

Pacific Rim Objective Measurement Symposium (PROMS) 2014 Conference Proceedings

Quan Zhang · Hong Yang
Editors

Pacific Rim Objective Measurement Symposium (PROMS) 2014 Conference Proceedings

Rasch and the Future



Springer

Editors

Quan Zhang
College of Foreign Studies
Jiaxing University
Jiaxing, Zhejiang
China

Hong Yang
College of Foreign Studies
Jiaxing University
Jiaxing, Zhejiang
China

ISBN 978-3-662-47489-1

ISBN 978-3-662-47490-7 (eBook)

DOI 10.1007/978-3-662-47490-7

Library of Congress Control Number: 2015942815

Springer Heidelberg New York Dordrecht London

© Springer-Verlag Berlin Heidelberg 2015

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made.

Printed on acid-free paper

Springer-Verlag GmbH Berlin Heidelberg is part of Springer Science+Business Media
(www.springer.com)

Foreword

Welcome Message from Host University



Prof. Quan Zhang Ph.D, Jiaxing University, China
Secretary of PROMS

Welcome Message from Chair of PROMS



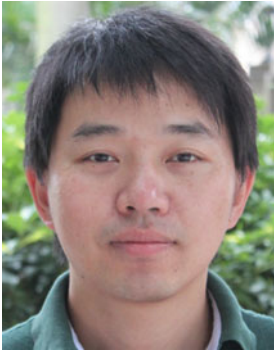
Prof. Robert F. Cavanagh, President of PROMS
Professor of Well-being Metrics, School of Education
Curtin University, Australia

Pre-Conference Workshops

Workshop I: Rasch Measurement Using WINSTEPS



Prof. Trevor Bond (Keynote Speaker)
The immediate Past President of PROMS
James Cook University, Queensland, Australia



Dr. Zi Yan
Vice President of PROMS
Hong Kong Institute of Education

Workshop II: Introduction to and Demonstration of Using TAM Software for IRT Analysis



Prof. Margaret Wu Ph.D.
Statistician and psychometrician
Victoria University in Melbourne, Australia

Workshop III: Invariant Measurement with Raters and Rating Scales



Prof. Jackson Stenner
Chairman, CEO, and Co-Founder of MetaMetrics Inc. USA

Workshop IV: Introduction to Lexiles and Developing Construct Models



George Engelhard, Jr., Ph.D. The University of Georgia, USA
And his teaching assistant: Shanna N. Ricketts, Emory University, USA

Keynote Speakers

An Argument Approach to Test Fairness: The Case of Multiple-form Equating in the College English Test



Prof. Yan Jin
Shanghai Jiao Tong University



Dr. Eric Wu
UCLA, USA

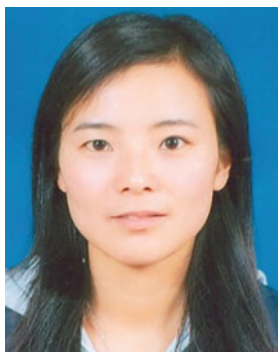
DELTA: A System for Diagnosing and Tracking English Competence in Chinese University Students



Alan Urmston
Hong Kong Poly U



Michelle Raquel
Hong Kong Poly U



Gwendoline Guan
Hong Kong Poly U

Foreword

Welcome Message from Host University

I am delighted to announce that the PROMS Board has decided the PROMS2014 symposium will be held in Guangzhou, China from August 4–6 2014 with pre-conference workshops scheduled for August 2–3 2014 and post-conference self-arranged events scheduled for August 7, 2014.

Over the past years, PROMS has been successfully hosted in many Pacific Rim countries and regions for the purpose of promoting research and contributing to the development of the Rasch Model. Following the inaugural PROMS symposium in 2012, held in Jiaxing, Zhejiang Province, China Mainland and the PROMS2013 symposium, Kaohsiung, Taiwan, we are now opening our arms to welcome all PROMS counterparts to Guangzhou, China.

The ideas and concepts regarding the Rasch Model were first introduced into China in the 1980s by Prof. Gui Shichun, my Ph.D. supervisor. Later, it was Prof. Gui who first utilized the Rasch Model in the form of the 10-year long (1990–1999) Equating Project for Matriculation English Test (MET). The results of Prof. Gui's MET received praise and adulation in China, but the following years did not witness significant Rasch-based application and research. With this in mind, we can see the PROMS2014 symposium meets the important need of providing an excellent introduction to the Rasch model and its application.

The PROMS2014 symposium will feature a slightly different schedule from past symposiums. First, the PROMS2014 symposium will have a longer time frame, three days instead of two, for the main conference. To quote Prof. Robert F. Cavanagh, “a three-day program reduces the number of papers presented concurrently. This increases attendance, sharing of work, learning from others, and giving more time for posters, symposia, and fireside chats”. A longer program enables more time for less formal activities. Second, bilingual experts will be invited to serve as interpreters and/or coordinators at pre-conference workshops to meet the needs of beginners and students, ensuring everyone gets the same keywords and commands on the screen.

Anyone seriously interested in research and development in the field of psychometrics or measurement will find such an international symposium and related workshops to be an excellent source of information about the application of the Rasch Model. In particular, I should mention the PROMS2014 symposium in Guangzhou would be of great benefit to postgraduate students from developing countries and researchers who seek to use the Rasch Model in their research activities. Academically, the PROMS2014 symposium tends to be more international. Just as Professor Mok said, “Instead of being confined within the Pacific-Rim region, participation of scholars from Europe will make PROMS more ‘International’”. Furthermore, something worth mentioning is that PROMS2012 proceeding has been officially published by Springer and PROMS2014 will have all the presented papers recommended to Springer, Educational Psychology and others to publish in the form of journal.

Finally, I should say, the city that the PROMS2014 symposium has chosen is unique not for its cosmopolitan size but for its local cuisine. In China it is common to hear people say: “Eating in China, Guangzhou is Number One!”

We look forward to meeting you in Guangzhou!

Prof. Quan Zhang Ph.D.

Senior visiting scholar to ETS

Senior research scholar at UCLA

Institute of Language Testing, University of Jiaying, Zhejiang Province, China

Ph.D. Supervisor, City University of Macau, SAR, China

A Welcome Message from Chair of PROMS

It is my pleasure to extend a warm welcome to the 2014 Symposium of the Pacific Rim Objective Measurement Society (PROMS). This symposium will be held in Guangzhou, China. Also, I need to sincerely thank Prof. Quan Zhang (Ph.D.), the Dean of the College of Foreign Studies and Director of the Institute of Language Testing at the University of Jiaying for his initiative and work as the Convenor of PROMS2014.

There are many good reasons why you should attend PROMS:

The keynote speakers and workshop presenters are all eminent scientists with cutting-edge expertise in Rasch measurement and its applications;

Students are encouraged to attend and present their work. The atmosphere is highly collegial and we value the contributions of all;

PROMS is highly supportive of early career researchers and the professors who attend are renowned for the support they provide to all participants;

The venue, Guangzhou (Guandong/Canton), is a prosperous metropolis full of vigour located along the south coastline of China, just across the border from Hong Kong, an ideal venue for PROMS business and social activities;

PROMS2014 will be the tenth symposium and follows highly successful meetings in Kuala Lumpur, Hong Kong, Taiwan, Tokyo, Hong Kong, Kuala Lumpur, Singapore, Jiaxing China and Taiwan.

PROMS is a multi-cultural event and typically includes presentations in the native language of the host country.

The core business of PROMS is the application of the Rasch Model in a diverse range of fields including Business, Counselling, Economics, Education, Health Care, Language, Measurement, Psychology, Quality Assurance, Statistics and Strategic Planning. The Society is supported by senior academics, researchers and scientists from Asia, Australia, North America and Europe. All share a vision of sustainable development that is informed by meaningful data and meaningful interpretations of these data. They have a common concern about the inadequacies inherent in many decades of Western Human Science measurement and the need to avoid replication of these shortcomings.

The Symposium program will be preceded by two days of workshops. These typically provide research training on: the basics of Rasch measurement using Winsteps; measuring English language performance with Lexiles; many-facets Rasch measurement using FACETS; computer adaptive testing; evaluating the quality of performance assessments; constructing measures; and multi-dimensional Rasch models.

Please join us to celebrate ten years of PROMS. We promise intellectual stimulation; highly enjoyable social activities and an engaging experience for participants and their families.

Professor Robert F. Cavanagh (Ph.D.)
Curtin University; Western Australia
Chair of the PROMS Board of Management

Acknowledgments

The following individuals and sponsors helped make the Pacific Rim Objective Measurement Symposium (PROMS), held in Panyu, Guangzhou, China (August 2–6, 2014), a great success. Their contributions in maintaining the quality of both the paper presentation review and the organization of the international academic conference are greatly appreciated.

Prof. Robert F. Cavanagh (Chair), Curtin University, Australia
Prof. Trevor Bond (Previous Chair), James Cook University, Australia
Prof. Zi Yan (Vice Chair), The Hong Kong Institute of Education
Prof. Quan Zhang (Secretary), University of Jiaying, China
Prof. Chew, Lee Chin, National Institute of Education, Singapore
Prof. George Engelhard, Emory University, USA
Dr. Iris Lee, National Institute of Education, Singapore
Prof. Ong Kim Lee, National Institute of Education, Singapore
Prof. Magdalena Mo Ching Mok, The Hong Kong Institute of Education, Hong Kong
Prof. Jackson Stenner, MetaMetrics, Inc., USA
Prof. Wen Chung Wang, The Hong Kong Institute of Education, Hong Kong
Dr. Mohd Zali Mohd Nor, Malaysia

Sponsors

Institute of Language Testing, Jiaying University, China
Foreign Language Teaching and Research Press, Beijing, China
City Training Institute (CTI) Guangzhou, China
MetaMetrics, USA
Springer, Germany



Conference Organizers

Pacific Rim Objective Measurement Symposium 2014 Local Committee

The Local Committee, headed by Prof. Quan Zhang, Ph.D., comprises a team of colleagues including assistant/associate professors and student volunteers who attended to matters such as conference dissemination and promotion, implementation and organizational details, and conference budget.

Conference Chair

Prof. Quan Zhang, Ph.D.

Professor, Faculty of Foreign Studies, University of Jiaying, China

Organizing Committee

Co-Chairs

Prof. Hong Yang

Associate professor, Faculty of Foreign Studies, University of Jiaying, China

Prof. Xiaoxi Hu

Professor, Liaison Office, Southern Medical University, Guangzhou, China

Prof. Shuangtian Qian

Professor, City Training Institute (CTI) Guangzhou, China

Members

Dan-wei Chai

City Training Institute (CTI) Guangzhou, China

Xiao-xi Hu

Southern Medical University, Guangzhou, China

Dong Wang

Southern Medical University, Guangzhou, China

Pei-sha Wu

City Training Institute (CTI) Guangzhou, China

Yang Shao

City University of Macau, Macau SAR

Chao-ran Yang

City Training Institute (CTI) Guangzhou, China

Qing-hong Zhang

City Training Institute (CTI) Guangzhou, China

Rou-xin Zhang

University of Jiaying, China

Mingzhu Miao

Institute of Language Testing, University of Jiaxing, China

Wei chun Zhang

City Training Institute (CTI) Guangzhou, China

Xiao-feng Zhang

City Training Institute (CTI) Guangzhou, China

And all the student volunteers of City Training Institute (CTI) Guangzhou, China.

Pre-Conference Workshops

Pacific Rim Objective Measurement Symposium (PROMS2014) was held in Panyu, Guangzhou, China Mainland from August 5–7, 2014 with four pre-conference workshops listed as follows:

Workshop I: Introduction to Rasch Measurement Using WINSTEPS

3.3.1. Prof. Trevor Bond and Dr. Zi Yan (August 2–3, 2014) who gave a full introduction to Rasch Measurement Using WINSTEPS. Previous knowledge of Rasch model was not required. The two-day workshop covered an introduction to Rasch model, the background knowledge and the basic ideas regarding Rasch measurement including computing ability estimates and item statistics, plotting item characteristic curves, estimating population characteristics and the like. Questions and answers and follow-up discussions were conducted in English with Chinese interpretation.

Workshop II: Introduction to Rasch Measurement Using WINSTEPS

3.3.2. Prof. Margaret Wu (August 2–3, 2014) who gave similar yet more detailed introduction to and demonstration of using TAM (Test Analysis Modules) software for IRT analysis. TAM (Kiefer, Robitzsch and Wu, 2012) is an IRT software program written in R. It is free for download. TAM can fit one-parameter, two parameter and multi-dimensional IRT models and can be used for dichotomous and partial credit item responses. The workshop was run in both English and Chinese to ensure all the participants of non-English majors got the ideas.

Workshop III: Introduction to Rasch Measurement Using WINSTEPS

3.3.3. Prof. Jackson Stenner (August 2, 2014), Chairman, CEO and Co-founder of MetaMetrics Inc, president of the Board of Directors of Institute of Objective Measurement, a board member for the National Institute for statistical sciences and a past board member for Duke Children's Hospital and the North Carolina Electronics and Information technologies Association, USA who gave an introduction to Lexiles and developing construct models.

Workshop IV: Introduction to Rasch Measurement Using WINSTEPS

3.3.4. Prof. George Engelhard (August 3, 2014) who gave a full introduction to Invariant Measurement with Raters and Rating Scales. The use of rating scales by

raters is a popular approach for collecting human judgments in numerous situations. This workshop utilized the principles of invariant measurement (Engelhard 2013) combined with lens models from cognitive psychology to examine judgmental processes that arise in rater-mediated assessments with focuses on guiding principles that can be used for the creation, evaluation and maintenance of invariant assessment systems based on human judgments.

The purpose of this workshop was to provide an introduction to the concept of invariant measurement for rater-mediated assessments, such as performance assessments. Rasch models provide an approach for creating item-invariant person measurement and person-invariant item calibration. This workshop extended these ideas to measurement situations that require raters to make judgments regarding performance assessments and also provided an introduction to the Many Facet Model, and its use in the development of psychometrically sound performance assessments. Illustrated were examples based on Advanced Placement English Literature and Composition assessments, as well as other large-scale writing assessments. The Facets computer program (Linacre 2007) was used throughout the workshop to illustrate the principles of invariant measurement with raters and rating scales.

Contents

1	Be Wary of What's Coming from the West: Globalisation and the Implications for Measurement in the Human Sciences . . .	1
	Robert F. Cavanagh and William Fisher Jr.	
2	Rasch Model: Status Quo and Prospect in China	17
	Quan Zhang and Tiantian Zhang	
3	The Psychometric Properties of the MISSCARE Nursing Tool . . .	25
	I. Blackman, E. Willis, L. Toffoli, J. Henderson, P. Hamilton, C. Verrall, E. Arbery and C. Harvey	
4	Booklet Design for a Longitudinal Study: Measuring Progress in New-Immigrant Children's Mathematics Achievement	43
	Pei-Jung Hsieh	
5	Indicators of Integration of Islamic Values in Human Knowledge	51
	Nik A. Hisham, Kamal J. Badrasawi and Noor Lide Abu Kassim	
6	A Rasch Measure of Test Takers' Attitude Toward the Versant English Test	65
	Jinsong Fan and Trevor Bond	
7	The Application of Rasch in the Validation of Corporate Citizenship Scale.	87
	Kamala Vainy Pillai, Rajah Rasiah and Geoffrey Williams	
8	Fluency: A Critically Important Yet Undervalued Dimension of L2 Vocabulary Knowledge	99
	Junyu Cheng, Joshua Matthews and John Mitchell O'Toole	

9	A Rasch-Based Approach for Comparison of English Listening Comprehension Between CET and GEPT	115
	Quan Zhang, Guoxiong He and Huifeng Mu	
10	A Rasch-Based Approach for Comparison of English Reading Comprehension Between CET and GEPT.	131
	Hong Yang and Mingzhu Miao	
11	Application of Rasch Model in Test Paper Quality Analysis—With the Case of Reading Literacy Pilot Test Paper for Grade 5–6 Students in Guangxi	145
	Jing Gong and Dehong Luo	
12	Development and Psychometric Evaluation of an Integrative Thinking Mode Scale Utilizing the Rasch Measurement Model . . .	155
	Zhuanmao Song and Bo Jiang	
13	Assessment of the Psychometric Properties of the Tampa Scale of Kinesiophobia Adapted for People with Dystonia Using Rasch Analysis	173
	I. Blackman, L. Bradnam and L. Graetz	
14	Reliability and Validity of the Malay Version of the SSIS Instrument for Students Aged 8–12 Years Old in Assessing Social Skills and Problem Behavior	189
	Zuraini Mat Issa and Wan Abdul Manan Wan Muda	
15	Sample Size and Chi-Squared Test of Fit—A Comparison Between a Random Sample Approach and a Chi-Square Value Adjustment Method Using Swedish Adolescent Data.	197
	Daniel Bergh	
16	Measuring the Effectiveness of Evaluation Processes for Diversified Undergraduate Students with Self-regulated Study—A Case Study in International School of Jinan University.	213
	Yufan Liu	
17	Correlation Analysis on Influencing Factors of English Writing and Non-English Major Tibetan College Students' English Writing Development	231
	Baina Xia	

18 An Empirical Case Study of TEM-8 Test Reliability. 239
Jianfang Xiao

**19 The Application of Descriptive Statistical Analysis of Foreign
Language Teaching and Testing 251**
Wu Wei and Li Lan

**20 Backwash Effect of English Testing on English Teaching
for Adults. 263**
Yuhuan Gong

**21 Recasting English for Environmental Science into
a SPOC—A Pilot Study in Wenzhou University 271**
Xiaoshu Xu and Xiuyu Gu

Appendix 287