Advances in
Rasch Measurement
Volume 2

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Preface

This second volume in the *Advances in Rasch Measurement* series contains papers presented at the 12th and 13th International Objective Measurement Workshops held in Cairns, Queensland, Australia (2004) and Berkeley, California, USA (2006). In addition, for the first time, the collection includes submissions to the inaugural Pacific Rim Objective Measurement Symposium (2006).

One hundred sixty papers were presented at these events, organized by Trevor Bond (IOMW 2004; PROMS 2006) and Nathaniel Brown and Brent Duckor (IOMW 2006). A call for submissions for a refereed proceedings resulted in a pool of forty papers. Each paper was reviewed blind by two experts and either accepted, accepted pending minor revision, returned for revision and resubmission, or rejected. Decisions were based on significance of the topic, writing quality, literature review, research design, data analysis, discussion and conclusions, and appropriateness for this volume. Revised manuscripts were reviewed by the editorial board. Nineteen papers appear in this volume, an acceptance rate of 47%.

In accordance with the traditions established by the predecessor series *Objective Measurement: Theory into Practice* (Vols. 1-5) and carried forth by the first volume of this new series, the chapters in this volume deal with both the theoretical and practical applications of Rasch measurement.

The three papers in the first section, **Theory of Measurement**, deal with the theoretical foundations of successful objective measurement. In Chapter 1, Fisher discusses the mathematical definitions of capital, the important distinction between living and dead capital, and the role of measurement as a tool to bring human, social, and natural capital to life. In Chapter 2, Burdick, Stenner, and Kyngdon examine different multi-item models and the support they provide for reliable measurement, concluding that the Rasch model has special features in this regard. In Chapter 3, Duckor, Draney, and Wilson introduce a new theory of measurement knowledge from the perspective of a continuum of expertise, while advancing six new construct maps within the Constructing Measures framework.

The four papers in the second section, **Measurement Models**, introduce new models for various measurement purposes and new methods for exploring model fit. In Chapter 4, Linacre describes models for predict-

ing future data from existing data. In Chapter 5, Paek, Yon, Wilson, and Kang describe an extended testlet model in which there may be interaction between the testlet effect and the target dimension. In Chapter 6, Brandt describes a subdimension model that accounts for strengths or weaknesses in subdomains within an overarching unidimensional domain. In Chapter 7, Adams and Wu describe a method for creating user-defined fit tests for combinations of items that can more powerfully test hypothesized model violations.

The eight chapters in the third section, **Applications I: Unidimensional Modeling**, discuss issues arising in the application of Rasch measurement in unidimensional contexts and present several new measurement scales. In Chapter 8, Looveer and Mulligan discuss linking test forms across years in the construction of a numeracy achievement scale and the necessity of testing for the presence of differential item functioning across those years. In Chapter 9, Blais, Grondin, Loye, and Raîche discuss the detection of item wording effects on an opinion questionnaire. In Chapter 10, Gaffney, Cudeck, Ferrer, and Widaman discuss using factor analysis to analyze the dimensionality of California's high-stakes educational achievement tests. In Chapters 11-15, the development and/or validation of new measurement scales is described in the contexts of English writing on a Japanese university's entrance examination (Weaver), English proficiency of California English language learners (Sanchez), student ratings of teaching effectiveness (Mat Daud and Lide Abu Kassim), teacher grading philosophies (Randall and Engelhard), and achievement in music education (Bond and Bond).

The four chapters in the fourth section, **Applications II: Multidimensional Modeling**, discuss issues arising in the application of Rasch measurement in multidimensional contexts. In Chapters 16-19, the development and validation of new measurement scales is described in the contexts of academic engagement (Caspary and Santelices), architectural drawing (Scalise, Cheng, and Oskui), human performance (Allen), and self-efficacy belief (Liu and Wilson).

The *Advances in Rasch Measurement* series represents the work of a community of measurement experts and practitioners that is unique in its singular focus and breadth of application. We hope that Volume 2 advances and sustains our community in the 21st Century as it continues to innovate and demonstrate the relevance of Rasch measurement in a variety of contexts across the globe.