American College Testing Program (2017)²
9. *Robert Bohrer Lecturer in Statistics*, UIUC (2014)
10. *Editor in Chief, Applied Psychological Measurement* (2011-2019)
11. *List of Teachers Ranked as Excellent by Their Students*, UIUC (annually 2008-2018)
12. *Award for Outstanding Graduate Teaching*, College of Education, UIUC (2016)
13. *Chang Jiang Scholar Chair Professor*, Ministry of Education of China (2013-2016)
14. *Commencement Speaker, School of Educational Sciences*, East China Normal University, June 16, 2014, Shanghai China
15. *President*, the Psychometric Society (2012-2013)
16. *Award for Significant Contribution to Educational Measurement and Research Methodology*, Division D, American Educational Research Association (2011)
17. *Distinguished Senior Scholar Award*, College of Education, UIUC (2010)
18. *Fellow of the American Educational Research Association* (2010)³
19. *International Keynote Speaker. The 25th Workshop on Item Response Theory and Educational Measurement*, University of Twente, The Netherlands (2009)
20. *Annual Award*, National Council on Measurement in Education (2008)
21. *Public Presenter Award*, American College Testing, Iowa City, Iowa (2006)
22. *Hire for Excellence*, UIUC (2005)
23. *Fulbright Senior Specialist Award* (2005), Australian-American Fulbright Commission and U.S. Department of State
24. *International Keynote Speaker. The 11th Workshop on Item Response Theory and Educational Measurement*, University of Twente, The Netherlands (1995)

RESEARCH GRANTS

¹ This award is recognized by US News & World Report as one of its ranking factors for Schools of Education.

² This award is recognized by US News & World Report as one of its ranking factors for Schools of Education.

³ This award is recognized by AAU.

Awarded

Grants Received After August 2018

2019-2024	Co-PI (PI: Nielsen Pereira)	\$2,172,719
Funding Agency:	US Department of Education	
Proposal Title:	The Javits Gifted and Talented Students Education Program Closing Excellence and Opportunity Gaps for Students from Traditionally Underserved Populations in Gifted Education: A Multi-Tier Systems of Support Approach	

Grants Received Before 2018

2016-2019	Co-PI (PI: Georgios Fellouris)	\$380,000
Funding Agency:	National Science Foundation (NSF)	
Proposal Title:	Modeling and detection of learning in cognitive diagnosis	
2013-2017	Principal Investigator	\$1,034,960,
Funding Agency:	The Office of Chinese Language Council International, Beijing China.	
Proposal Title:	Chinese Proficiency language Testing Research and Outreach activities	
2013-2015	Co-PI (PI- Jose Mestre)	\$499,936
Funding Agency:	NSF	
Proposal Title:	Using computer adaptive testing (CAT) to improve STEM learning, test performance, and retention	
2012-2013	Principal Investigator	\$69,345
Funding Agency:	CTB/McGraw Hill	
Proposal Title:	Mutual information item selection method in cognitive diagnostic computerized adaptive testing	
2011-2012	Principal Investigator	\$87,146
Funding Agency:	CTB/McGraw Hill	
Proposal Title:	A New Model for Cognitive Diagnostic Computer-Adaptive Testing: An IRT-Based Continuous Conjunctive Latent Trait Diagnostic Modeling Approach	
2011-2014	Co-PI (PI: Bill Cope)	\$659,375
Funding Agency:	Institute of Educational Sciences (IES)	
Proposal Title:	Assessing Complex Performance: A Postdoctoral Training Program Researching Students Writing and Assessment in Digital Workspaces	
2010-2012	Co-PI (PI: Jeff Douglass)	\$262,532
Funding Agency:	NSF, Division of Social & Economic Sciences	

Proposal Title:	Advances in Computerized Adaptive Testing: Modeling Response Times and Constraint Management for Skills Diagnosis	
2010-2010	Principal Investigator	\$65,633
Funding Agency:	CTB/McGraw Hill	
Proposal Title:	Implementing Cognitive Diagnosis in Large Scale Assessment	
2009-2010	Principal Investigator	\$62,344
Funding Agency:	CTB/McGraw Hill	
Proposal Title:	Combing CAT with Cognitive Diagnosis	
2008-2013	Co-PI (PI: Katherine Ryan).	\$1,250,000
Funding Agency:	Illinois State Board of Education	
Proposal Title:	External Review of the ISBE Large Scale Assessment and Accountability System	
2010-2015	Senior Personnel (PI: Sarah Lubienski).	\$655,000
Funding Agency:	IES	
Proposal Title:	UIUC Postdoctoral Research Training Program in Mathematics Education	
2009-2012	Senior Personnel (PI: Bill Cope)	\$1,500,000
Funding Agency:	IES	
Proposal Title:	The Assess-As-You-Go Writing Assistant: A Student Work Environment That Brings Together Formative and Summative Assessment	
2003-2005	Principal Investigator	\$180,000
Funding Agency:	NSF	
Proposal Title:	Improving Computerized Adaptive Testing in the United States.	
2004-2005	Principal Investigator	\$120,000
Funding Agency:	College Board	
Proposal Title:	Cognitive Diagnostic Research.	
2002-2004	Principal Investigator	\$77,943
Funding Agency:	US Department of Education	
Proposal Title:	Improving the DIF Detection Procedures for NAEP Data Analysis.	

Grants Currently Pending

2022-2026	Principal Investigator	
Funding Agency:	IES	
Proposal Title:	Building a Computerized Adaptive Testing Powered Diagnostic Tool to Improve Classroom Assessment in Large College Gateway Courses	

2022-2025 Principal Investigator
Funding Agency: Spencer Foundation
Proposal Title Building a Smart Assessment Tool to Improve Classroom Assessment in Large Introductory STEM Courses

2022-2025 Co-PI
Funding Agency NSF
Proposal Title: Individualizing Instruction and Improving Research using Adaptive Testing (i3RAT)

Grants Awarded for Students

2013 Graduate Student Research Grant from the College Board (Rui Guo)	\$27,000
2010 Graduate Student Research Grant from the College Board (Usama Ali)	\$25,000
2005 Graduate Student Research Grant from the College Board (Ying Cheng)	\$23,500
2004 Graduate Student Research Grant from the College Board (Ying Cheng)	\$23,000
2003 Graduate Students Research Grants from Educational Testing Service.	\$12,000

PUBLICATIONS

Research Papers in Refereed Journals (SELECTED)

Published After 2018

1. **Chang, H-H.**, Wang, C., & Zhang, S. (2021). Statistical applications in educational measurement. Annual Review of Statistics and Its Application. doi.org/10.1146/annurev-statistics-042720-104044. (With Student)
2. Wu, X., Wu, R., Zhang, Y., Arthur, & **Chang, H-H.** (2021). Research on construction method of learning paths and learning progressions based on cognitive diagnostic assessment. Assessment in Education: Principles, Policy & Practice. DOI:10.1080/0969594X.2021.1978387. (With Student)
3. Zhu, Z. & **Chang, H-H.** (2021). Application and prospect of cognitive diagnostic computerized adaptive testing. Journal of China Examination, 345, 41-46.
4. Li, X., Xu, H., Zhang, J., & **Chang, H-H.** (2021). Optimal hierarchical learning path design with reinforcement learning. Applied Psychological measurement. DOI: 10.1177/0146621620947171. (With Student)
5. Wu, X., **Chang, H-H.** (2021) A comparative study on cognitive diagnostic assessment of mathematical key competencies and learning trajectories -- PISA data analysis based on 19, 454 students from 8 countries. Current Psychology. DOI:10.1007/s12144-020-01230-0
6. Wu, X., Wu, R., **Chang, H-H.**, Kong, Q., & Zhang, Y. (2020). International comparative study on PISA mathematics Achievement test based on cognitive diagnostic models. Frontier In Psychology, 09 September 2020, <https://doi.org/10.3389/fpsyg.2020.02230>

7. Kang, H., Zheng, Y., & **Chang, H-H.** (2020). Online calibration of a joint model of item responses and response times in computerized adaptive testing. *Journal of Educational and Behavioral Statistics*, 45, 175-208.
8. Zhang, S. & **Chang, H-H.** (2019). A multilevel logistic Hidden Markov model for learning under cognitive diagnosis. *Behavior Research Methods*. DOI 10.3758/s13428-019-01238-w. (With Student)
9. Choe, M. E. & **Chang, H-H.** (2019). The asymptotic distribution of average test overlap rate in computerized adaptive testing. *Psychometrika*, <https://doi.org/10.1007/s11336-019-09674-5>. (With Student)
10. Li, X., Zhang, J., & **Chang, H-H.** (2019). Look-ahead content balancing method in variable length computerized classification testing. *British Journal of Mathematical and Statistical Psychology*. DOI 10.1111/bmsp.12161. (With Student)
11. Wang, S., Fellouris, G., & **Chang, H-H.** (2019). Statistical foundations for computerized adaptive testing with revision. *Psychometrika*. 84 (2), pp 375–394. (With Student)
12. Kern, J. L., Choe, E. M., and **Chang, H-H.** (Conditionally accepted). Using response times to improve estimation in CAT with a joint maximum a posteriori estimator. (With Student)
13. Tu, D., Wang, S., Douglas, J. & **Chang, H-H.** (2019). Cognitive diagnostic models with attribute hierarchies: Model estimation with a restricted Q matrix design. *Applied Psychological Measurement*, 43 (4), 255–271. (With Student)
14. Lin, C.L., & **Chang, H-H.** (2019). Item selection criteria with practical constraints in cognitive diagnostic computerized adaptive testing. *Educational and Psychological Measurement*, 79(2), 335–357.
15. Chen, Y. & **Chang, H-H.** (2018). Psychometrics help learning: From assessment to learning. *Applied Psychological Measurement*, 42(1) 3–4.
16. Kang, H., Su, Y., & **Chang, H-H.** (2018). A note on monotonicity of item response functions for ordered polytomous item response theory models. *British Journal of Mathematical and Statistical Psychology*, 71, 523–535. (With Student)
17. Choe, E., Zhang, J., & **Chang, H-H.** (2018). Sequential detection of compromised items using response times in computer adaptive testing. *Psychometrika*, 83 (3), 650-673. (With Student)
18. Morphew, J., Mestre, J., Kang, H., **Chang, H-H.**, & Fabry, G. (2018). Using computer adaptive testing to assess physics proficiency and improve exam performance. *Physical Review Physics Education Research*, DOI: 10.1103/PhysRevPhysEducRes.14.010127. (With Student)

Published Before 2018

19. Wang, W. & **Chang, H-H.** (2017). A practical view of test fairness to improve equity in education from statistical measurement. *Journal of Jiangxi Normal University (Natural Science)*, Vol 41 (4), 383-393.

20. Wang, S., Fellouris, G, & **Chang, H-H.** (2017). Computerized adaptive testing that allows for response revision: design and asymptotic Theory. *Statistica Sinica*, 27, 1987-2010
21. Kang, H., Zhang, S., & **Chang, H-H.** (2017). Dual-objective item selection criteria in cognitive diagnostic computerized adaptive testing. *Journal of Educational Measurement*, Vol. 54, No. 2, pp. 165–183.
22. Chen, P., Wang, C., Xin, T., & **Chang, H-H.** (2017) Developing new online calibration methods for multidimensional computerized adaptive testing. *British Journal of Mathematical and Statistical Psychology* (2017), 70, 81–117.
23. Kang, H.-A., Lu, Y., & **Chang, H-H.** (2017). IRT item parameter scaling for developing new item pools. *Applied Measurement in Education*. *Applied Measurement in Education*, Vol. 30, No. 1, 1–15.
24. Kang, H.-A. & **Chang, H-H.** (2016). Parameter drift detection in multidimensional computerized adaptive testing based on informational distance/divergence Measures. *Applied Psychological Measurement*, Vol. 40(7) 534–550.
25. Zhang, S., **Chang, H-H.** (2016). From Smart Testing to Smart Learning: How Testing Technology Can Assist the New Generation of Education. *International Journal of Smart Technology and Learning*, Vol. 1, No. 1, pp.67-92.
26. Wang, S., Lin, H., **Chang, H.-H.**, & Douglas, J. (2016). Hybrid computerized adaptive testing: from group sequential design to fully sequential design. *Journal of Educational Measurement*, Vol. 53 (1), 45-62.
27. **Chang, H.-H.** & Wang, W. (2016). “Internet plus” measurement and evaluation, a new way for adaptive testing. *Journal of Jiangxi Normal University (Natural Science)*, Vol 40 (5), 441-455.
28. Zheng, C. & **Chang, H-H.** (2016). High-efficiency response distribution–based item selection algorithms for short-length cognitive diagnostic computerized adaptive testing. *Applied Psychological Measurement*, Vol 40 (8), 608-624.
29. **Chang, H.-H.** (2015). Psychometrics behind computerized adaptive testing. *Psychometrika*, 80 (1), 1-20.
30. Zheng, Y. & **Chang, H.-H.** (2015) On-the-fly assembled multistage adaptive testing, *Applied Psychological Measurement*, 39 (2), 105-118.
31. Guo, R., Zheng, Y., & **Chang, H-H.** (2015) A stepwise test characteristic curve method to detect item parameter drift. *Journal of Educational Measurement*, 52 (3), 280-300.
32. Meng, J., Tao, J., & **Chang, H-H.** (2015). A conditional joint modeling approach for locally dependent item responses and response times. *Journal of Educational Measurement*, 52 (1), pp.1-27.
33. Wang, C., Zheng, C., & **Chang, H-H.** (2014). An Enhanced Approach to Combine Item Response Theory with Cognitive Diagnosis in Adaptive Testing. *Journal of Educational Measurement*, 51 (4), 358-380.
34. Wang, C., Yi, Zheng, & **Chang, H-H.** (2014). Does standard deviation matter? Using standard deviation to quantify security of multistage testing. *Psychometrika*, 79 (1), 154-174.

35. Wang, C., **Chang, H-H.**, & Boughton, K. (2013). Deriving stopping rules for multidimensional computerized adaptive testing. *Applied Psychological Measurement*, 37 (2), 99-122.
36. Zheng, Y., Chang, C-H., & **Chang, H-H.** (2013). Content-balancing strategy in bifactor computerized adaptive patient-reported outcome measurement. *Quality of Life Research*, 22, 491-499.
37. Cheng, Y., Chen, P-H, Qian, J-H., & **Chang, H-H.** (2013). Equated pooled booklet method in DIF testing. *Applied Psychological Measurement*, 37(4), 276-288.
38. Wang, C., Fan, Z., **Chang, H-H.**, & Douglas, J. (2013). A semiparametric model for jointly analyzing response times and accuracy in computerized testing. *Journal of Educational and Behavioral Statistics*, 38 (4), 381-417.
39. Wang, C., **Chang, H.** & Douglas, J. (2013). The linear transformation model with frailties for the analysis of item response times. *British Journal of Mathematical and Statistical Psychology*, 66,144-168.
40. Liu, H., You, X., Wang, W., Ding, S. & **Chang, H-H.** (2013). The development of computerized adaptive testing with cognitive diagnosis for an English achievement test in China. *Journal of Classification*, 30, 152-172.
41. **Chang, H-H.** (2012). New editor's statement. *Applied Psychological Measurement*, 36 (8), 631.
42. Fan, Z., Wang, C., **Chang, H-H.** & Douglas, J. (2012). Utilizing response time distributions for item selection in computerized adaptive testing. *Journal of Educational and Behavioral Statistics*, 37 (5), 655-670.
43. Sun, S., Tao, J., **Chang, H-H.** & Shi, N. (2012). Weighted maximum-a-posterior estimation in tests composed of both dichotomous and polytomous items. *Applied Psychological Measurement*, 36 (4), 271-290.
44. Chen, P-H., **Chang, H-H.**, & Wu, H. (2012). Item selection for the development of parallel forms from an IRT-based seed test using a sampling and classification approach. *Educational and Psychological Measurement*, 72 (6) 933–953.
45. Chen, P., Xing, T., Wang, C., & **Chang, H-H.** (2012). On-line calibration methods for the DINA model with independent attributes in CA-CAT. *Psychometrika*, 77(2), 201-222.
46. Wang, C., **Chang, H-H.**, & Douglas, J. (2012). Combining CAT with cognitive diagnosis: a weighted item selection approach. *Behavior Research Methods*, 44, 95-109.
47. Cui, Y., Gierl, M., & **Chang, H-H.** (2012). Evaluating item selection algorithms in computerized adaptive testing for cognitive diagnosis: a simulation study. *Journal of Educational Measurement*, 49 (1), 19-38.
48. Tao, J., Shi, N., & **Chang, H-H.** (2012). Item-weighted likelihood method for ability estimation in tests composed of both dichotomous and polytomous Items. *Journal of Educational and Behavioral Statistics*, 37 (2), 298-315.
49. Zhang, J., **Chang, H-H.**, & Yi, Q. (2012). Comparing single-pool and multiple-pool designs regarding test security in computerized testing. *Behavior Research Methods*, 44,742-75.

50. Wang, C., **Chang, H-H.**, & Huebner, A. (2011). Restrictive stochastic item selection methods in cognitive diagnostic CAT. *Journal of Educational Measurement*, 48 (3), 255-273.
51. Wang, C. & **Chang, H-H.** (2011). Item selection in multidimensional computerized adaptive testing --- Gaining information different angles. *Psychometrika*, 76 (3), 363-384.
52. Wang, C., **Chang, H-H.**, & Boughton, K. (2011). Kullback-Leibler information and its applications in multidimensional adaptive testing. *Psychometrika*, 76(1), 13-39.
53. Deng, H., Ansley, T & **Chang, H-H.** (2010). An investigation of stratified and maximum information item selection procedures in CAT. *Journal of Educational Measurement*, 47, 202-226.
54. **Chang, H-H.**, & Ying, Z. (2009). Nonlinear sequential designs for logistic item response theory models with applications to computerized adaptive tests. *The Annals of Statistics*, Vol 37, No. 3, 1466-1488.
55. Cheng, Y., & **Chang, H-H.** (2009). The maximum priority index method for severely constrained item selection in computerized adaptive testing. *British Journal of Mathematical and Statistical Psychology*, 62, 369-383.
56. Cheng, Y., **Chang, H-H.**, Douglas, J., & Guo, F., (2009). Constraint-weighted a-stratification for computerized adaptive testing with non-psychometric constraints: balancing measurement efficiency and exposure control. *Educational and Psychological Measurement*, 69, 35-49.
57. Yi, Q., Zhang, J., & **Chang, H-H.** (2008). Severity of organized item theft in computerized adaptive testing: A Simulation study. *Applied Psychological Measurement*, 32 (7), 543-558.
58. **Chang, H-H.**, & Ying, Z. (2008). To weight or not to weight? Balancing influence of initial items in adaptive testing. *Psychometrika*, 73 (3), 441-450.
59. McGlohen, M. & **Chang, H-H.** (2008). Combining computer adaptive testing technology with cognitively diagnostic assessment. *Behavior Research Methods* 40 (3), 808-821.
60. Cheng, Y., **Chang, H-H.**, & Yi, Q., (2007). Two-phase item selection procedure for flexible content balancing in CAT. *Applied Psychological Measurement*, 31(6), 467-482.
61. Yi, Q., Zhang, J., & **Chang, H-H.** (2006). Assessing CAT test security severity. *Applied Psychological Measurement*, 30(1), 62-63.
62. Leung, C., **Chang, H-H.**, & Hau, K. (2005). Computerized adaptive testing: A mixture item selection approach for constrained situations. *British Journal of Mathematical and Statistical Psychology*, 58, 239-257.
63. **Chang, H-H.**, & Cheng, Y. (2005). The new developments and future research direction in computerized adaptive testing, part 2. *Testing Research (Chinese with English Abstract)*, 1(2), 24-43.
64. **Chang, H-H.**, & Cheng, Y. (2005). The new developments and future research direction in computerized adaptive testing, part 1. *Testing Research (Chinese with English Abstract)* 1(1), 12-24.

65. Yi, Q., & **Chang, H-H.** (2003). a-Stratified CAT design with content blocking. *British Journal of Mathematical and Statistical Psychology*, 56, 359-378.
66. van der Linden, W. J., & **Chang, H-H.** (2003). Implementing content constraints in Alpha-Stratified adaptive testing using a shadow test approach. *Applied Psychological Measurement*, 27(2), 107-120.
67. Leung, C., **Chang, H-H.**, & Hau, K. (2003). Computerized adaptive testing: A comparison of three content balancing methods. *The Journal of Technology, Learning, and Assessment*, 2(5), 2-15.
68. Leung, C., **Chang, H-H.**, & Hau, K. (2003). Incorporation of content balancing requirements in stratification designs for computerized adaptive testing. *Educational and Psychological Measurement*, 63(2), 257-270.
69. **Chang, H-H.**, & van der Linden, W. J. (2003). Optimal stratification of item pools in a-stratified computerized adaptive testing. *Applied Psychological Measurement*, 27(4), 262-274.
70. Pastor, D., Dodd, B., & **Chang, H-H.** (2002). A comparison of item selection techniques and exposure control mechanisms in CATs using the generalized partial credit model. *Applied Psychological Measurement*, 26(2), 147-163.
71. Leung, C., **Chang, H-H.**, & Hau, K. (2002). Item selection in computerized adaptive testing: Improving the a-stratified design with Sympton-Hetter algorithm. *Applied Psychological Measurement*, 26(4), 376-392.
72. **Chang, H-H.**, & Zhang, J. (2002). Hypergeometric family and item overlap rates in computerized adaptive testing. *Psychometrika*, 67(3), 387-398.
73. **Chang, H-H.** (2002). Some issues in the designs of item selection algorithm for computerized adaptive testing. *Testing Research (Chinese with English Abstract)*, 2, 35-39.
74. Leung, C., **Chang, H-H.**, & Hau, K. (2001, March). Making a-stratified computerized adaptive testing design more practical: Imposing non-statistical constraints. *Global Chinese Journal on Computers in Education*, 1(1). Retrieved March 28, 2008 from <http://www.fed.cuhk.edu.hk/GCJCE/gcice04/gcice04.html>
75. Hau, K., & **Chang, H-H.** (2001). Item selection in computerized adaptive testing: Should more discriminating items be used first? *Journal of Educational Measurement*, 38(3), 249-266.
76. **Chang, H-H.**, Qian, J., & Ying, Z. (2001). a-Stratified multistage Computerized Adaptive Testing with b blocking. *Applied Psychological Measurement*, 25(4), 333-341.
77. Bickel, P., Buyske, S., **Chang, H-H.**, & Ying, Z. (2001). On maximizing item information and matching difficulty with ability. *Psychometrika*, 66(1), 69-77.
78. Mislevy, R., & **Chang, H-H.** (2000). Does adaptive testing violate local independence? *Psychometrika*, 65(2), 149-156.
79. **Chang, H-H.**, & Ying, Z. (1999). a-Stratified multistage computerized adaptive testing. *Applied Psychological Measurement*, 23(3), 211-222.

80. Chen, S., Ankenmann, R., & **Chang, H-H.** (2000). A comparison of item selection rules at the early stages of computerized adaptive testing. *Applied Psychological Measurement*, 24(3), 241-255.
81. **Chang, H-H.**, & Ying, Z. (1996). A global information approach to computerized adaptive testing. *Applied Psychological Measurement*, 20(3), 213-229.
82. **Chang, H-H.**, Mazzeo, J., & Roussos, L. (1996). Detecting DIF for polytomously scored items: An adaptation of the SIBTEST procedure. *Journal of Educational Measurement*, 33(3), 333-353.
83. **Chang, H-H.** (1996). The asymptotic posterior normality of the latent trait for polytomous IRT models. *Psychometrika*, 61(3), 445-453.
84. **Chang, H-H.**, & Mazzeo, J. (1994). The unique correspondence of item response function and item category response functions in polytomously scored item response models. *Psychometrika*, 59(3), 391-404.
85. **Chang, H-H.**, & Stout, W. (1993). The asymptotic posterior normality of the latent trait in an IRT model. *Psychometrika*, 58(1), 37-52.
86. Stout, W., Nandakumar, R., Junker, B., **Chang, H-H.**, & Steidinger, D. (1992). DIMTEST: A FORTRAN program for assessing dimensionality of binary item responses. *Applied Psychological Measurement*, 16, 236.

BOOK

Cheng, Y. & **Chang, H-H.** (2014). (Ed.) *Advanced methodologies to support both summative and formative assessments*, Information Age Publisher Inc., Charlotte, NC.

BOOK CHAPTER & BOOK REVIEW (PEER REVIEWED)

Published After August 2018

1. Du, Y., A. Li, & **Chang, H-H.** (2019). Utilizing response time in on-the-fly multistage adaptive testing. In Wiberg, M., Culpepper, S., Janssen, R., González, J., & Molenaar, D. (Ed.), *Quantitative Psychology*, Springer.
2. Wang, C. & **Chang, H-H.** (2018). Cognitive diagnostic assessment. In van der Linden, W. J. (Ed.), *Handbook of item response theory, Volume Three, Statistical Tools* (pp. 329-348). CRC Press, Taylor & Francis Group, FL.

Published Before 2018

3. Chang, H-H., Wang, C., & Ying, Z. (2016). Information theory and its application to testing. In van der Linden, W. J. (Ed.), *Handbook of item response theory, Volume Two, Statistical Tools* (pp. 105-123). CRC Press, Taylor & Francis Group, FL.
4. Zheng, Y., Wang, C., Culbertson, M. J., & Chang, H-H. (2014). Test assembly in computerized multistage testing. In D. Yan, A. A. von Davier, & C. Lewis (Eds.), *Computerized multistage testing: Theory and applications* (pp. 87-99), CRC Press., New York, NY.

5. Zheng, Y. & Chang, H-H. (2014). Multistage testing, on-the-fly multistage testing, and beyond. In Y. Cheng & H-H. Chang (Eds.), *Advanced methodologies to support both summative and formative assessments* (pp.21-39), Information Age Publisher Inc., Charlotte, NC.
6. Tao, J. & Chang, H-H. (2014). Weighted estimation methods for mixed-type tests. In Y. Cheng & H-H. Chang (Eds.), *Advanced methodologies to support both summative and formative assessments* (pp.107-119), Information Age Publisher Inc., Charlotte, NC.
7. Liu, H., You, X., Wang, W., Ding, S, & Chang, H-H. (2014). Large-scale implementation of computerized adaptive testing with cognitive diagnosis in China. In Y. Cheng & H-H. Chang (Eds.), *Advanced methodologies to support both summative and formative assessments* (pp.245-261), Information Age Publisher Inc., Charlotte, NC.
8. Chang, H-H. (2012). Making computerized adaptive testing diagnostic tools for schools. In R. W. Lissitz & H. Jiao (Ed.), *Computers and their impact on state assessments: Recent history and predictions for the future* (pp. 195-226), Information Age Publisher Inc., Charlotte, NC.
9. Chang, H-H. & Wang, C. (2011). Book review: Mark Reckase's multidimensional item response theory. *Psychometrika*, 76(3), 504-506.
10. Chang, H-H. (2008). Psychometrics. In Darity, W. (Ed.) *International Encyclopedia of The Social Sciences*, 2nd Edition 9 Vols. (6 vol, pp. 587-590). Macmillan Reference USA, Detroit, MI.
11. Chang, H-H. & Ying, Z. (2007). Computerized Adaptive testing. In Salkind, N. (Ed.) *The Sage Encyclopedia of Measurement and Statistics* (pp. 170-174). Sage Publications, Thousand Oaks, CA.
12. Chang, H-H. (2007). Book review: Wim J. van der Linden's linear models for optimal test design. *Psychometrika*, 72, 279-281.
13. Chang, H-H. (2004). Understanding Computerized Adaptive Testing – From Rabins-Moron to Lord, and beyond. In Kaplan, D. (Ed.) *The sage handbook of quantitative methods for the social sciences* (pp. 117-133), Sage Publications, Thousand Oaks, CA.

TECHNICAL REPORTS

1. Ali, U. & Chang, H-H. (2014). An item-driven adaptive design for calibrating pretest items. *ETS Research Report Series 2014* (2), 1-12, Princeton, NJ.
2. Chang, H., Ryan, K., Zheng, Y., Ali, U., & Wang, C. (Jan 2011). Scale stability: an empirical study on ISAT (Report No. 10 to the Illinois State Board of Education). University of Illinois, Champaign, IL.
3. Chang, H., Ryan, K., Ali, U., Lim, E., & Wang, C. (June 2010). The impact of different samples in IL state assessment under 3PL-GPC models (Report No. 7 to the Illinois State Board of Education). University of Illinois, Champaign, IL.
4. Chang, H., Ryan, K., Ali, U., Lin, H. & Wang, C. (June 2009). The 2008 equating under 3PL-GPC models: replication (Report No.2 to the Illinois State Board of Education). University of Illinois, Champaign, IL.

5. Chang, H., Ryan, K., Ali, U., Lin, H. & Wang, C. (June 2008). The 2008 equating under the Rasch models: replication (Report No.1 to the Illinois State Board of Education). University of Illinois at Champaign, IL.
6. Yi, Q., Zhang, J., & Chang, H. (2006). Severity of organized item theft in computerized adaptive testing: An empirical study (ETS Research Rep. RR-06-22). Princeton, NJ: Educational Testing Service.
7. Zhang, J., & Chang, H. (2005). The effectiveness of enhancing test security by using multiple item pools (ETS Research Rep. RR-05-19). Princeton, NJ: Educational Testing Service.
8. van der Linden, W. J., & Chang, H. (2005). Implementing content constraints in alpha-stratified adaptive testing using a shadow test approach (LSAC Computerized Testing Report 01-09). Newtown, PA: Law School Admission Council.
9. Qian, J., Chang, H., Kaplan, B., Liang, J-L., & Lim, Y-H. (2001). Data analysis of the state writing assessment. In N. Allen (Ed.), *The NAEP 1998 Tech. Rep.* 381-398. Washington, DC: National Center for Education Statistics.
10. Jenkins, F., Qian, J., Chang, H., & Kaplan, B. (2001). Introduction to the data analysis for the national and state writing samples. In N. Allen (Ed.), *The NAEP 1998 Tech. Rep.* 359-370. Washington, DC: National Center for Education Statistics.
11. Mislevy, R., & Chang, H. (1998). Does adaptive testing violate local independence? (Research Rep. 98-33). Princeton, NJ: Educational Testing Service.
12. Chang, H., & Jenkins, F. (1998). Data analysis and scaling for the 1996 assessment in mathematics (NAEP 1996 Tech. Rep.). Washington, DC: National Center for Education Statistics.
13. Chang, H. (1996). Data analysis for the 1994 long-term trend reading. In E. Johnson & J. Carlson (Eds.), *The NAEP 1994 technical report*. Washington, DC: National Center for Education Statistics.
14. Allen, N., Chang, H., & Swinton, S. (1996). Data analysis and scaling for the 1994 Puerto Rico mathematics and science (1994 Puerto Rico educational assessment Tech. Rep.). Washington, DC: National Center for Education Statistics.
15. Chang, H., Mazzeo J., & Roussos, L. (1995). Detect DIF for polytomously scored items: An adaptation of Shealy-Stouts' SIBTEST procedure (ETS Research Rep. 95-5). Princeton, NJ: Educational Testing Service.
16. Mazzeo, J., Chang, H., Kulick, E., Fong, Y. F., & Grima, A. (1993). Data analysis and scaling for the 1992 trial state assessment in mathematics. In E. Johnson, J. Mazzeo, & D. Kline (Eds.), *Technical report of the NAEP 1992 trial state assessment program in mathematics*. Washington, DC: National Center for Education Statistics.
17. Chang, H., & Mazzeo, J. (1993). The unique correspondence of item response function and item category response functions in polytomously scored item response models (ETS Research Rep. 93-53). Princeton, NJ: Educational Testing Service.

18. Chang, H., & Stout, W. F. (1991). The asymptotic posterior normality of the latent trait in an IRT model (ONR Research Rep. 91-4). Urbana: University of Illinois, Department of Statistics.

PRESENTATIONS

Keynote and Invited Presentations After August 2018

1. **Chang, H-H.** (April 2022). *AI, individualized assessment, and diversity & inclusion in our educational system.* Career-Award Keynote Presentation at the Annual Meeting of National Council on Measurement in Education, San Diego, CA.
2. **Chang, H-H.** (January 2022). *The future of psychometric research: From standardized testing to learning analytics.* Invited by the Quantitative Methods Program, Department of Psychology & Human Development at Vanderbilt University.
3. **Chang, H-H.** (December 2021). *An on-the-fly MSAT design for PISA to increase estimation efficiency and get more diagnostic information.* Invited Presentation at the Virtual Workshop: Adaptive testing in PISA: Past, Present and Future, Programme for International Student Assessment (PISA), OECD. Paris France.
4. **Chang, H-H.** (November 2021). *Important psychometric research during the COVID-19 pandemic.* Keynote Speech at the Annual Meeting of the Chinese Testing Society, Taipei, Taiwan. (Online).
5. **Chang, H-H.** (March 2021). *The future of psychometric research: Standardized testing in education,* invited by the Department of Educational Psychology, the University of Illinois at Urbana-Champaign, Urbana, IL. (Online.)
6. **Chang, H-H.** (December 2020). *My best wishes to the establishment of the institute of smart education.* Keynote at East China Normal University, Shanghai, China. (Online.)
7. **Chang, H-H.** (November 2020). *Urgent CD-CAT research during the COVID-19 pandemic.* Keynote Address, Research Forum on Opportunities and Challenges in Assessment in the Digital Era, Hong Kong, China. (Online.)
8. **Chang, H-H.** (July 2020). *Using CD-CAT to support large gateway course instructions whether in-class or online.* Invited Presentation at Faculty of Education, East China Normal University, Shanghai China. (Online.)
9. **Chang, H-H.** (December 2019). *An effective design of educational assessment at the national level in the Big Data era.* Keynote presentation at the 5th Annual Conference on Quality Monitoring and Evaluation of Basic Education in China, Chang Chun, China.
10. **Chang, H-H.** (December 2019). *Using adaptive learning to help rural education.* Invited presentation at the Institute of Rural Education, Northeast Normal University, Chang Chun, China.
11. **Chang, H-H.** (December 2019). *Adaptive testing, from Robbins-Monro to F. Lord and beyond.* Invited Presentation at the School of Mathematical and Statistical Sciences, Northeast Normal University, Chang Chun, China.

12. **Chang, H-H.** (December 2019). *From artificial intelligence to adaptive testing and beyond*. Keynote Presentation at the 2019 Annual Meeting of the Chinese Testing Society, Taipei, Taiwan.
13. **Chang, H-H.** (December 2019). *Education measurement and my academic path*. Invited presentation at The National Normal University of Taiwan, Taipei, Taiwan.
14. **Chang, H-H.** (December 2019). *Improve learning and teaching by AI powered assessment tools*. Invited Presentation at Beijing Normal University at Zhuhai Campus, Zhuhai, China.
15. **Chang, H-H.** (October 2019). *Computerized adaptive testing, AI and personalized learning*. Invited presentation at American Institute of Research, Crystal City, Virginia.
16. **Chang, H-H.** (September 2019). *From data driven smart testing to smart learning*. Keynote Speech at Power Friday Presentation Series, College of Education at Purdue University.
17. **Chang, H-H.** (May 2019). *From artificial intelligence to adaptive testing and individualized learning*. Invited presentation, Department of Statistics, National University of Colombia, Bogota, Colombia.
18. **Chang, H-H.** (May 2019). *From adaptive testing to adaptive learning*. Fulbright Keynote Presentation, University of Andes, Bogota, Colombia.
19. **Chang, H-H.** (March 2019). *From artificial intelligence to adaptive testing and individualized learning*. Invited Presentation at College of Education, University of Washington, Seattle, Washington.
20. **Chang, H-H.** (February 2019). *From smart testing to smart learning*. Invited Presentation, College of Education, University of Iowa, Iowa City, IA.
21. **Chang, H-H.** (February 2019). *Diversity and inclusion in psychometric research*. Invited Presentation, Educational Psychology & Learning Sciences, University of Iowa, Iowa City, IA.
22. **Chang, H-H.** (September 2018). *From adaptive testing to adaptive learning*. Keynote speech at the biennial Conference of Frontiers in Educational measurement, September 12-13, 2018, Oslo Norway.

INVITED PRESENTATIONS (1992-2017)

1. International Educational Statistics and Measurement Symposium (invited speaker), Tainan Teachers College, Tainan, Taiwan, April 1991.
2. Educational Testing Service, Princeton, NJ, August 1991.
3. College of Educational Sciences, East China Normal University (3-day lecture series), Shanghai, China, December 1993.
4. The Eleventh Item Response Theory Workshop (Keynote speaker), the University of Twente, Enschede, The Netherlands, November 1995.
5. Law School Admission Council, Newtown, Pennsylvania, November 1995.
6. *Prime time radio calling show guest*, the Voice of America, US Information Agency, Washington, D.C., March 8, 1996.

7. Department of Statistics, University of Illinois at Urbana-Champaign, Champaign, IL, November 8, 1996.
8. Department of Psychology, Beijing Normal University, Beijing, China, Aug. 1997.
9. The 7-th Annual Meeting of Educational Statistics and Measurement of China (Keynote speaker), Ganzhou, Jiangxi, China, Oct. 1997.
10. Examination Authority of Hong Kong, Hong Kong, Nov. 7, Dec. 4, 1997 and Feb. 5 1998.
11. Graduate School of Education, University of California, Berkeley, CA, April 1998.
12. Department of Educational Psychology, Jiangxi Normal University, Nanchan, China, Jan. 1998.
13. Department of Educational Psychology, Nanjin Normal University, Nanjin, China, Jan. 1998.
14. Department of Educational Psychology, University of Wisconsin, Madison, Wisconsin, February 1998.
15. Department of Psychology, Beijing Normal University, Beijing, China, May 11-18, 1998.
16. Department of Psychology, East China Normal University, Shanghai, China, May 1998.
17. Examination Authority of Hong Kong, Hong Kong, June 1998.
18. Hong Kong Department of Education, Hong Kong, June 1998.
19. Law School Admission Council, Newtown, Pennsylvania, October 1998.
20. Law School Admission Council, Newtown, Pennsylvania, Feb. 1999.
21. National Board of Medical Examiners, Philadelphia, PA, Jan. 8, 1999.
22. Department of Measurement, Statistics and Evaluation, University of Maryland, College Park, MD, March 11, 1999.
23. School of Education, University of Michigan, Ann Arbor, MI, March 15, 1999.
24. Department of Psychology, University of Michigan, Ann Arbor, MI, March 16, 1999.
25. Department of Educational Psychology, University of Minnesota, Twincity, MN, March 30, 1999.
26. College of Education, Jianxi Normal University, Nanchan, China, March 21, 2000.
27. Ministry of Health, P.R. China, Beijing, China, March 17, 2000.
28. College of Education, Jianxi Normal University, Nanchan, China, December 2001.
29. Tianjin Educational Examinations Authority, Tianjin, China, December 2001.
30. Department of Statistics, University of Illinois, Urbana-Champaign, IL, April 2002.
31. Shanghai Municipal Educational Examinations Authority, Shanghai, China, December 2002.
32. Tianjin Educational Examinations Authority, Tianjin, China, December 2002.
33. Educational Examinations Authority of P.R China, Beijing, China, December 2002.
34. Examination Center of Ministry of HR, P.R. China, Beijing, China, December 2002.
35. Department of Information and Educational Technology, East China Normal University, December 2002.
36. Department of Statistics, East China Normal University, Shanghai, China, December 2002.
37. Department of Psychology, Beijing Normal University, Beijing, China, December 2002.

38. Department of Psychology, Peking University, Beijing, China, December 2002.
39. School of Basic Medical Sciences, The 2nd Military Medical University, Shanghai, China, December 2002.
40. Educational Testing Service, Princeton, NJ, July 28, 2003.
41. Baylor College of Medicine, Houston, TX, November 13, 2003.
42. Harcourt Educational Measurement, San Antonio, TX, August 2004.
43. Invited Symposium, the 28th International Congress of Psychology, Beijing, China, August 8-13, 2004.
44. School of Education, University of Michigan, Ann Arbor, MI, January 2005.
45. Departments of Educational Psychology and Psychology, University of Illinois, Urbana-Champaign, IL, February 2005.
46. Department of Applied psychology, New York University, New York, NY, February 2005.
47. Survey Research Center, University of Michigan, Ann Arbor, MI, March 17, 2005.
48. Department of Statistics, University of Michigan, Ann Arbor, MI, March 18, 2005.
49. National Medical Examination Center, Beijing, China, November 2005.
50. Testing Center of Labor Ministry, Beijing, China, November 2005.
51. School of Psychological Sciences, Beijing Normal University, Beijing, China, November 2005.
52. "New developments in large scale educational assessment", Beijing Municipal Educational Examination Authority, Beijing, China, November 2005.
53. Shanghai Municipal Educational Examination Authority, Shanghai, China, November 2005.
54. Beijing Language and Culture University, Beijing, China, November 2005.
55. Department of Psychology, Shanghai Normal University, Shanghai, China, December 14, 2006.
56. College of Education, Jianxi Normal University, Nanchan, China, December 17, 2006.
57. Department of Psychology, Peking University, Beijing, China, December 7, 2006.
58. Public Presenter, American College Testing, Iowa City, Iowa, October 26, 2006.
59. Beijing Language and Cultural University, Beijing, China, July 2007.
60. Keynote speech at the National Conference on Test Security in Medical Licensure Examinations, Urumqi, China, August 10-13, 2007.
61. The 72nd Annual Meeting of the Psychometric Society, July 9-13, 2007, Tokyo, Japan.
62. The 2007 Pacific Rim Objective Measurement Symposium, Taipei, Taiwan, July 17-19, 2007.
63. Keynote speech at the National Conference of Curriculum Reform, Shanghai, China, April 2008.
64. School of Psychology, Beijing Normal University, Beijing, China, December 22, 2008.
65. Department of Psychology, University of Notre Dame, South Bend, IN, March 27, 2009.
66. The 25th Item Response Theory Workshop (Invited speaker), the University of Twente, Enschede, The Netherlands, November 2009.

67. Keynote speech at the International Forum on Curriculum Evaluation Reform, East China Normal University, Shanghai, China, November 2009.
68. Department of Statistics, Purdue University, West Lafayette, IN, February 11, 2010.
69. Department of Measurement, Statistics, and Evaluation, University of Maryland, College Park, MD, Feb. 24, 2010.
70. Defense Manpower Data Center, Monterey Bay, CA, March 2010.
71. The Tenth Annual Maryland Assessment Conference: Computers and Their Impact On State Assessment: Recent History And Predictions For The Future, University of Maryland at College Park, MD, October 2010.
72. National Medical Examination Center, Ministry of Health, Beijing, China, November 2010.
73. Department of Educational Technology, East China Normal University, Shanghai, China, October 2010.
74. School of Psychology, Jiangxi Normal University, Nanchang, China, October 2010.
75. Expert Group Meeting on Media and Information Literacy Indicators, United Nations Education, Scientific, and Cultural Organization, Bangkok, Thailand, November 2010.
76. Center of National Assessment of Educational Quality, Beijing Normal University, Beijing, China, November 2010.
77. Foreign Language Teaching and Research Press, Beijing, China, November 2010.
78. Institute of Web-based Learning, East China Normal University, Shanghai, China, November 2010.
79. Department of Educational Psychology, University of Wisconsin at Milwaukee, Milwaukee, MI, November 2010.
80. Keynote Speaker, Media and Information Literacy Indicators and Government Action Recommendation, IFLA Off-Site Session, IFLA Information Literacy Section/UNESCO, Universidad Politécnica de Puerto Rico, Avenida Juan Ponce de León 377, Hato Rey, Puerto Rico, August 11, 2011.
81. Keynote Speaker, The 2011 International Association of Computerized Adaptive Testing Conference, Pacific Grove, CA, October 3-5, 2011.
82. Keynote Speaker, The Annual Meeting of Assessment and Evaluation, the Chinese Society of Education, May 20-22, 2013, Dalian, China.
83. Keynote Speaker, The AERA Division-D Luncheon and Business Meeting, The Annual Meeting of American Educational Research Association, Vancouver, Canada, April 2012.
84. Fu-Nian Lecture Speaker, East China Normal University, March 22, 2013, Shanghai, China.
85. Keynote Speaker, The Annual Meeting of Assessment and Evaluation, the Chinese Society of Education, May 20-22, 2013, Dalian, China, May.
86. Presidential Address, The 78th Annual Meeting of the Psychometric Society, June 25, 2013, Arnhem, the Netherlands.
87. Keynote Speaker, The 2013 Meeting of Taiwan Education Research Association and Pacific Rim Objective Measurement Society, August 4, 2013, Kaohsiung, Taiwan.

88. Department Lecture, Department of Psychology, University of Minnesota, October 25, 2013, Twin City, MN.
89. Invited Speaker, The 8th Global Conference of Confucius Institute, December 7-8, 2013, Beijing, China.
90. Invited Department Lecture, Department of Education Information Technology, East China Normal University, December 16, 2013, Shanghai, China.
91. Keynote Speaker, The 2nd Workshop on Probabilistic and Statistical Methods, February 5-7, 2014, Sao Carlos, SP, Brazil.
92. Keynote Speaker, The 3rd Workshop on Statistical Methods in Cognitive Assessment, May 27-31, Shanghai, China.
93. Commencement Speaker, College of Educational Sciences, East China Normal University, June 16, 2014, Shanghai, China.
94. Invited Speaker, The Headquarters of Confucius Institute, June 17, 2014, Beijing, China.
95. Keynote Speaker, the 11th Cross-Straits Conference on Educational and Psychological Testing, August 22-24, Taichung, Taiwan.
96. Keynote Speaker, 2014 Robert Bohrer Memorial Workshop in Statistics, Department of Statistics, UIUC, November 13, 2014.
97. Invited Speaker, Department of Statistics, Northwestern University, Evanston, IL, April 7, 2015
98. Keynote Speaker, Vision Latino America Version XI, May 6-9, Barranquilla, Colombia.
99. Keynote Speaker, the 1st Forum on Big Data and K-12 Education, July 7, 2015, Wu Xi, China.
100. Invited Workshop on Psychometrics in the era of Big Data, Beijing Normal University, July 8-10, Beijing, China.
101. Keynote Speaker, 2015 Annual Meeting of International Association of Computerized Adaptive Testing, Queens College, University of Cambridge, September 14-16, 2015, UK.
102. Keynote Speaker, the 15th Forum on Chinese Educational Informatics and Development, October 25, 2015, Hong Zhou, China.
103. Keynote Speaker, the 1st Chinese Language Testing Forum, Beijing Language University, December 5-6, 2015, Beijing China.
104. Invited Speaker, Directors' Forum at the 10th Global Confucius Institute Conference, December 6-8, 2015, Shanghai, China.
105. Invited Speaker at Yao-Hu Forum, Jiangxi Normal University, December 10, 2015, Nan Chang, China.
106. Keynote Speaker, 2015 Global Chinese Conference on Educational Information and Assessment, December 19-20, Taichung, Taiwan.
107. Xing-Guan Forum Speaker, School of Educational Information and Technology, Central China Normal University, December 24, 2015, Wu Han, China.
108. Keynote Speaker, The 1st Annual Meeting of Chinese Educational Progress Assessment and Evaluation, December 26-27, 2015, Beijing, China.

109. Invited Speaker, The 6th American Midwest Confucius Institute Director Conference, September 3-4, 2016, Colorado State University, Fort Collins, CO.
110. Invited Speaker, The Fourth Conference on the Statistical Methods in Psychometrics, August 30 to September 1, 2016, Columbia University, Now York, NY.
111. Keynote Speaker, The 2st Annual Meeting of Chinese Educational Progress Assessment and Evaluation, December 26-27, 2016, Beijing, China.
112. Invited Speaker, The 3rd National Chinese Language Conference, April 7-9, 2017, Houston, TX.
113. Invited Speaker, July 7, 2017, American College Testing Inc., Iowa City, IA.
114. Invited Speaker, September 22, 2017, Department of Statistics, University of Michigan, Ann Arbor, MI.
115. Keynote Speaker, The 2018 Symposium of Smart Testing and Learning, June 23-24, 2018, Nanchang, China.
116. Invited Speaker, Workshop on Statistics and Measurement, June 27-28, 2018, Guizhou Normal University, Guiyang, China.
117. The 2018 AERA E.F. Lindquist Lecture, New York, NY.
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Conference Presentations (August 2018 - Current)

1. **Chang, H-H.** (July 2021). *The future of psychometric research: From standardized testing to learning analytics*. Online presentation at the International Meeting of the Psychometric Society.
2. Wu, T. & **Chang, H-H.** (July 2021). Modeling students' response time in an attribute balanced cognitive diagnostic adaptive testing. Online presentation at the International Meeting of the Psychometric Society. (With Student.)
3. Tang, X., Wu, T., & **Chang, H-H.** (July 2021). *Comparison of on-the-fly MST with preassembled MST on PISA data*. Online presentation at the International Meeting of the Psychometric Society. (With Students.)
4. Chang, H-H. (June 2021). *From CAT to smart learning – urgent research during the pandemic*, Symposium Organized and Led by Chang, the Annual Meeting of National Council on Measurement in Education. (Online.)
5. Zhu, Z. & **Chang, H-H.** (June 2021). *A machine learning method for classify student's learning status*, online presentation at the Annual Meeting of National Council on Measurement in Education.
6. Wu, T. & **Chang, H-H.** (June 2021). A time constrained CAT design to support online testing, online presentation at the Annual Meeting of National Council on Measurement in Education. (With Student.)
7. Wu, X., Tang, X. & **Chang, H-H.** (June 2021). *Using cognitive diagnostic analysis to construct learning path of data-analysis-knowledge for pre-service teachers*, online presentation at the Annual Meeting of National Council on Measurement in Education. (With Student.)

8. **Chang, H-H.** (June 2019). *From adaptive testing to artificial intelligence and smart learning*. Symposium organized at the 2019 Conference of International Association of Computerized Adaptive Testing. Minneapolis, MN.
9. Tian, C. & **Chang, H-H.** (April 2019). *Design and comparison of four stopping rules in mastery computerized adaptive testing and on-the-fly*. Paper presented at the Annual Meeting of National Council on Measurement in Education, Toronto, Canada. (With Students.)
10. Li, X., Xu, H., Zhang, J., & **Chang, H-H.** (April 2019). *Optimal learning strategy with reinforcement learning*. Paper presented at the Annual Meeting of National Council on Measurement in Education, Toronto, Canada. (With Students.)
11. Du, Y., Li, A., & **Chang, H-H.** (April 2019). *Utilizing interval estimation and response time in on-the-fly multistage testing*. Paper presented at the Annual Meeting of National Council on Measurement in Education, Toronto, Canada. (With Students.)
12. **Chang, H-H.** (January 2019). *Using computerized adaptive testing to help a large introductory STEM university course teaching*. Paper presented at the Indiana STEM Education Conference, West Lafayette, IN.
13. **Chang, H-H.** (January 2019). *Making computerized adaptive testing a diagnostic tool for schools*. Paper presented at the Indiana STEM Education Conference, West Lafayette, IN.

Conference Presentations

From 1990 to 2001

- 12 paper presentations at the annual meetings of the Psychometric Society from 1993 to 2001.
- 17 paper presentations at the annual meetings of American Educational Research Association from 1991 to 2001.
- 16 paper presentations at the annual meetings of National Council on Measurement in Education from 1991 to 2001.
- 3 paper presentations at the Joint Statistical Meetings from 1997 to 2001
- 1 paper presentation at the Third International Chinese Statistical Conference in 1996
- 1 paper presentation at 1998 Chinese International Conference of Computer in Education
- 4 presentations at ETS' Joint Statistics and Psychometrics Seminars from 1993 to 1999
- 2 presentations at 1990 and 1991 ONR Contractor's Meetings on Model-Based Measurement.

Conference Presentations (2002-2018)

57. Chang, H. (April 2002). CAT—Item Exposure Control and Ability Estimation. Paper presented at the annual meeting of the American Educational Association, New Orleans, LA.
58. Chang, H., & Ying, Z. (April 2002). To weight or not to weight? Balancing influence of initial and later items in CAT. Paper presented at the annual meeting of the National Council on Measurement in Education, New Orleans, LA.

59. Chang, H., & Zhang, J. (April 2002). Identify the Lower Bounds for Item Sharing and Item Pooling in Computerized Adaptive Testing. Paper presented at the annual meeting of the National Council on Measurement in Education, New Orleans, LA.
60. Leung, C. K., Hau, T. K., & Chang, H. (April 2002). Comparing three item selection approaches for computerized adaptive testing with content balancing requirement. Paper presented at the annual meeting of the National Council on Measurement in Education, New Orleans, LA.
61. Chang, H., & Ying, Z. (April 2003). Test-Score Compatibility, Ability Estimation, and Item-Exposure Rate Control in Computerized Adaptive Testing. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago.
62. Chang, H., & Zhang, J. (April 2003). Assessing CAT Security Breaches by the Item Pooling Index --- to compromise a CAT item bank, how many thieves are needed? Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago.
63. Leung, C. K., Hau, T. K., & Chang, H. (April 2003). Computerized Adaptive Testing: A Comparison of Three Content Balancing Methods. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago.
64. Xu, X., Chang, H., & Douglas, J. (April 2003). A simulation study to compare CAT strategies for cognitive diagnoses. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago.
65. Chang, H., Qian, J., Chen, P., & Cheng, Y. (2004, June). Adjustment of BIB data for DIF Testing. Paper presented at the International meeting of the Psychometric Society, Pacific Grove, CA.
66. Cheng, Y., Chang, H., & Yi, Q. (2004, June). Two-phase item selection with realistic content balancing constraints in computerized adaptive testing. Paper presented at the 2004 International Meeting of the Psychometric Society, June 14-17, 2004, Pacific Grove, CA.
67. McGlohen, M., Chang, H., & Miller, E. (April 2004). Joining Diagnostic Assessment with Large-Scale Standardized Testing, paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.
68. McGlohen, M., Chang, H., & Wills, J. (April 2004). Combining computer adaptive testing technology with cognitively diagnostic assessment, paper presented at the annual meeting of the National Council on Measurement in Education, San Diego, CA.
69. Chang, H., & Zhang, J. (2005, April). Rescuing CAT by fixing the problems. Paper presented at the annual meeting of the National Council on Measurement in Education, Montreal, Canada.

70. Chen, P-H., & Chang, H. (April 2005) Automated test assembly for multiple test forms by two item pool stratification models. Paper presented at the annual meeting of the National Council on Measurement in Education, April 11-14, 2005, Montreal, Canada.
71. Chen, P-H., & Chang, H. (April 2005). Balanced incomplete block data adjustment for NAEP DIF testing. Paper presented at the annual meeting of the American Educational Research Association, April 11-15, 2005, Montreal, Canada.
72. Cheng, Y., & Chang, H. (April 2005). Customized a-stratification in CAT: How many strata to use? Paper presented at the annual meeting of the National Council on Measurement in Education, Montreal, Canada.
73. Cheng, Y., & Chang, H. (April 2005). Two-phase item selection procedure for flexible content balancing in CAT. Paper presented at the annual meeting of the American Educational Research Association, Montreal, Canada.
74. Kim, S., & Chang, H. (April 2005). Automated test assembly for cognitive diagnostic tests. Paper presented at the annual meeting of the American Educational Research Association, Montreal, Canada.
75. Yi, Q, Zhang, J., & Chang, H. (April 2005). Identifying Practical Indices for Enhancing Item Pool Security. Paper presented at the annual meeting of the National Council on Measurement in Education, Montreal, Canada.
76. Ying, Z., & Chang, H. (April 2005). Modeling response latencies for computerized adaptive tests. Paper presented at the annual meeting of the National Council on Measurement in Education, Montreal, Canada.
77. Zhang, J., & Chang, H. (April 2005). The effectiveness of using multiple item pools or linear form tests in enhancing test security. Paper presented at the annual meeting of the National Council on Measurement in Education, Montreal, Canada.
78. Chang, H. (April 2006). K4 – Issues in Reliability. Paper discussed at the annual meeting of the National Council on Measurement in Education, San Francisco.
79. Chang, H., & Ying, Z. (August 2006). Making item selection more efficient in computerized adaptive testing. Paper presented at the Joint Statistical Meeting, Seattle, WA
80. Chen, P., & Chang, H. (April 2006). A statistical perspective of IRT-based automated test assembly: the cell and cube methods. Paper presented at the annual meeting of the American Educational Research Association, San Francisco.
81. Cheng, Y., Chang, H., & Wang, X. (April 2006). Constraints-weighted information method for item selection of severely constrained computerized adaptive testing. Paper presented at the Annual Meeting of the National Council on Measurement in Education, San Francisco.

82. Lin, H., Din., S., & Chang, H. (April 2006). Computerized adaptive testing for cognitive diagnosis. Paper presented at the annual meeting of the National Council on Measurement in Education, San Francisco.
83. Yi, Q., Zhang, J., & Chang, H. (April 2006). An empirical study on effectiveness of using item pools in CAT. Paper presented at the annual meeting of the National Council on Measurement in Education, San Francisco.
84. Chang, H. (April 2007). K5 – Ability and Parameter Estimation. Paper discussed at the annual meeting of the National Council on Measurement in Education, Chicago.
85. Chang, H. (April 2007). Should we use “recycled” items in cat? Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago.
86. Cheng, Y., & Chang, H (April 2007). Dual information method in cognitive diagnostic computerized adaptive testing. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago.
87. Cheng, Y., & Chang, H. (July 2007). The “selection and allocation” method for automated test assembly. Paper presented at the annual meeting of the Psychometric Society, Tokyo.
88. Cheng, Y., & Chang, H. (April 2007). Two item selection methods in computerized adaptive testing for cognitive diagnosis. Paper presented at the annual meeting of the American Educational Research Association, Chicago.
89. Yi, Q., Zhang, J., & Chang, H. (April 2007). The effects of item pool size on the severity of possible test security violation in CAT. Paper presented at the annual meeting of the American Educational Research Association, Chicago.
90. Yi, Q., Zhang, J., & Chang, H. (April 2007). Improving cat test security by using an adjusted-pool approach. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago.
91. Zhang, J., & Chang, H. (April 2007). Theoretically comparing single-pool and multiple-pool designs regarding test security. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago.
92. Cheng, Y., & Chang, H. (March 2008). A new heuristic for parallel form assembly based on information curve matching. Paper presented at the annual meeting of the National Council on Measurement in Education, New York.
93. Dai, D., & Chang, H. (March 2008). Cognitively based assessment design and analysis: substantive applications. Paper presented at the annual meeting of the American Educational Research Association, New York.

94. Ahmed, U. & Chang, H. The Impact of Item Selection Method in CAT-DIF Analysis, Paper presented at the 73rd Annual Meeting of the Psychometric Society Meeting, June 29- July 2, 2008, Durham, NH.
95. Wang, C. & Chang, H. Continuous α -stratification index for computerized item selection, Paper presented at the 73rd Annual Meeting of the Psychometric Society, June 29 to July 2, 2008, Durham, NH.
96. Chang, H., Ryan, K., Ali, U., & Wang, C. (April 2009). Building effective CATs based existing state assessment infrastructure, Paper presented at the annual meeting of National Council on Measurement in Education, San Diego, CA.
97. Liu, H, Ding, S, & Chang, H. (April 2009). Developing cognitive diagnostic CAT for Chinese K-12 education: An innovative assessment for improving student learning, Paper presented at the annual meeting of National Council on Measurement in Education, San Diego, CA.
98. Wang, C., & Chang, H. (April 2009). Determining appropriate test length for linear test: Stratified forward selection method, Paper presented at the annual meeting of National Council on Measurement in Education, San Diego, CA.
99. Ali, U., & Chang, H. (2009). The equi-percentile matching-grouping method for Mantel-Haenszel-based DIF detection in CAT setting. Paper presented at the annual meeting of National Council on Measurement in Education, San Diego, CA.
100. Wang, C., & Chang, H. (June 2009). Multidimensional Adaptive Testing: The Application of Kullback-Leibler Information. Paper presented at the 2009 GMAC Conference on Computerized Adaptive Testing, Minneapolis, MN.
101. Chang, H., Douglas, J., & Wang, C. (June 2009). Obtaining Reliable Diagnostic Information through Constrained CAT. Paper presented at the 2009 GMAC Conference on Computerized Adaptive Testing, Minneapolis, MN.
102. Chang, H., Wang, C., & Boughton, K. (July 2009). A Simplified KL Information Index (SKI) for multidimensional computerized adaptive tests. Paper presented at the 74th Annual Meeting of the Psychometric Society, Cambridge, UK.
103. Wang, C., Chang, H., & Boughton, K. (July 2009). Some theoretical results concerning KL information in MIRT. Paper presented at the 74th Annual Meeting of the Psychometric Society, Cambridge, UK.
104. Bakker, M., & Chang, H. (July 2009). Constrained item selection in computerized classification testing. Paper presented at the 74th Annual Meeting of the Psychometric Society, Cambridge, UK.

105. Liu, HY., You, XF., Wang, WY., Ding, SL, & Chang, H. (May 2010). Large-scale applications of cognitive diagnostic computerized adaptive testing in China. Paper presented at the Annual Meeting of National Council on Measurement in Education, Denver, CO.
106. Wang, C., & Chang, H. (May 2010). Restrictive stochastic item selection methods in cognitive diagnostic computerized adaptive testing. Paper presented at the Annual Meeting of National Council on Measurement in Education, Denver, CO.
107. Tao, J., Shi, N, & Chang, H. (May 2010). Optimal item-weighted WLE methods for ability estimation. Paper presented at the Annual Meeting of National Council on Measurement in Education, Denver, CO.
108. Guo, Y., & Chang, H. (May 2010). Improving item pool usage for computerized adaptive testing. Paper presented at the Annual Meeting of National Council on Measurement in Education, Denver, CO.
109. Lin, H., Li, F., Shen, L., & Chang. (July 2010). An adaptive preset approach for a linear fixed-length computer-based licensure exam. Paper presented at the 75th Annual Meeting of the Psychometric Society, Athens, GA.
110. Chang, H., Tao, J., & Wang. (July 2010). The item-weighted likelihood method for computerized adaptive testing. Paper presented at the 75th Annual Meeting of the Psychometric Society, Athens, GA.
111. Lim, E., Chang, H., & Zhang, J. (July 2010). The effectiveness of using multiple item pools to increase test security in computerized adaptive testing. Paper presented at the 75th Annual Meeting of the Psychometric Society, Athens, GA.
112. Zheng, Y., Chang, C., & Chang, H. (July 2010). Content-balancing strategy in computerized adaptive patient-reported outcomes measure. Paper presented at the 75th Annual Meeting of the Psychometric Society, Athens, GA.
113. Wang, C. & Chang, H. (July 2010). Item selection in multidimensional computerized adaptive testing -- the new application of Kullback-Leibler information. Paper presented at the 75th Annual Meeting of the Psychometric Society, Athens, GA.
114. Ali, U. & Chang, H. (July 2010). Developing item selection methods for polytomous CAT. Paper presented at the 75th Annual Meeting of the Psychometric Society, Athens, GA.
115. Chang, H. (April 2011). Making computerized adaptive testing a diagnostic tool. Paper presented at the Annual Meeting of National Council on Measurement in Education, New Orleans, LA.
116. Lin, H., Li, F., Shen, L. & Chang, H. (April 2011). Adaptive pretest approaches and online calibration methods for linear fixed-length computer-based tests. Paper presented at the Annual Meeting of National Council on Measurement in Education, New Orleans, LA.

117. Chen, P., Xin, T., Ding, S., & Chang, H. (April 2011). Item replenishing in cognitive diagnostic computerized adaptive testing. Paper presented at the Annual Meeting of National Council on Measurement in Education, New Orleans, LA.
118. Wang, C., Bo Wang, B. & Chang, H. (April 2011). An enhanced approach to combine item response theory with cognitive diagnosis in adaptive tests. Paper presented at the Annual Meeting of National Council on Measurement in Education, New Orleans, LA.
119. Zheng, Y. & Chang, H. (April 2011). Automatic on-the-fly assembly for computer adaptive multistage testing Paper presented at the Annual Meeting of National Council on Measurement in Education, New Orleans, LA.
120. Chang, H. (July 2011). Building affordable CD-CAT systems for schools to address today's challenges in assessment. Paper presented at the 76th Annual and 17th International Meeting of the Psychometric Society, Hong Kong, China.
121. Wang, C., Chang, H. & Douglas, J. (July 2011). Modeling response time in computerized testing using semi-parametric linear transformation model. Paper presented at the 76th Annual and 17th International Meeting of the Psychometric Society, Hong Kong, China.
122. Kang, H.-A., & Chang, H.-H. (2012, July). Exploring the Mutual Information and Bayesian Optimality Item Selection Methods in Multidimensional Adaptive Testing. International Meeting of Psychometric Society, Lincoln, NE.
123. Chang, H. & Ying, Z. (April 2012). Computerized adaptive testing and multistage testing: in which direction should on-line testing go? Keynote Speech at the Division-D Luncheon and Business Meeting, the Annual Meeting of American Educational Research Association, Vancouver, Canada.
124. Zheng, Y., Nozawa, Y, Gao, X, & Chang, H. (April 2012). Multistage adaptive testing for a large-scale classification test: the design, heuristic assembly, and comparison with other testing modes. Paper presented at the Annual Meeting of National Council on Measurement in Education, Vancouver, Canada.
125. Wang, C. & Chang, H. (April 2012). Reducing bias in MIRT trait estimation. Paper presented at the Annual Meeting of National Council on Measurement in Education, Vancouver, Canada.
126. Lin, H. & Chang, H. (April 2012). Item selection methods in multidimensional computerized adaptive testing adopting polytomously scored items under multidimensional generalized partial credit model. Paper presented at the Annual Meeting of National Council on Measurement in Education, Vancouver, Canada.
127. Lim, E., Zhang, J., & Chang, H. (April 2012). The effect of multiple item pools for the possibly compromised items in computerized adaptive testing. Paper presented at the Annual Meeting of National Council on Measurement in Education, Vancouver, Canada.

128. Wang, C., Fan, Z., Chang, H.-H., & Douglas, J. (April 2013). A Semi-parametric model for jointly analyzing response times and accuracy in computerized testing, Paper presented at the Annual Meeting of National Council on Measurement in Education, San Francisco, CA.
129. Kang, H. & Chang, H-H. (April 2013). Bayesian experimental optimality design in multidimensional computerized adaptive testing. Paper presented at the Annual Meeting of American Educational Research Association, San Francisco, CA.
130. Chang, H-H. (April 2013). Meet Journal Editors: Journal Talks 9, AERA Invited Session at the Annual Meeting of American Educational Research Association, San Francisco, CA.
131. Zeng, W., Wang, C. & Chang, H-H. (April 2013). Improving latent trait estimation by the item-weighted methods for computerized adaptive testing. Paper presented at the Annual Meeting of American Educational Research Association, San Francisco, CA.
132. Wang, S. & Chang, H-H. (April 2013). The modified maximum likelihood procedure for CATs consisting of both dichotomous and polytomous items. Paper presented at the Annual Meeting of American Educational Research Association, San Francisco, CA.
133. Guo, R., Zheng, Y. & Chang, H-H. (April 2013). A stepwise test characteristic curve method to detect item parameter drift. Round Table Presentation at the Annual Meeting of American Educational Research Association, San Francisco, CA.
134. Wang, C., Zheng, Y. & Chang, H-H. (June 2013). Overview of multistage testing: history and future directions. Paper presented at the 78th Annual Meeting of the Psychometric Society, Arnhem, The Netherlands.
135. Chang, H-H., de la Torre, J., Johnson, M., Sinharay, S., Von Davier, M. & Wilson, M. (June 2013). Challenges in publishing psychometric manuscripts: advice from the Editors of Six Journals. Invited Panel-Discussion at the 78th Annual Meeting of the Psychometric Society, Arnhem, The Netherlands.
136. Chang, H-H. (2014, Oct). CD-CAT – from smart testing to smart learning. Paper presented at the 78th Annual Meeting of the International Association for Computerized Adaptive Testing, Princeton, NJ.
137. Kang, H.-A., & Chang, H.-H. (2014, Oct). Applications of Divergence Measures to Detect Drifted Items in Multidimensional Computerized Adaptive Tests. Paper presented at the meeting of the International Association for Computerized Adaptive Testing, Princeton, NJ.
138. Kang, H.-A., Ying, L., & Chang, H.-H. (2014, April). Item Response Theory Linking Procedures for Development of Extensive Item Pools. Paper presented at the annual meeting of the American Educational Research Association annual meeting, Philadelphia, PA.

139. Wang, S., Lin, H., Chang, H. & Douglas, J.A. (2014, April). Hybrid Computerized Adaptive Testing: From Group Sequential Design to Fully Sequential Design. Paper presented at the Annual Meeting of the National Council on Measurement in Education, Philadelphia, PA.
140. Kern, J. L. and Chang, H.-H. (2015, September). Maximizing all the information: Using response times in CAT. Paper to be presented at the annual meeting of the International Association of Computerized Adaptive Testing, Cambridge, England.
141. 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.
142. Kang, H.-A., Zheng, Y., & Chang, H.-H. (2015, Sep). Online Calibration for a Joint Model of Responses and Response Times in CAT. Paper presented at the meeting of International Association for Computerized Adaptive Testing, Cambridge, UK.
143. Kang, H.-A., & Chang, H.-H. (2015, Aug). Applications of Divergence Measures to Detect Drifted Items in Multidimensional Computerized Adaptive Tests. Paper presented at the meeting of Joint Statistical Meeting, Seattle, WA.
144. Kang, H.-A., Zheng, Y., & Chang, H.-H. (2015, July). Online Calibration for a Joint Model of Responses and Response Times in CAT. Paper presented at the meeting of International Meeting of Psychometric Society, Beijing, China.
145. Kang, H.-A., Zheng, Y., & Chang, H.-H. (2015, April). Online Calibration for a Joint Model of Responses and Response Times in CAT. Paper presented at the meeting of the National Council on Measurement in Education, Chicago, IL.
146. Kang, H.-A., Zhang, S., & Chang, H.-H. (2015, April). Jensen-Shannon Information as a Dual Objective Item Selection Criterion in CD-CAT. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.
147. Zhang, S., Chang, H.-H. (2015, July). Using Computerized Adaptive Testing under the DINO Model for Psychological Testing: A Simulation Study. Psychometrics in the Big Data Era Workshop at Beijing Normal University, Beijing, China.
148. Zhang, S., Chang, H.-H. (2015, July). From Smart Testing to Smart Learning: Theory, Research, and Potentials. Psychometrics in the Big Data Era Workshop at Beijing Normal University, Beijing, China.
149. Zhang, S., Chang, H.-H. (2015, September). The Relationship between Q-Matrix Specification and Item Exposure Rate in CD-CAT. Paper presented at the 2015 International Association of Computerized Adaptive Testing meeting, Cambridge, UK.

150. Zhang, S., Chang, H-H. (2015, July). Using Computerized Adaptive Testing under the DINO Model for Psychological Testing: A Simulation Study. Paper presented at the 80th International Meeting of the Psychometric Society, Beijing, China.
151. Guo, L., Zheng, C., & Chang, H-H. (2015, April). High-efficiency item selection algorithms for cognitive diagnostic computerized adaptive testing. Paper presented at the meeting of the National Council on Measurement in Education, Chicago, IL.
152. Wang, S., Fellouris, G., & Chang, H-H. (2015, September). A partial likelihood method for computerized adaptive testing to allow for response revision. Paper presented at the 2015 International Association of Computerized Adaptive Testing, Cambridge, UK.
153. Wang, S., Fellouris, G., & Chang, H-H. (2015, August). Sequential Design for Computerized Adaptive Testing Allowing for Response Revision. Paper presented at the Joint Statistical Meetings, Seattle, WA.
154. Guo, S., Zheng, C., & Chang, H-H. (April 2017). Bayesian expectation-maximization-maximization for the 3PLM. Paper presented at the meeting of the National Council on Measurement in Education, San Antonio, TX.
155. Chang, H-H., Kang, H-A., & Zhang, S. (April 2017). Using cognitive diagnostic computerized adaptive testing to help classroom learning. Paper presented at the meeting of the National Council on Measurement in Education, San Antonio, TX.
156. Zhang, S., Lin, H., Gao, X., & Chang, H-H. (April 2017) Measuring adaptive learning progress with cognitive diagnostic-computerized adaptive testing. Paper presented at the meeting of the National Council on Measurement in Education, San Antonio, TX.
157. Chang, H-H., Wang, S., & Zhang, S. (July 2017). Some promising advancements concerning CAT foundation and implementations. Paper presented at the 2017 International Meeting of the Psychometric Society, Zurich, Switzerland.
158. Zhang, S. & Chang, H-H. (July 2017). Multilevel hidden Markov model for learning under cognitive diagnosis framework. Paper presented at the 2017 International Meeting of the Psychometric Society, Zurich, Switzerland.
159. Li, A. & Chang, H-H. (April 2018). Weighted likelihood estimation method for response and response time. Paper presented at the meeting of the National Council on Measurement in Education, New York, NY.
160. Yang, J., Huang, L., Zeng, L., & Chang, H-H. (April 2018). Building a cloud-based CAT system for a large-scale language proficiency test. Paper presented at the meeting of the National Council on Measurement in Education, New York, NY.

161. Choe, E. & Chang, H-H. (April 2018). The asymptotic distribution of mean test overlap rate in computerized adaptive testing. Paper presented at the meeting of the National Council on Measurement in Education, New York, NY.
162. Zhang, S. & Chang, H-H. (April 2018). A multilevel logistic-hidden Markov model for learning under cognitive diagnosis. Paper presented at the meeting of the National Council on Measurement in Education, New York, NY.
163. Su, Y. & Chang, H-H. (April 2018). The performance of the constraint-weighted item selection procedures in variable-length CD-CAT. Paper presented at the meeting of the National Council on Measurement in Education, New York, NY.
164. Li, X. & Chang, H-H. (April 2018). Look-ahead content balancing method in variable length computerized classification testing. Paper presented at the meeting of the National Council on Measurement in Education, New York, NY.
165. Li, X., Williams, B., Lee, S., & Chang, H-H. (April 2018). Optimal scripted on-the-fly multistage tests with passages. Electronical board presentation at the meeting of the National Council on Measurement in Education, New York, NY.
166. Bradshaw, L., Chang, H-H., Marion, S., & Templin, J. (April 2018). Using classification-based psychometrics in local assessment systems for feedback. Coordinate session presented at the meeting of the National Council on Measurement in Education, New York, NY.
167. Douglas, J., Culpepper, S., Chang, H-H., Fellouris, G., Wang, S., Chen, Y., Ye, S. and Balamute, J. (April 2018). Techniques and software for Q-matrix estimation and modeling learning in cognitive diagnosis. Training session conducted at the meeting of the National Council on Measurement in Education, New York, NY.
168. Chang, H-H. (April 2018). From adaptive testing to adaptive learning. Invited paper presentation at the 2018 Annual Meeting of American Educational Research Association, New York, NY.

TEACHING

Courses Taught at the Chinese University of Hong Kong (1997-1998)

1. Learning Theory
2. Educational Measurement & Evaluation

Courses Taught at UT-Austin (2001-2005)

1. Measurement & Evaluation
2. Item Response Theory
3. Correlation & Regression
4. Introduction to Statistics
5. Multivariate Analysis

Courses at UIUC (2006-2018)

1. Theories of Measurement I

2. Theories of Measurement II
3. Measurement & Test Development Lab.
4. Hierarchical Linear Models
5. Computerized Adaptive Testing

Courses at Purdue (2018-)

1. Psychometrics with R-programming
2. Item Response Theory
3. Introduction to Educational Measurement
4. Psychometric Theory
5. Advanced Research in Measurement
6. Computerized Adaptive Testing

PROFESSIONAL SERVICE

Editorial:

2004-2009	The American Statistician	Associate Editor
2002-2010	Journal of Educational and Behavior Statistics	Associate Editor
2004-2011	Applied Psychological Measurement	Editorial Board Member
2005-2008	Educational Measurement: Issues and Practice	Editorial Board Member
2011-2018	Applied Psychological Measurement	Editor-in-Chief
2018-	ECNU Review of Education	Editorial Board Member
2018-	Journal of China Examinations	Editorial Board Member
2018-	Chinese/English J of Measurement and Evaluation	Editorial Board Member

Manuscript Reviewer:

The American Statistician, Applied Psychological Measurement, British Journal of Mathematical and Statistical Psychology, ETS Research Report Series, Journal of Behavioral and Educational Statistics, Journal of Educational Measurement, Psychometrika, Statistics Sinica

Consulting and Advisory Panels:

2018	Curriculum Associates, North Billerica, MA
2017	American College Testing Inc., Iowa City, IA
2017	Curriculum Associates, North Billerica, MA
2016	Educational Testing Service, Princeton, NJ
2016	Curriculum Associates, North Billerica, MA
2016	National Board of Osteopathic Medical Examiners, Chicago, IL.
2015	National Conference of Bar Examination, Madison, MI.
2015	Curriculum Associates, North Billerica, MA
2015	Educational Testing Service, Princeton, NJ
2014	Educational Testing Service, Princeton, NJ
2014	CTB McGraw-Hill, Monterey, CA
2014	College Board, New York, NY
2013	CTB McGraw-Hill, Monterey, CA
2013	Educational Testing Service, Princeton, NJ

2012 American College Testing Inc., Iowa City, IA.
 2010-2012 United Nations Educational, Scientific and Cultural Organization, Paris, France.
 2009 National Board of Osteopathic Medical Examiners, Inc. Chicago, IL.
 2009 Ministry of Education of Singapore.
 2008 Graduate Management Admission Council, McLean, VA 2000-2003.
 2007 Graduate Management Admission Council, McLean, VA 2000-2003.
 2007 Center for Educational Testing and Evaluation, U of Kansas, Lawrence, KS
 2005 National Board of Osteopathic Medical Examiners, Inc. Chicago, IL.
 2004-2005 College Board, New York, NY
 2003-2005 Educational Testing Service, Princeton, NJ
 2001-2003 Harcourt Educational Measurement, San Antonio, TX

Affiliations:

Since 2006 American Statistical Association
 Since 1991 American Educational Research Association
 Since 1991 National Council on Measurement in Education
 Since 1991 Psychometric Society
 Since 2010 American Psychological Association

Professional Service:

Panel member, National Institute of Mental Health (NIMH) (2001-2005)
 Panel member, Institute of Educational Sciences,
 Panel member IES, US Department of Education (2009-2012, and 2017)
 Panel member, National Science Foundation (2010-2012)

Conference Proposal Reviewer:

American Educational and Research Association
 National Council on Measurement in Education
 International Meeting of Psychometric Society

Grant proposal reviewer:

National Science Foundation
 National Institute of Mental Health
 Institute of Educational Sciences
 The Office of Chinese Language Council International
 University of Illinois Research Board
 University of Texas Research Programs
 Educational Testing Service Post Doctorial Fellowship Grant Program
 Edward J. Stemmler Medical Education Research Fund
 National Medical Examination Center (China)
 National Research Funding Competition (Chile)

ACADEMIC SERVICE:

2001-2005 Graduate Studies Committee for Master's in Statistics Program, UT-Austin
 2001-2005 Graduate Studies Committee for Foreign Language Education, UT-Austin
 2001-2005 Graduate Studies Committee for Educational Psychology, UT-Austin
 2005-2007 Internationalization Committee, College of Education, UIUC

2006-2007	Undergraduate Committee, Dept. of Psychology, UIUC
2006 -2008	Chair, Student Award Committee, Educational Psychology, UIUC
2005-2008	Student Award Committee, College of Education, UIUC
2007-2008	Division Chair, Quantitative & Evaluation Research, Educational Psychology, UIUC
2008-2013	Planning Committee for Establishing Confucius Institute, UIUC
2007-2009	LAS Council on General Education, UIUC
2008-2009	Faculty Search Committee, Educational Psychology, UIUC
2008-2009	Faculty Search Committee, Psychology, UIUC
2008-2009	Chair, Quantitative Specialization, College of Education, UIUC
2011	Faculty Promotion Committee, Department of Psychology, UIUC
2011-2012	Faculty Senate, UIUC
2010-2016	Graduate Student Admission Chair, Department of Psychology, UIUC
2016-	Students Award Committee, Department of Psychology, UIUC
2016	Faculty Search Committee, Department of Educational Psychology, UIUC
2017	Faculty Search Committee, Department of Educational Psychology, UIUC
2017	Faculty Promotion Committee, Department of Educational Psychology, UIUC
2017	Graduate Education Committee, Department of Psychology, UIUC
2018-	Director of the Purdue University Psychometric Instruction/Investigation Laboratory
2018-2021	External Promotion Reviewer for 10 Top Universities
2018-2021	Award Committee, Department of Educational Studies, Purdue University
2019-	International Committee, College of Education, Purdue University
2019-	Curriculum Committee, College of Education, Purdue University
2021	University Working Group for Purdue Instruction 2.0: Recommendations for Classroom of the Future at Purdue

GRADUATE STUDENTS' SUPERVISION (After August 2018)

2018

- 1) Luyao Zhang (PhD committee member at UIUC)
- 2) Ying Guo (PhD committee member at UIUC)

2019 Xiaodan Tang (PhD committee member at University of Illinois at Chicago)

2020

- 1) Xiao Li (PhD Co-advisor at UIUC). She is currently data scientist at Microsoft Inc.
- 2) Xiaofeng Yu (PhD committee member at Beijing Normal University)
- 3) Yue Liu (PhD committee member at Beijing Normal University)
- 4) Meijuan Lin (PhD committee member at Beijing Normal University)

2021

- 1) Shuqi Zhou (PhD committee member at Purdue)
- 2) Nesibe Karakis (PhD committee member at Purdue)
- 3) Qiao Lin (PhD committee member at University of Illinois at Chicago)

Current Graduate Students:

- 1) Tong Wu (PhD Advisor at Purdue)
- 2) Xiuxiu Tang (PhD Advisor at Purdue),

- 3) David Arthur (PhD Advisor, Dept. of Statistics at Purdue)
- 4) Yuxiao Zhang (PhD Advisor at Purdue)
- 5) Yang Du (PhD Co-Advisor at UIUC)
- 6) Anqi Li (PhD Co-Advisor at UIUC)
- 7) Xiyu Wang (MS advisor at Purdue)

GRADUATE STUDENTS SUPERVISED (2003- 2018)

2003

- 1) Mohammad Adnan Alghorani (PhD committee member at UT-Austin). He is currently Professor of Psychology at United Arab Emirates University
- 2) Aimee Boyd (PhD committee member at UT-Austin). She is currently Principal Research Scientist at Curriculum Associates

2004

- 1) Laurie Davis (PhD committee member at UT-Austin). She is currently Principal Research Scientist at Curriculum Associates.
- 2) Soojin Kim (PhD advisor at UT-Austin).
- 3) Meghan McGlohen (PhD committee member at UT-Austin)
- 4) Xuili Xu (PhD committee member at). She is currently Research Scientist, Educational Testing Service, Princeton, NJ.

2005

- 1) Pei-Hua Chen (PhD advisor at UT-Austin). She is currently Associate Professor at National Chiao Tung University, Hsinchu City, Taiwan
- 2) TK Young (PhD advisor at UT-Austin)

2006

Lixiong Gu (PhD advisor at Michican State University). He is currently Senior Research Scientist, Educational Testing Service, Princeton, NJ.

2007

- 1) Megan Mayberry (PhD committee member at UIUC), Psychologist, Edward Hines, Jr. VA Hospital, US. Department of Veterans Affairs.
- 2) Jay Verkuilen (PhD committee member at UIUC). He is currently Associate Professor, The City University of New York
- 3) Rongchun Zhu (PhD committee member at UIUC). He is currently Senior Psychometrician, American College Testing Inc., Iowa City, IA.

2008

- 1) Ying Cheng (PhD advisor at UIUC). She is currently Full Professor at Norte Dame University, South Band, IN.
- 2) Minhee Seo (PhD advisor at UIUC)
- 3) Ying Liu (PhD committee chair at UIUC)
- 4) Cha-Yi Chui (PhD committee member at UIUC). She is currently Full Professor at Rutgers University.
- 5) Hui-Jeong Woo (PhD committee member at UIUC)

- 6) Ben-Roy Do (PhD committee member at UIUC). He is currently Associate Professor at National Central University, Taiwan
- 7) Yang Gao (PhD committee member at UIUC)

2009

- 1) Mendy Li (PhD Committee member at UIUC). She is currently Associate Professor at Boston College, Boston, BA.
- 2) Sae-Il Choi (PhD committee member at UIUC)
- 3) So-young Jang (PhD committee member at UIUC)
- 4) Stephanie Seiler (PhD committee member at UIUC). She is currently Lead Data Scientist at Humana, Bloomington, Illinois.
- 5) Yan Huo (PhD advisor at UIUC). She is currently Research Scientist, Educational Testing Service, Princeton, NJ.
- 6) Stephen B. Broomell (PhD committee member at UIUC). He is currently Associate Professor, Department of Social and Decision Sciences, Carnegie Mellon University, Pittsburgh PA.

2010

- 1) Jorja Jamison (PhD committee member at UIUC). She is currently Assistant Professor at Hazelden Betty Ford Graduate School of Addiction, Hopkins, Minnesota.
- 2) Jeanette Reinhardt (PhD committee member at UIUC). She is currently a Licensed Psychologist, München Germany.

2011

- 1) Usama Ali (PhD Advisor at UIUC). He is currently Senior Research Scientist, Educational Testing Service, Princeton, NJ
- 2) Ping Chen (PhD Advisor at UIUC). He is currently Associate Professor at Beijing Normal University, Beijing China
- 3) Julie Patterson (committee member)
- 4) Jeremiah Johnson (PhD Committee Member at UIUC), Senior Research Manager at UMass Donahue Institute, Shrewsbury, Massachusetts.
- 5) Chun-Hua Kang (PhD Committee Member at Beijing Normal University). She Associate Professor at Zhe Jiang Normal University, Jinhua, China
- 6) Wen Liu (PhD Committee Member at Beijing Normal University)

2012

- 1) Chun Wang (PhD Advisor at UIUC). She is currently Associate Professor at University of Washington, Seattle, WA.
- 2) Haiyan Lin (PhD Advisor at UIUC). She is currently Senior Data Scientist at American Nurses Association, Washington DC.
- 3) Collin Ruud (PhD Committee Member at UIUC)
- 4) Sun Joo Chung (PhD Committee Member at UIUC)

2013

- 1) Wei Wang (PhD Committee Member at UIUC). He is currently Associate Professor of Psychology, City University of New York, New York, NY.
- 2) Jin Jing (PhD Committee Member at UIUC). She is currently Data Scientist at Stitch Fix, Menlo Park, CA.

- 3) Michael Culberson (PhD Committee Member at UIUC). He is currently Senior Analyst at Denver Public Schools, Denver, CO.

2014

- 1) Yi Zheng (PhD Advisor at UIUC). She is currently Associate Professor of Education and Associate Professor of Statistics, Arizona State University
- 2) Anna Povona (PhD Committee Member at UIUC)
- 3) Honglin Sun (PhD Committee Member at UIUC)
- 4) Eun Sul Lee (PhD Committee Member at UIUC)
- 5) Diana Wang (PhD Committee Member at UIUC)
- 6) Phillip Chow (PhD Committee Member at UIUC). He is currently Assistant Professor at University at Virginia School of Medicine

2015

- 1) Chanjin Zhang (PhD Advisor at UIUC). He is currently Associate Professor of Educational Psychology, East China Normal University, Shanghai China
- 2) Paohua Tay (PhD Advisor at UIUC). He is currently Deputy Director of Assessment, Ministry of Education, Singapore
- 3) Sean Cheng (PhD Committee Member at UIUC)
- 4) Liwen Liu (PhD Committee Member at UIUC), Psychometrician at American Institute of Research, Washington, DC
- 5) Mengyang Cao (PhD Committee Member at UIUC). He is currently People Analytics Researcher, Facebook, Menlo Park, CA.

2016

- 1) Hyeon-Ah Kang (PhD Advisor at UIUC). She is currently Assistant Professor of Educational Psychology at UT-Austin
- 2) Rui Guo (PhD Advisor at UIUC). She is currently Senior Data Scientist, Google Inc., Mountain View, CA.
- 3) Shiyu Wang (PhD Committee Member at UIUC). She is currently Associate Professor of Educational Psychology at University of Georgia.
- 4) Seonghee Cho (PhD Committee Member at UIUC). He is currently Assistant Professor at North Carolina State University.
- 5) Shuai Wang (PhD Committee Member at UIUC). He is currently Associate Professor at Shanghai Jiao Tong University, Shanghai, China.

2017

- 1) Edison Choe (PhD advisor at UIUC). He is currently Psychometrician at Graduate Management Admission Council, Reston, VA
- 2) Justin Kern (PhD advisor at UIUC). He is currently Assistant Professor in the Department of Educational Psychology, UIUC
- 3) Sam Ye (PhD Committee Member at UIUC). He is currently Assistant Professor of Statistics, University of Missouri, Kansas City
- 4) Carol Chen (PhD Committee Member at UIUC). She is currently Director of Analytics at Stanford University Graduate School of Education.

2018

- Susu Zhang (PhD advisor at UIUC). She is currently Assistant Professor in Psychology at UIUC