

Can (Cathy) Shao

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EDUCATION	Ph.D. Candidate, Quantitative Psychology University of Notre Dame, Notre Dame, IN Advisor: Dr. Ying Cheng	May, 2016 (Expected)
	M.S., Applied and Computational Mathematics and Statistics University of Notre Dame, Notre Dame, IN	August, 2014
	B.S., Psychology Beijing Normal University, Beijing, China	July, 2011
HONORS AND AWARDS	Pearson Travel Award <i>International Meeting of the Psychometric Society</i>	2015
	Conference Presentation Grant <i>Graduate Student Union, University of Notre Dame</i>	2014 & 2015
	In-Progress Research Award <i>American Educational Research Association Division D</i>	2014
	Student Travel Grants (one of five awardees) <i>International Association for Computerized Adaptive Testing</i>	2014
	First Place Poster <i>American Educational Research Association Division D Research Gala</i>	2014
	Notebaert Professional Development Award <i>Arts & Letters Programs, University of Notre Dame</i>	2014
	Research Fellowship for Undergraduate Study <i>Institute of Psychology, Chinese Academy of Sciences</i>	2009
RESEARCH INTERESTS	Item Response Theory, Psychometric Methods	
PUBLICATIONS	Shao, C. , Li, J., & Cheng, Y. (in press). A change-point based method for test speededness detection. <i>Psychometrika</i> . DOI: 10.1007/s11336-015-9476-7.	
	Cheng, Y., Shao, C. , & Lathrop, N. Q. (2015). The mediated MIMIC model for understanding the underlying mechanism of DIF. <i>Educational and Psychological Measurement</i> . DOI: 10.1177/0013164415576187.	
	Cheng, Y., Patton, J. M., & Shao, C. (2014). a-Stratified Computerized Adaptive Testing in the Presence of Calibration Error. <i>Educational and Psychological Measurement</i> . DOI: 10.1177/0013164414530719.	

Jean-Pierre, P., Cheng, Y., Paskett, E., **Shao, C.**, Fiscella, K., & Winters, P. (2014). Item response theory analysis of the patient satisfaction with cancer-related care measure: a psychometric investigation in a multicultural sample of 1,296 participants. *Supportive Care in Cancer*, 1-12.

Shang, J., Fu, Q., Dienes, Z., **Shao, C.**, & Fu, X. (2013). Negative affect reduces performance in implicit sequence learning. *PloS one*, 8(1), e54693.

Ping, Y., Feng, Q., & **Shao, C.** (2010). The effect of gender and emotion on learning. *Knowledge Economy*, Vol. 9, pp. 152-153. (in Chinese).

Shao, C., & Liu, F. (2010). Effects of emotional pictures on implicit memory between genders. *China Medicine Hygiene*, Vol. 11, No. 10, pp. 152-154. (in Chinese).

Shao, C., & Wang, X. (2010). Effects of implicit self-esteem on implicit envy. *Chinese Health*, Vol. 29, pp. 270-273. (in Chinese).

Wang, X., & **Shao, C.** (2010). Measurement of female consumers' preference for discount using the threshold method. *China Science and Technology Information*, pp. 206-210. (in Chinese).

Shao, C., Gao, M., & Wang, J. (2010). Attention-distribution on audiovisual channel of English-Chinese bilingual speakers in remembering words. *Chinese Health*, Vol. 29, No. 10, pp. 296-299. (in Chinese).

PAPERS UNDER REVIEW

* Lathrop, N. Q., **Shao, C.**, & Cheng, Y. *A procedure to select more invariant items for the anchor in tests of DIF.*

Jean-Pierre, P., **Shao, C.**, Cheng, Y., Wells, K., Paskett, E., Fiscella, K., & Patient Navigation Research Program group. *Patient Satisfaction with Interpersonal Relationship with Navigators (PSN-I) Scale: confirmatory factor structure and Item Response Theory analysis in a culturally and socioeconomically diverse sample of 751 cancer patients.*

PAPERS IN PREPARATION

Shao, C., Cheng, Y., & Li, J. *A data cleansing procedure based on change-point analysis to improve item parameter estimation in presence of test speededness.*

Shao, C., Kim, D., Cheng, Y., & Luo, X. *A change-point based method for warm-up effect detection in Computerized Adaptive Testing.*

SELECTED PRESENTATIONS

Shao, C., Lathrop, N. Q., & Cheng, Y. (2015, July). *A procedure to select more invariant items for the anchor in tests of DIF.* Paper presented at the 2015 Annual Meeting of the Psychometric Society, Beijing, China.

* The first two authors made equal contributions and are listed alphabetically.

Shao, C., Cheng, Y., & Lathrop, N. Q. (2015, April). *Anchor selection embedded mediated MIMIC method for understanding the DIF mechanism*. Invited paper presented at the 2015 Annual Meeting of the American Educational Research Association Division D, Exemplary Work of Promising Researchers, Chicago, IL.

Shao, C., Kim, D., Cheng, Y., & Luo, X. (2015, April). *Detection of warm-up effect in CAT using change-point analysis*. Poster presented at the 2015 Annual Meeting of the American Educational Research Association Division D In-Progress Research Gala, Chicago, IL.

Shao, C., Kim, D., Qian, H., & Cheng, Y. (2015, April). *DIF detection of mixed-format tests using the MIMIC model*. Paper presented at the 2015 Annual Meeting of the American Educational Research Association, Chicago, IL.

Jean-Pierre, P., **Shao, C.**, & Cheng, Y. (2015, March). *Patient Satisfaction with Interpersonal Relationship With Navigators: Item Response Theory analysis in a multicultural sample of 751 cancer patients*. Poster presented at the 2015 International Convention of Psychological Science, Amsterdam, Netherlands.

Shao, C., Kim, D., Cheng, Y., & Luo, X. (2014, October). *A change-point based method for warm-up effect detection in Computerized Adaptive Testing*. Paper presented at the 2014 meeting of International Association for Computerized Adaptive Testing, Princeton, NJ.

Shao, C., Li, J., & Cheng, Y. (2014, July). *Test speededness detection based on the detection of change-point*. Paper presented at the 2014 Annual Meeting of the Psychometric Society, Madison, WI.

Shao, C., Cheng, Y., & Lathrop, N. Q. (2014, April). *Anchor selection embedded mediated MIMIC method for understanding DIF mechanism*. Poster presented at the 2014 Annual Meeting of the American Educational Research Association Division D In-Progress Research Gala, Philadelphia, PA.

Wang, X., & **Shao, C.** (2013, October). *Review of methodology of detecting aberrant responses in Computerized Adaptive Testing*. Paper presented at the 2013 Northeastern Educational Research Association Annual Conference, Rocky Hill, CT.

Cheng, Y., **Shao, C.**, & Lathrop, N. Q. (2013, August). *Mediated MIMIC model approach in understanding the underlying mechanism of DIF*. Poster presented at the 2013 American Psychological Association Annual Convention, Honolulu, HI.

Shao, C., Jean-Pierre, P., Cheng, Y., Paskett, E., & Fiscella, K. (2013, June). *Latent trait examination of the Patient Satisfaction with Interpersonal Relationship with Navigator Scale in a multicultural sample: an Item Response Theory analysis approach*. Poster presented at the 2013 Annual Meeting of the Multinational Association of Supportive Care in Cancer, Berlin, Germany.

Shao, C., & Cheng, Y. (2013, April). *Review of literature on item cloning, item families and template*. Paper presented at the 2013 Annual Meeting of the National Council on Measurement in Education, San Francisco, CA.

Cheng, Y., **Shao, C.**, & Lathrop, N. Q. (2013, April). *The mediated MIMIC model for DIF detection*. Paper presented at the 2013 Annual Meeting of the National Council on Measurement in Education, San Francisco, CA.

Lathrop, N. Q., Cheng, Y., Patton, J. M., & **Shao, C.** (2013, April). *Selection of anchor items in MIMIC tests of DIF*. Paper presented at the 2013 Annual Meeting of the National Council on Measurement in Education, San Francisco, CA.

Shao, C., Cheng, Y. & Jean-Pierre, P. (2013, April). *Item Response Theory analysis of the Patient Satisfaction with Cancer Related Care: Psychometric evaluation in a multicultural sample of 1,296 participants*. Poster presented at the Harper Cancer Research Institute 2nd Annual Research Day, Notre Dame, IN.

RESEARCH EXPERIENCE

Research Internship

ACT

Supervisor: Drs. Rongchun Zhu, Xiaohong Gao

June - August, 2105

Project I

Effect of Test Speededness on Item Parameter Estimation and Equating

- Compared three different methods of dealing with test speededness and investigated their impact on item parameter estimation and equating.

Project II

Exploration of Test-Completion Time Patterns in WorkKeys Assessment

- Evaluated the response time patterns of examinees at different ability levels
- Established response time based methods for aberrant response detection

Bi-factor Modeling for Subscore Reporting of NCLEX-RN

Supervisor: Dr. Ying Cheng, University of Notre Dame December, 2014 - present

Funded by: National Council of State Boards of Nursing

- Conducted extensive literature review on bi-factor model
- Assessed possible confounding effect between model misfit and missingness

Research Internship

National Council of State Boards of Nursing

Supervisor: Dr. Doyoung Kim

May - July, 2014

Project I

Detection of Warm-up Effect in CAT Using Change Point Analysis

- Investigated ability recovery under 1PL and 2PL models with warm-up effect.
- Detected warm-up effect using the change-point based method.

Project II

Impact of Item Parameter Drift on Anchoring Methods in CAT

- Compared the performance of item anchoring and person anchoring on pretest item calibration in the presence of item parameter drift.

Project III

Differential Item Functioning Detection of Mixed Format Test Using MIMIC Model with Bootstrap

- Detected the DIF items for mixed format test using different DIF free set selection methods.
- Compared the detection performance with and without using Bootstrap standard error.

Detecting Aberrant Responses in Multidimensional IRT Data under Bayesian Framework

Supervisor: Dr. Zhiyong Zhang, University of Notre Dame 2013

- Proposed a Bayesian method which compares the posterior sum score with the true response sum to detect aberrant responses under bi-factor MIRT model.

The Effect of Anchor Set Size on Vertical Scaling

Supervisor: Dr. Lijuan Wang, University of Notre Dame 2013

- Investigated the effect of anchor set size on vertical scaling under IRT model with different test length.

Analysis of the My Math Test under IRT and CAT

Supervisor: Dr. Ying Cheng, University of Notre Dame 2012 - 2013

Drs. John T. Behrens, Yuehwei Chien, Pearson Funded by: Pearson

- Conducted literature review on item cloning, item families, and template.
- Evaluated the CAT simulator in terms of response generation, maximum information item selection, content balancing, and control for queuing.

Performance Evaluation of Person-Fit Statistics for Detecting Aberrant Responses in Multidimensional IRT Data

Supervisor: Drs. Zhiyong Zhang, Ying Cheng, University of Notre Dame 2012

- Investigated the Person-fit using l_z statistic for five aberrant response types simulated under three-dimensional two-parameter bi-factor MIRT model.

Analysis of the Quality of Administrative Aptitude Test Based Using Item Response Theory and Classical Test Theory Graduation Thesis

Supervisor: Drs. Hongsheng Che, Ran Bian, Beijing Normal University 2011

- Investigated the test structure using IRT and CTT models.
- Diagnosed the subscales and promoted new methods for item selection.

MvIRT Software Evaluation

Supervisor: Drs. Peter Bentler, Eric Wu, UCLA 2010

- Validated MvIRT under Rasch, 2PL and Partial Credit models.
- Evaluated the performance of MvIRT, BILOG-MG and MULTILOG.

Data Analysis on Standardized Tests

Supervisor: Dr. Hongsheng Che, Beijing Normal University 2009 - 2010

- Conducted exploratory data analysis on the Chinese University Entrance Examination structure.
- Delivered elaborated data analysis on the Standard Mandarin Chinese Proficiency Test for non-native speakers in terms of internal reliability, validity, and item calibration.

COMPUTER SKILLS	<i>Statistical Package:</i> R, Mplus, BILOG-MG, PARSCALE, MULTILOG, SAS, WIN-STEPS, SPSS, Matlab, OpenBUGS, EQS, PIE, CIPE <i>Other:</i> Linux, L ^A T _E X, E-PRIME, INQUISIT, Microsoft Word, Excel	
TEACHING EXPERIENCE	Guest Lab Instructor and Teaching Assistant	<i>University of Notre Dame</i>
	Fall 2014: Item Response Theory	<i>Supervisor: Dr. Ying Cheng</i>
	Teaching Assistant	<i>University of Notre Dame</i>
	Spring 2014: Experimental Psychology I: Statistics	<i>Supervisor: Dr. Ying Cheng</i>
	Teaching Assistant and Lab Instructor	<i>University of Notre Dame</i>
	Fall 2013: Experimental Psychology I: Statistics	<i>Supervisor: Dr. Bradley Gibson</i>
PROFESSIONAL MEMBERSHIPS	National Council on Measurement in Education (NCME) American Educational Research Association (AERA) International Association for Computerized Adaptive Testing (IACAT) Psychometric Society	
INTERNSHIPS	Research Intern	June - August, 2015
	<i>ACT</i>	
	Research Intern and Statistical Consultant	May - July, 2014
	<i>National Council of State Boards of Nursing</i>	
	Psychology Counseling Editor	October, 2009 - June, 2011
	<i>Network of Central Media Department of China</i>	
	Assistant of Human Resources Manager	February - March, 2010
	<i>People's Bank of China</i>	
LEADERSHIP & SERVICE WORK	Faculty Meeting Student Representative	August, 2015 - present
	<i>Department of Psychology, University of Notre Dame</i>	
	Reviewer	2015
	<i>Applied Psychological Measurement</i>	
	Reviewer	2015
	<i>2016 NCME Annual Meeting, Graduate Student Poster Session</i>	
	Reviewer	2015
	<i>2016 AERA Annual Meeting, Division D</i>	
	Volunteer for the Habitat Build	July, 2015
	<i>Iowa Valley Habitat for Humanity</i>	
	Quantitative Studies Group Seminar Organizer	January - May, 2015
	<i>Department of Psychology, University of Notre Dame</i>	

Graduate Advisory Committee <i>Department of Psychology, University of Notre Dame</i>	August, 2014 - May, 2015
Reviewer <i>2015 NCME Annual Meeting, Graduate Student Poster Session</i>	2014
Vice President, Chinese Friendship Association <i>University of Notre Dame</i>	2011 - 2012
Volunteer of the Beijing Paralympics Games <i>Beijing Organizing Committee for the Olympic Games</i>	2008
Volunteer of the 29th Beijing Olympic Games <i>Beijing Organizing Committee for the Olympic Games</i>	2008

**SELECTED
COURSEWORK**

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| • Quantitative Methods I & II | • Statistical Inference I & II |
| • Item Response Theory | • Longitudinal Data Analysis |
| • Multivariate Analysis | • Bayesian Statistics |
| • Structural Equation Modeling | • Stat Methods in Data Mining |
| • Generalized Linear Model | • Missing Data Analysis |
| • Psy Measurement & Test Development | • Computational Statistics |