

RMT

RASCH MEASUREMENT

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**Transactions of the Rasch Measurement SIG
American Educational Research Association**

Overview of The Issue

In this issue of RMT, we start with a summary of the results of the Summer 2019 survey about proposed RMT initiatives.

Next is an interview with David Andrich, conducted by Mike Peabody about the recently released book titled “A Course in Rasch Measurement Theory,” authored by David Andrich and Ida Marais.

Following the interview is a call for nominations for the AERA Rasch Measurement SIG Officers for the 2020 election cycle and nominations for the Benjamin Drake Wright Senior Scholar Award.

The issue rounds out with announcements about upcoming Rasch courses or workshops and a list of recent publications in *Journal of Applied Measurement*.

Please be on the lookout for more updates about the future of RMT!

Sincerely,

Your RMT Co-editors, Leigh and Stefanie

Rasch Measurement Transactions

www.rasch.org/rmt

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Results from the Summer 2019 Survey about RMT Initiatives

In the last issue of RMT, we posted the link to a survey about possible initiatives to improve the features and function of RMT. We also shared this via the Rasch Facebook page (<https://www.facebook.com/groups/raschmeasurement/>) and the ACER Rasch listserv (Rasch@acer.edu.au). We received 78 responses to the survey. While some of the feedback in the open-ended questions indicated positive thoughts about RMT as it is right now, along the lines of “don’t fix what ain’t broken”, there was a positive response to some of the initiatives and some suggestions for other initiatives that we hadn’t asked about in the survey (See Table 1 below). We are going to look into each initiative with more detail based on the interest expressed in the survey results and plan out a timeline of implementation. We hope to share some of that with you in the next issue.

DOIs: We took for granted that everyone knew what a doi was and how they worked. We apologize for that. A doi is a Digital Object Identifier (read more at <https://library.uic.edu/help/article/1966/what-is-a-doi-and-how-do-i-use-them-in-citations>). In many journals, each article gets

a DOI, which makes finding the article online easier. For instance, if you look at one of Stefanie Wind’s citations for a recent publication, you would find the DOI link at the end. If you click that link, it takes you directly to the article.

Wind, S. A. (2019). Do raters use rating scale categories consistently across analytic rubric domains in writing assessment? *Assessing Writing*. Advance Online Publication: <https://doi.org/10.1016/j.asw.2019.100416>

Two additional comments about doi’s need to be addressed: The first is whether it would be a doi for the entire RMT issue or each author(s)’ submitted piece and the second addressed costs. Since we are not a traditional journal, and publish everything in one large PDF file, the doi would be for an entire issue. Ken Royal investigated this possibility at the end of his tenure as RMT editor, and found that implementing dois would not be very expensive. From the discussions that we had with him, we believed that the same sources that cover the hosting of the RMT website could also cover the cost of the doi fees.

Table 1. Summary of Responses to Proposed RMT Initiatives

Initiative	Positive Response	Negative Response	Neutral Response	Number of Comments
DOIs	70.51%	3.85%	25.64%	22
YouTube videos	69.23%	11.54%	19.23%	31
Peer-reviewed Research Brief	80.77%	15.38%	3.85%	8
Ask the Experts	82.05%	2.56%	14.1%	17
Share Your Work	79.49%	5.13%	15.38%	13

Note: n = 78 survey participants.

YouTube videos: Approximately 69% of the participants indicated that videos that supplement RMT submissions would be beneficial and 51% indicated that they would include videos with their RMT submissions. While we work out the details of implementing this initiative, if you access to a YouTube channel or other media content host right now, please feel free to include a link to your short video in the text of your RMT submission.

Peer-reviewed Research Briefs: In addition to most responses indicating this would be beneficial, 25 people volunteered to be peer-reviewers. Thank you!!! We couldn't even consider this initiative without peer reviewers. A few comments indicated that 750 words was too short, so we could be open to change that to 2,000 words, which is the length of an AERA proposal. We are not trying to become a full-length, peer-reviewed journal. We are not trying to compete with any existing journals. This could be an outlet for work-in-progress or shorter pilot studies. In the words of one survey responder, "Hopefully it would clear the way for longer articles to be more substantive and present more novel findings." Having this section would not mean that every submission would be peer-reviewed. We would ask authors who want to have their submission be peer-reviewed to indicate this preference at the time of submission.

Ask the Expert: While 81% indicated that they thought this was a good idea, only 46% indicate that they would submit questions. There were 8 volunteers to be "experts". To address a concern that was mentioned more than once, this initiative wouldn't be a fast response for help, like a listserv would. The format would be a series of questions suggested by the editors or by RMT readers, and the editors would facilitate gathering

"expert" responses from those who volunteered to be experts.

Share Your Work: The feedback for this initiative was mostly positive, with the concerns being that we ensure the work is related to Rasch measurement and that the submitter include a doi or link to work, if possible. One related suggestion was to start a wiki page on Rasch.org that authors could add to themselves, which could possibly be a smarter way to accomplish the same result without adding to the length of the RMT issues. We can investigate this option with our webmaster, Mike Peabody.

Other suggestions: We also included a space for others to give suggestions or feedback on the current state of RMT. The list of suggestions included creating special issues, creating a section on teaching Rasch topics, surveying practitioners about use of software and other topics, and possibly updating some of the important, previously-covered topics from older RMT issues that are most referenced in publications.

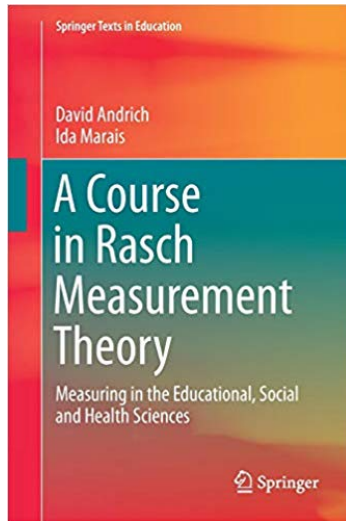
We will consider these suggestions along with the original initiatives in the coming months. In terms of improving our use of social media, Stefanie plans to tweet about the release of new RMT issues (follow our new Twitter page @RaschMeasure and Leigh will post on the Rasch FB page about new releases as well.

Your RMT Co-editors,

Leigh and Stefanie

Interview with David Andrich: “A Course in Rasch Measurement Theory”

David Andrich and Ida Marais have recently released a new book titled “A Course in Rasch Measurement Theory,” available through Springer Publications.



Here, we present an interview between Mike Peabody and David Andrich about the new book.

Mike:

The book describes course material collected over two decades of teaching Rasch measurement. What are some of the biggest changes in the way you've taught?

David:

It is over the past two decades that the course has had face-to-face lectures written out for on-line delivery. However, the teaching material developed over 40 years or so. Initially we printed out statistical tables, the conversion of odds to probabilities, and the analysis of any data was done using calculators with rearranged data to obviate

the need for iterations, and a rudimentary program which ran with punch-cards on a large main frame computer. However, because it was not easy to do analyses, it was necessary to focus on first principles and the theory behind what at the time seemed a very novel approach to measurement in the social sciences. The big change for this course material came just over two decades ago (1997) when we had the first version of the program RUMM, which we then called RUMM2010. Since then we had RUMM2020 and now RUMM2030.

Mike:

There are examples using the RUMM2030 software throughout the book. How has the increased availability of software impacted your teaching methods?

David:

The form of this program, written by Barry Sheridan with some key help on some aspects from insightful programmers and mathematicians, is written to help teaching. It is entirely interactive with no need to write macros or code. Once you know where to click, or where to touch with touch screen computers - it is like using an application on your smart phone. For example, deleting, rescoring, resolving, anchoring items, forming subtests, showing evidence of DIF, displaying the distributions of persons and items, and the many other functions, are all done interactively. And every statistical table has a graphic counterpart, and vice versa, where the statistical table can be copied and pasted into Excel for further specific analyses. That means that in making some theoretical point, or answering a particular question, such as what happens if we combine categories can be shown from a data set in seconds. That is a remarkable

advance compared to the original way of teaching.

The program is consistent with a philosophy we have of teaching this material, namely to put the user in control in making decisions about the quality of measurement achieved and where it might have broken down. We try to instill the need to look at multiple pieces of evidence, especially for misfit, in order to try to understand the data, and then to make professional, justifiable decisions, but not ones that are simply mechanistic in applying some significance level. These statistical techniques are taught of course, but they are not supposed to dominate. We could not illustrate that kind of philosophy without software such as RUMM. Of course now that the program has been written, the number of persons in the matrix for analysis is essentially limitless, the number of items can be well over a 100 (I forget the limit) and the number of categories per item can be up to 100, so the program is used in professional test and scale development.

Mike:

You start out with Classical Test Theory before moving into Rasch models. How important is it for students to understand CTT or can they just start with Rasch measurement without any background?

David:

Yes, students could start with Rasch measurement without studying any CTT. However, we include it for both pedagogical and practical reasons. From a pedagogical perspective, it seems one understands a theory, an approach, or principle, better if one can make comparisons and contrasts with others. This permits reflection on assumptions that might otherwise be taken for granted. In the early days of teaching

Rasch measurement, which really began only in the early 1970s, the emphasis was on its differences from CTT. However, despite defining contrasts, there are some elegant similarities as well. For example, although CTT begins with the total score on a test to characterize a person with no reference to any items, the total score with the same property is a consequence in Rasch measurement which begins with the response of a person to each item on a test. This seems rather neat and sets up other comparisons and contrasts. A contrast is the meaning of the total score: in CTT it is seen as the total score of a sample of items more or less of the same difficulty, whereas the relative difficulties of the items in Rasch measurement help define what it means to have more or less of the property measured.

The practical reason is that many people who engage with the course have come across, and some know a lot about, CTT. It seems useful to review this knowledge, show that the course builds on it rather than simply repudiates it. The work on CTT is oriented to lead into Rasch measurement. Alternatively, if they have not come across it before, and they begin reading psychometric literature, they will come across it and we think it will be useful if they already see the connections.

Mike:

I just taught my first course in Rasch measurement and found that the students were very eager to jump right into using the software. How do you balance the students' desire to start conducting their own analyses with the need for a strong theoretical and technical foundation?

David:

Yes, people can be eager to analyze data and our software facilitates it. RUMM2030 has a “Getting Started” manual that facilitates this. There is a danger that people can get output which they do not understand, but that is a common problem with all modern software for data analysis. The course still focuses on first principles and to show their understanding of these principles, students have small hand worked examples to carry out in their assigned work. By having the program do large and many calculations, it is possible to concentrate on the principles of measurement. We also provide some simulated or real data which they can analyse to complement the hand worked examples.

And one of the best ways of having someone become interested in the principles of Rasch measurement is to see what can be revealed from an analysis of his or her own data. In face-to-face teaching, I encourage students to bring in their own data, and then we can analyse it on the screen, my not having seen it before. That adds to the interest.

Sometimes they see relevant things in their data that they had not thought of before. It is hard to imagine that Rasch, with his team of research assistants, did all calculations by slide rule and graphics by hand. I bought Rasch a calculator in the early 1970s in exchange for his slide rule!

Mike:

Clearly, there's a lot of information in this book. How should instructors design their courses with this text? Specifically, do you have suggestions for using this book for a single semester course versus a two semester course sequence?

David:

The book does progress from elementary concepts and builds on them, and then comes back to elaborate and expand them. So one could simply work through the first half of the text. However, I think that the best way would be to construct one's own sequence of lectures and end point, identify where each topic is covered in the book, and noting that it might be covered in more than one place from more than one angle. A useful task is to ask students questions which are answered by a study of the material. What parts are selected might depend on the background of the students. If they have already done some graduate work, and they meet twice a week, then it should be possible to get to the advanced topics in one semester. Otherwise it might be useful to concentrate on basic principles and students can then study some of the more advanced material in their own time as their work or interest requires.

Mike:

Finally, what is the most important thing that you would like people to get from reading this book?

David:

It is difficult to give one thing because a number of ingredients are intertwined to give a whole philosophy of the application of the analysis techniques that are expected to be mastered. From a measurement perspective, these ingredients include: first, that measurement is characterised by features that are common to the physical (e.g. temperature, electrical resistance) and social sciences (e.g. language or mathematical proficiencies); second, that the principle of invariance of comparisons underpins these common features; third, that

to achieve measurement one has to work hard on the substantive variable and understand it, just as natural scientists do. From the perspective of the application of the probabilistic Rasch model, these include: first, that the model provides a criterion for the achievement of measurement and that it is not derived to model some particular data set; second, that in applying the model the task is to understand the data by studying multiple pieces of evidence and the task is not just to model the data; third, to make defensible professional decisions about the data rather than mechanistic statistical ones and to search for substantive explanations for any misfit that might be corrected empirically not merely statistically.

Call for Nominations for Rasch Measurement SIG Officers and Benjamin Drake Wright Senior Scholar Award

Dear Rasch SIG Members,
I am writing to encourage you to submit nominations for the officers of the Rasch Measurement SIG and award nominations for The Benjamin Drake Wright Senior Scholar Award, an AERA-sanctioned award.

The following positions on the Rasch Measurement SIG are open for election. The length of the term is indicated in parentheses, and all terms start at the end of the 2020 Annual Meeting.

- **Chair (2 years)**
- **Secretary (2 years)**
- **Treasurer (2 years)**

AERA policy requires that all elections be competitive; that is, there must be two or more candidates for each elected office. Only Regular Members of AERA can run for office. Candidates must also be current

members of the SIG and of AERA to serve as an officer. Self-nominations are welcome. Members who wish to nominate a candidate for consideration, or self-nominate themselves, should send a brief description on the qualifications of the nominee and how each nominee will contribute to the SIG to the current Secretary, Cari Herrmann Abell, at cabell@bscs.org. **Nominations are due Monday September 30, 2019.**

The *Benjamin Drake Wright Senior Scholar Award* shall be presented to an individual senior scholar for outstanding programmatic research and mentoring in Rasch measurement over the course of a career and who is still active in Rasch measurement research at the time the award is granted. It will be offered for the 3rd time in 2020. **The award is open to scholars worldwide. Membership in AERA or Rasch Measurement SIG is not required of the nominee.**

Eligibility Criteria for the Benjamin Drake Wright Senior Scholar Award

The Rasch Measurement SIG will bestow the Benjamin Drake Wright Senior Scholar Award upon a senior scholar who is active in Rasch measurement research at the time the award is granted (as attested to, for example, by research publications of recent date or current doctoral advisees) and who is nominated by members of the community as an exemplar in regard to the following two basic criteria. Potential nominees will have

- a. designed and carried out programmatic research that originates in Rasch measurement and helps understand crucial phenomena in model definition, parameter estimation, fit assessment, construct specification, novel applications, the place of Rasch measurement in the history and philosophy of science, etc., as represented in a corpus of

writings and research projects that have contributed to the theoretical development of the field as well as having been grounded empirically; AND

- b. developed the research capacity of the field, as attested to by the existence of a “school of thought” or intellectual heritage associated with the scholar’s name, a heritage that includes other individuals whom the scholar has had a direct influence in encouraging and helping become productive in Rasch measurement research or an identifiable domain of Rasch measurement research within which the nominee’s constructs and results are used regularly by other researchers.

The Rasch Measurement SIG recognizes also that other features of a person’s work might add to the criteria above, strengthening a nomination. Among the criteria that could add to the basic ones is one or more of the following. The nominee may also have made

- a) major contributions to broader fields of research in education, psychology, health care, or the social sciences, as represented by his or her participation (as author, speaker, or consultant) in research forums from fields other than Rasch measurement or by the recognition of his or her scholarship in other fields of inquiry (inclusive of all of educational research and the social sciences); OR
- b) major impact on the practice of Rasch measurement, as represented by the existence of policy documents, curriculum materials, professional development programs, or a corpus of practitioner- or public-oriented literature

to which the nominee has significantly contributed as an author.

The Award

The award includes a plaque and an invited address for the 2020 Rasch SIG business meeting at this years’ AERA conference. An honorarium is included, and some travel reimbursement may be available.

Nominations should include (and are restricted to) the following:

Individuals will be nominated via a letter of nomination emailed to the Convener of the Awards Committee proposing the name of the nominee and describing the grounds on which the nominee meets the requirements for the award. Three criteria should be addressed in the letter:

- A brief (no more than 250-word) description of the program of research carried out by the nominee;
- A list of significant publications representing the contributions described; and a list of scholars who have been significantly affected by the work of the nominee. The list of scholars may include, but need not be limited to, doctoral students who worked with the nominee. Current contact information for the list of scholars should also be included in the nomination.
- The nominee's CV.

Self-nominations will not be accepted.

The deadline for nominations is Friday January 24, 2018. Nominations are submitted by sending an email to the SIG Secretary, Cari Herrmann Abell, at cabell@bscs.org.

IOMW 2020: Call for Proposals

Dear colleagues,

The International Objective Measurement Workshop (IOMW) 2020 Conference will be held in Berkeley on April 14 to 16 (at the University of California, Berkeley; a 30 minute train ride from the AERA/NCME 2020 location in San Francisco), with an additional half-day of workshops on April 16 and full-day of workshops on April 17. IOMW presents an opportunity for scholars interested in the theory and practice of objective measurement in the human sciences to present research, learn about the most recent developments, and meet with colleagues who share similar interests in an intimate setting.

We have an exciting pair of keynote speakers: Dr. Neal Kingston (University of Kansas) will talk about learning maps, and Dr. Luca Mari (Università Cattaneo, Italy) will talk about foundations of measurement. There will also be several of workshops from leading experts in the subject that will cover both technical and substantive issues—some of which are: using R for latent variable modeling (led by Dr. Minjeong Jeon; University of California, Los Angeles); using BASS—the new software for data collection and analysis (by Dr. David Torres Iribarra, Catholic University of Chile and BEAR Center researcher), and workshop based on an upcoming book on the philosophy of measurement (by Dr. Luca Mari, Dr. Mark Wilson, and Dr. Andrew Maul).

The deadline for submitting proposals is **December 15, 2019**, and details about the submission of paper and symposium proposals (and conference registration) will be available at www.iomw.org. We are very interested in promoting conversations and

dialogues, and hence, we are accepting individual paper presentations to be delivered in a round-table format. We will also accept symposia proposals that encourage discussions and debate. We invite both theoretically-focused and applied papers. Examples of themes we are particularly excited about include (but not limited to):

Measurement in the information age.

Sources and types of data have expanded beyond traditional responses to fixed survey questions. With advances in technology have come dramatic increases in the size and scope of data, and in access to it. We invite papers that incorporate data from novel sources, that advance measurement methodology for such data or that reflect critically on measurement theory and practice in the era of big data.

Applications and modeling. The IOMW provides opportunities to share evolving and ongoing work relevant to the practice of objective measurement, broadly defined. We invite papers that allow you to share work (including work in progress) and get feedback from colleagues in the IOMW community. Our goal is to keep up to date with the latest advances in the application of objective measurement.

Conversations across disciplines and traditions. Objective measurement is a critical component of scientific inquiry in many areas, including but not limited to the areas of public health, the medical sciences, counseling, the biological sciences, psychology, education, economics, and sociology. Papers likely to stimulate cross-disciplinary perspectives on measurement are especially welcome.

Change over time, place, and context. On the one hand, invariance is a critical concept

in objective measurement; on the other hand, measures are often applied to highly dynamic systems (e.g., human beings) that change over time and context. This is particularly visible in contemporary debates about the assessment of learning and "growth". We welcome papers on related topics including but not limited to vertical scaling, measurement invariance (of any form), and longitudinal models.

Foundations of measurement. IOMW scholars are committed to examining foundational measurement concepts, including the conditions that maximize the validity, reliability, and utility of measures. We welcome conceptual, theoretical, historical and/or comparative papers that help us to understand better what is at stake in the development, use, and discussion of measures.

Great news for graduate student and early-career attendees: IOMW is continuing to facilitate a mentoring program that pairs early-career researchers with seasoned scholars.

Please feel free to share this announcement with colleagues. Please also feel free to reach out with questions or comments, and we look forward to seeing you in Berkeley in April!

All the best,

IOMW 2020 Conference Organizing
Committee

V-M²Ed Conference: Call for Applications for Participation

The National Science Foundation recently funded a conference entitled Validity Evidence for Measurement in Mathematics Education (V-M²Ed) to be held in Las Vegas, NV on February 20 – 21, 2020.

The V-M²Ed conference will bring together researchers (including graduate students) from different theoretical and methodological perspectives to contextualize current conceptions of validity within the field of mathematics education. We intend to spark conversations and foster collaboration across individuals and groups with an interest in validity. Conference participants may include individuals with expertise in mathematics education, psychometrics, and applied measurement (e.g., special education or educational psychology researchers), as well as individuals with interests related to measure validity (e.g., policy). The purpose of the conference is to facilitate discussion on strengthening quantitative measure quality in mathematics education, with a specific focus on validity

as it relates to tools used to measure student- and teacher-related outcomes that are useful for large-scale applications.

The aims of the V-M²Ed conference are:

- 1) Defining and contextualizing key terms identified as critical to examining validity of quantitative tools and measures, and
- 2) Creation and dissemination of a document (or set of documents) expressing ideas related to these definitions and contextualizations to the field of researchers working within mathematics education.

Stipends are available for those selected to participate. Interested individuals (including

graduate students) are encouraged to apply at the following link:

<https://forms.gle/NFhiMxPhgdjMZhi86>

Applications are due October 31, 2019. If you would like more information, please contact Jonathan Bostic (bosticj@bgsu.edu) or Erin Krupa (eekrupa@ncsu.edu).

Upcoming Rasch Measurement Courses and Workshops

November 15, 2019, Workshop in Spain: Rasch Models in Business Administration

This workshop is organized by the Instituto Universitario De La Empresa (Iude), Universidad De La Laguna, Canary Islands, Spain. Authors are invited to submit proposals via email for presentation at the workshop.

For more details, please see:

<https://www.ull.es/portal/agenda/evento/13nd-international-workshop-on-rasch-models-in-business-administration/>



Two-Part Workshop at the University of Western Australia

Part One: January 30-31, 2020

Part 1 introduces participants to the RUMM2030 software – an easy to use interactive program that provides comprehensive diagnostics in both tabular

and graphical forms. It can also be used in large-scale assessments including vertical equating.

Part Two: February 4 – 7, 2020:

Rasch models for measurement are used in large-scale national and international assessments to equate tests and to use as criteria for designing tests. This is an opportunity to study with researchers from The University of Western Australia and the University of Sydney who have made advancement in all areas of Rasch measurement - theoretical, applied, and software development. This course is based on graduate level online units that have been taught at The Psychometric Laboratory at UWA for many years and which are now integrated as the text: Andrich, D. & Marais, I. (2019). *A course in Rasch measurement theory*. Springer.

For more details, please see:

<http://www.education.uwa.edu.au/ppl/course/s/rasch-course>

List of Recent Publications in *Journal of Applied Measurement*

Vol. 20, No. 2, Summer 2019

Loevinger on Unidimensional Tests with Reference to Guttman, Rasch, and Wright - *Mark H. Stone and A. Jackson Stenner*

Standard-Setting Procedures for Counts Data - *Rianne Janssen, Jorge González, and Ernesto San Martín*

Expected Values for Category-To-Measure and Measure-To-Category

Statistics: A Simulation Study -
Eivind Kaspersen

Missing Data and the Rasch Model:
The Effects of Missing Data
Mechanisms on Item Parameter
Estimation - *Glenn Thomas*
Waterbury

Cross-Cultural Comparisons of
School Leadership using Rasch
Measurement - *Sijia Zhang and*
Stefanie A. Wind

Development of a Mathematics Self-
Efficacy Scale: A Rasch Validation
Study - *Song Boon Khing and Tay*
Eng Guan

Lucky Guess? Applying Rasch
Measurement Theory to Grade 5
South African Mathematics
Achievement Data - *Sarah Bansilal,*
Caroline Long, and Andrea Juan

A Note on the Relation between Item
Difficulty and Discrimination Index-
Xiaofeng Steven Liu

Vol. 20, No. 3, Fall 2019

Psychometric Validation of the 10-
Item USDA Food Security Scale for
Use with College Students - *Allison*
J. Ames and Tracey M. Barnett

A Validity Study Applying the
Rasch Model to the American
Association for the Advancement of
Science Force and Motion Sub-Topic
Assessment for Middle School
Students - *Kristin L. K. Koskey,*
Nidaa Makki, Wondimu Ahmed,
Nicholas G. Garafolo, Donald P.

Visco, Jr., Benjamin G. Kruggel, and
Katrina Halasa

Rasch Analysis of Catholic School
Survey Data - *Stephen M. Ponisciak*
and Monica J. Kowalski

Validating a Measure of Numeracy
Skill Use in the Workplace for
Incarcerated and Household Adults -
Emily D. Buehler and Maria
Pampaka

Using Confidence Intervals of the
Item and Test Information Functions
to Test Differential Item and Test
Functioning: Visual and Statistical
Analyses - *Georgios D. Sideridis,*
Ioannis Tsaousis, and Khaleel Al.
Harbi

Examining Parameter Estimation
when Treating Semi-Mixed
Multidimensional Constructs as
Unidimensional - *Sakine Gocer*
Sahin, Selahattin Gelbal, and Cindy
M. Walker

Dimensionality of the Russian
CORE-OM from a Rasch
Perspective - *Marina Zeldovich,*
Andrey A. Ivanov, and Rainer W.
Alexandrowicz