



The Most Updated Development of PROMS in China

----- A report from Chinese Organizers

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Abstract: This article reports a series of Pacific-Rim Objective Measurement Symposium (PROMS) conferences organized by Chinese counterparts of Rasch model in China. Starting from PROMS 2023, Macau, China, the authors summarized all the pre-conference workshops run and keynotes delivered at each PROMS conference held in China from 2012-2023. Apart from these, the origin of Rasch model, the background knowledge, the theory and the practice regarding Rasch model are also addressed.

Keywords: Rasch Model, PROMS, Objective Measurement, WINSTEPS, Rasch-GZ

1 Introduction

1.1 PROMS 2023, Macau, China

The PROMS 2023 just held in Macau, China was a great success. This is the true international conference successfully held in China after the global fighting against the COVID-19 epidemic years since 2019. PROMS 2023 was organized by the World Sports University, Macau, SAR, China. A truly international conference attracting experts, researchers and scholars from the United States, Australia, Indonesia, Japan, Malaysia, Singapore, South Korea, the Philippines, China Hong Kong, China Macau and China Mainland.

PROMS2023, Macau, China is the premier international venue for Rasch researchers and practitioners to share new ideas, research results, and development

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Q. Zhang (ed.), *Proceedings of the Pacific-Rim Objective Measurement Symposium (PROMS 2023)*, Atlantis Highlights in Social Sciences, Education and Humanities 23,
https://doi.org/10.2991/978-94-6463-494-5_5

experiences. Apart from keynotes and parallel sessions, three parallel pre-conference workshops were run.

Pre-Conference Workshop (I) is about Generalized Linear Mixed Models and Rasch Measurement Theory jointly conducted by Prof. George Engelhard, Jr. from the University of Georgia, USA and Prof. Jue Wang from University of Science and Technology of China. The purpose of this workshop is to introduce participants to the use of generalized linear mixed models and Rasch Measurement Theory. An overview of generalized linear mixed models is provided. De Boeck and Wilson in [1] described the development of explanatory item response models (EIRM). The two professors illustrated the use of an R package called EIRM [2] to estimate several extended Rasch models including the Dichotomous Model, the Linear Logistic Rasch Model, Linear Regression Rasch Model, and Combined Covariates Rasch Model.

Prof. Zi Yan of the Education University of Hong Kong SAR, China run Pre-Conference Workshop (II) introducing Rasch Measurement Using WINSTEPS. This practical workshop was conducted in Chinese to introduce Rasch measurement to colleagues using Winsteps software. Theoretical and procedural presentations were followed by guided hands-on data analysis and interpretation. Participants were told to bring their own laptop computers (with Office and Adobe Reader pre-installed) to the workshop.

Pre-Conference Workshop (III) was jointly conducted by Prof. Quan Zhang from the World Sports University, Macau, China and his student Jingang Wei who is a computer engineer on Program of Education, Tarlac State University, the Philippines. This workshop introduced in both English and Chinese, Rasch-GZ¹: The fully updated (GITEST) Version. The workshop falls into three phases. During the first two hours, the use of item analysis as reference to moderate multiple-choice questions and test equating via linking items were addressed. Participants needn't have particular psychometric competence. As Rasch-GZ displays all the results in both Chinese and English, it would be easy to follow the menu operation. After coffee break, demonstration with real data was presented to show how to run Rasch-GZ. In the afternoon, they had questions and answers session.

¹ For details about RASCH-GZ, interested readers may refer to <https://www.rasch-gz.com>

1.2 The origin of Rasch model²

Rasch model was first proposed by Georg Rasch (1901- 1981), the Danish mathematician. In 1960, George Rasch published “Probabilistic Model for Intelligence and Attainment Tests” and his publication resolved the debate: “Is psychometric possible?” In his publication, Georg addressed how the rigorous standards of physical scientists can be used to solve the problems in social sciences. This became what we know as “Rasch model”. Since then, the model proposed by this Danish mathematician has found widely application in various research fields and has been extended from the initial processing data of dichotomous type to polychotomous type. Today, people call the model “Rasch model”.

1.3 The status quo of the Rasch model studies in China

Technically, among many measurement models, the Rasch model proposed by Georg Rasch is the most powerful yet feasible to use. Whether the data matrix is of dichotomous or polychotomous, they can be calibrated or scored via Rasch-based software. However, for quite a long time in China, such widely applied, powerful and feasible methods are mostly confined within small groups of Chinese researchers of language testing who are English majors. Most Chinese, particularly young Chinese non-English majored researchers may not fully understand the ideas, concepts, applications and efficiency inherent in Rasch methods. Theoretically, for example, in language testing, the classical testing theory (CTT) remains the general measurement model used by schools and examination departments across the China mainland. This is mainly reflected in such a common practice that the difficulty of test items thus obtained is actually calibrated on the proficiency level of the subject group. In turn, the level of subjects restricts the difficulty of test items. This has been the real situation in China’s academic circles. The unique feature inherent in Rasch model that item difficulties and subject abilities can be estimated independently of the sample is not universally known. Such an advantage needs dissemination and promotion among Chinese researchers. [3], [4], [5], [6], [7], [8], [9], [10], [11], [12], [13], [14], [15], [16], [17], [18], [19], [20], [21], [22], [23], [24], [25], [26], [27], [28]. It is motivated by this that the present authors have been making efforts in this line in China.

² <http://www.rasch.org/rmt/rmt193h.htm>

1.4 The Goals of PROMS³

PROMS is abbreviated from the “Pacific Rim Objective Measurement Symposium” initiated by Professor Trevor Bond in 1995. PROMS is non-profitable yet academic conference held each year in one the Pacific-rim countries and regions [14]. There three goals for PROMSers to achieve in the Pacific Rim. Briefly, PROMS inspires, promotes and increases the application of measurement based on Rasch model in both industries and academic sectors that contribute to the development in the Pacific Rim.

1.5 The Characteristics inherent in of PROMS

What characterizes PROMS conference can be summarized in three aspects. Firstly, PROMS is an annual international conference to be held in a Pacific Rim country or a region. The participants are all MA or Ph.D. candidates, Ph.D. supervisors, professionals, or practitioners engaged in Rasch-based research, objective measurement or assessment. Next, their research fields may not be the same, but they are all using the Rasch model to conduct their research. The software systems they used include but are not limited to (WINSTEPS), (FACET), (R-), (GITEST), (RASCH-GZ) etc. Thirdly, pre-conference workshop is a must. Usually, the conference organizers arrange parallel 1-2 day pre-conference workshops of different topics to promote the knowledge and the use of Rasch-based software. This has greatly popularized the research and application of the Rasch model for participants. In this way, PROMS conferences are believed to have provided an excellent academic platform for participants from the Pacific-rim countries and regions.

1.6 PROMS themes and keynote speakers

The themes of PROMS are all around “Rasch Model: Theory, Method and Practice”. From 2012 to 2023, about 55 well-known keynote speakers were invited from universities in Australia, Brazil, Malaysia, Denmark, Finland, Indonesia, Japan, Singapore, Sweden, the United States, Vietnam, China Hong Kong, China Macau, China Taiwan, and China Mainland. In particular, PROMS conferences held in China have tested the qualification of Chinese scholars in the research and application of Rasch model.

³ For more details, please refer to <http://proms.promsociety.org>

Ever since 2012 when PROMS conference was first organized by Jiaxing University, China, more well-known Chinese scholars were invited to deliver keynotes.

Professor Quan Zhang delivered the keynote speech to report to the Rasch community, for the first time, how they successfully completed the Ten-Year Matriculation English Test (MET) Equating Project via Rasch model under the guidance of the late famous Chinese linguist Professor Shichun Gui (1930-2017). The equating project was financially sponsored by the Examination Center under the Ministry of Education, China (1990- 1999).

In PROMS 2013 organized by National SunYat-sen University, Kaohsiung, China, Dr. Jing-Jyi Wu from National Chengchi University was invited to deliver the speech entitled “Assessing Creativity, Then and Now: Some Examples from Chinese Society”; Dr. Hua-Hua Chang from University of Illinois at Urbana-Champaign, USA presented keynote on “Combining Adaptive Testing with Adaptive Learning”; Professor Quan Zhang from Jiaxing University was invited to present the speech entitled “Language Testing in China: The Space between the Theory and Practice”;

In PROMS 2014 organized by City Training Institute, (CTI) Guangzhou, China, Prof. Yan Jin from Shanghai Jiaotong University and Dr. Eric Wu from UCLA were invited to make the keynote speech: “An Argument Approach to Test Fairness: The case of multiple-form equating in the College English Tests”.

In PROMS 2016 held in Xi’an, China, Professor Xiaoting Huang of Peking University was invited to give a keynote speech titled: "Investigating the Predictive Validity and Social Consequences of “Gaokao” .

In PROMS 2018 held by Fudan University, Professor Jin Yan from Shanghai Jiaotong University was invited to present a keynote speech addressing “Testing Tertiary-Level English Language Learners: The College English Test in China”; Dr. Xun Yan from University of Illinois at Urbana-Champaign, USA was invited to make a keynote regarding “How Does Rater Performance Change over time? Insights Gained from Many-Facet Rasch Modeling in Second Language Writing Assessment” .

In PROMS 2021, the first large-scale online PROMS conference was organized by Nanjing Normal University, China and was realized on ZOOM. Professor Dr. Kit Tai HAU, the invited keynote speaker from the Chinese University of Hong Kong focused on “Large-scale International Educational Assessment: Uses, Limitations, and Counter- Intuitive Findings.

In PROMS 2023 held by the World Sports University, Macau, China, Prof. Guanzhong Luo from South China Normal University was invited to deliver the keynote speech on How Rasch models work as AI engine in Assessment. While Professor Xiaoting Huang from Peking University addressed her keynote on “Investigating University Student’s Collaborative Problem Solving Competency Taking the Computational Psychometrics Approach”, the other two Chinese keynotes presented their speeches respectively. Professor Jue Wang from University of Science and Technology of China addressed “Rater Issues in Subjective Creativity Assessment: Psychometric Challenges and Future Directions” and Professor Yaru Meng from Xi’an Jiaotong University, China concentrated on “Bug-CDM Based Diagnosis of EFL Learners’ Listening Barriers through MCQ Incorrect Options”.

These keynote speeches are novel and refreshing to the international attendees. The convening of PROMS conferences has indeed provided Chinese scholars with an excellent opportunity for academic exchange and learning, and in turn has given foreign peers a comprehensive understanding of the time and the in-depth research, application, and development of Rasch model in China, which has played a great role in promoting further learning in the future.

2 Results

Ever since PROMS was first held in Jiaxing, China in 2012 with a great success, it has greatly contributed to popularizing, promoting, exchanging and improving the research and application of Rasch model for Chinese speaking learners and scholars, which is mainly reflected in the following five aspects.

2.1 Journal of applied measurement (JAM) book of abstract translation

Led by Prof. Magdalena Mo Ching MOK and Prof. Quan Zhang, and with joint efforts, the series translation of books have been published. They are [29] and [30]. Take [30] for example, it contains 205 abstracts germane to Rasch-based research work. This qualified team of translators consists of 45 Rasch experts with high bilingual proficiency working in 13 different organizations located in different parts of China. Each of these abstracts deals with Rasch measures in their research field, covering a variety of topics. They serve as good resources for Chinese speaking

researchers and students of non-English majors to be able to conduct their own Rasch-related research [24].

2.2 Monograph Translation

Apart from JAM book of abstract translation, monograph translation from English into Chinese is also well undertaken. Following PROMS 2012 in Jiaxing, Dr. Zi Yan (Education University of Hong Kong) worked as organizer and chair of the translation group to put [14] into Mandarin Chinese.

Prof. Magdalena Mo Ching MOK (Education University of Hong Kong) and Prof. Quan Zhang (Jiaxing University) organized another team to put Introduction to Rasch Measurement by Everett V. Smith, Jr and Richard Smith from English into Mandarin Chinese.

With such huge tasks accomplished, to quote Prof. Bond in [14], *two pillars are necessary. One is a qualified translation team who must possess a high level of understanding of Rasch measurement and bilingual proficiency so as to ensure the academic merits of the books could be accurately delivered from English into Chinese. The other is an appropriate publisher with deliberate academic taste and prestige that could endorse the value of the book in the eyes of its Chinese readers.*

Apart from serving as good resources, the translated book can be used as a text book for postgraduate students of applied linguistics in China [24].

2.3 Conference proceedings

For four consecutive years, the Springer published the PROMS Proceedings [22], [23], [25] and [26] Ever since the publication, the paper-based PROMS proceedings have been collected in major libraries and universities around the world. The e-books are included in the Springer Link Behavioral Science and Psychology e- book collection. This is accessible to readers around the world. The downloads and citations are increasing annually.

2.4 Growth of the Rasch-based publication

As shown in the figure below, the commencement of PROMS 2012, Jiaxing, China reveals the remarkable growth of the publication of Rasch measurement research [14].

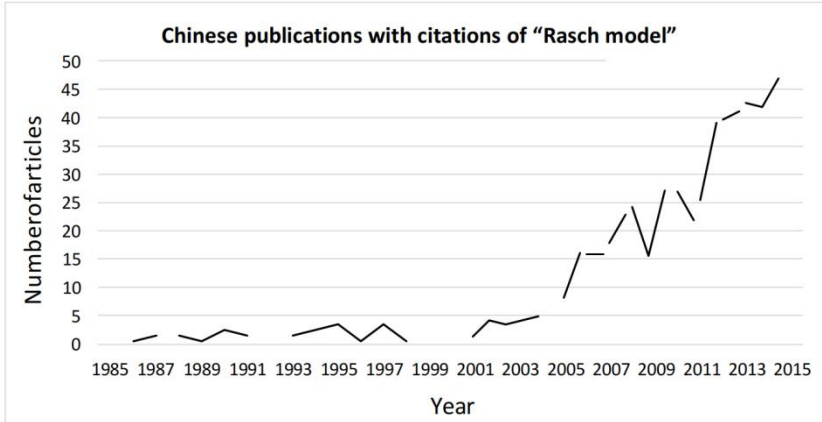


Fig. 1. Citations of Applying the “Rasch model”

And the participants attending PROMS conferences come from Australia, Brazil, China Hong Kong, China Macau, China Taiwan and China Mainland, Denmark, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Sweden, Vietnam, United States, United kingdom, and far beyond Pacific-rim regions and countries. After the successful PROMS 2022 Hanoi, Vietnam, PROMS 2023 returned to China. And Kuala Lumpur will open their arms to embrace PROMS 2024.

2.5 Rasch-GZ, the first Rasch-based system in both Chinese and English

To meet the on-going rapid development with an emphasis on further promoting the use of Rasch in China so as to be well geared with the international practice today, led by Prof. Quan Zhang, a group of Chinese professionals met during the COVID-19 pandemic period since 2019 and successfully developed RASCH-GZ, the first Rasch-based item analysis and test equating system which produces interpretation of result files in both Chinese and English. In this way, the understanding, dissemination and the beauty of Rasch model, or to be more exact, the Rasch-based research have been fully experienced or shared by a majority of other Chinese speaking researchers, especially those young researchers whose majors are not in English. The features of Rasch-GZ can be briefly listed below:

- (1) Capable of processing unlimited dichotomous data matrix;
- (2) Adjustable number of linking items prior to equating;
- (3) Chi-square test prior to equating;

- (4) Plotting and online technical supports;
- (5) Language (Chinese or English) can be selected.

The significance of developing Rasch-GZ lies in the following four aspects and is highly in conformity with the PROMS goals (1.4.):

- (1) Rasch-GZ is the first Rasch-based system for item analysis and test equating which generates result files in both Chinese and English;
- (2) The Rasch-GZ interface designed has well met the needs of Chinese speaking researchers;
- (3) The release of Rasch-GZ greatly facilitates the learning and application of Rasch model among Chinese learners;
- (4) Student version is free of charge, encouraging younger researchers to use Rasch model to conduct research.

3 Methods

Based on our practical experience, the most effective way to promote the learning and application of Rasch model is to run pre-conference workshops. The characteristics inherent in PROMS workshops so far run in China can be summarized in three aspects as follows. At the first place, the lecture content remains unchanged. For seven consecutive years, it is targeted at promoting the application of Rasch model and the introduction to and the specific use of (WINSTEPS), (FACET), (LEXILES) and (TAM), (R-studio) and (EQSIRT), or “How to use (WINSTEPS) to conduct Rasch Model Measurement”, and how to use (RASCH-GZ) to conduct item analysis and test equating, etc. Next, the workshop runners are all worldwide known professionals in the Rasch research field; for example, for six years running (2012-2021), Prof. Trevor Bond has been invited to give lectures. Thirdly, considering most participants are non-English majored teachers and graduate students, the workshop runners adopted instructions in both Chinese and English. In most cases, Bond is teaching and Zi Yan is interpreting. The question-and-answer sessions were in bilingual to ensure Chinese-speaking learners to better understand Rasch model. The pre-conference workshops are actually very popular classes to learn Rasch model for doing research, data processing as well as data analysis. It should be pointed out such a practice has achieved the best results because nowadays, not many people in China are proficient in using Rasch software skillfully.

Therefore, such pragmatic yet feasible workshops are necessary to continuously run in China.

4 Discussion

Prior to discussion, one thing worth mentioning is that: It is Prof. Magdalena Mo Ching, MOK of the Educational University of Hong Kong, Hong Kong SAR, China who introduced PROMS into China in 2011. And the next year PROMS 2012 was successfully held for the first time in Jiaying University, Zhejiang province, China.

There are at least four highlights. The first one is physical. The number of participants is increasing, and the academic impact becomes obvious in the Pacific-rim and beyond. The second one is sort of exciting: More Rasch-based research by Chinese scholars has entered into the world. The papers and keynote speeches presented at the conference reflect both the new trends and status quo of the research and application of Rasch model in specific fields. The third highlight is theoretical: PROMSers have come to be aware that there does exist a little difference between Rasch model and the one-parameter of IRT. The fourth one is fundamental. The working units home and abroad have attached great importance to PROMS and have given supports. This includes:

Atlantic Press/Springer Publishing House,
Beijing Higher Education Press,
City Training Institute (CTI) Guangzhou, China,
The British Embassy Cultural and Educational Association,
The Educational Testing Service (ETS),
Foreign Language Teaching and Research Press,
Fudan University,
Jiaying University,
Jiangsu Psychological Association
(Development and Educational Psychology Special Committee),
SAGE,
Shanghai Foreign Language Education Press,
Shanghai Jiaotong University,
Springer Nature,

Social Media,
 “Correction Network”,
 The US Meta Metrics Data Company,
 The World Sports University, Macau, SAR, China and related institute in
 Hangzhou.

5 Conclusion

Under the background of the rapid development of network technology in the era of AI, the present authors believe that Rasch model is a right model. The Rasch-based research direction will focus on more correct rather than on more accurate! At PROMS2021, Nanjing, China, Prof. Steven from Wesleyan University, USA was invited to deliver the keynote speech addressing “Better Measurement and Fewer Parameters! The True Value of Rasch over IRT!” Steven’s ideas were applauded by the online attending audience.

The list of Abbreviations used in the article

AI,	Artificial Intelligence
CTT,	Classical Testing Theory
IRT,	Item Response Theory
JAM,	Journal of Applied Measurement
MET,	Matriculation English Test
PROMS,	Pacific Rim Objective Measurement Symposium

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