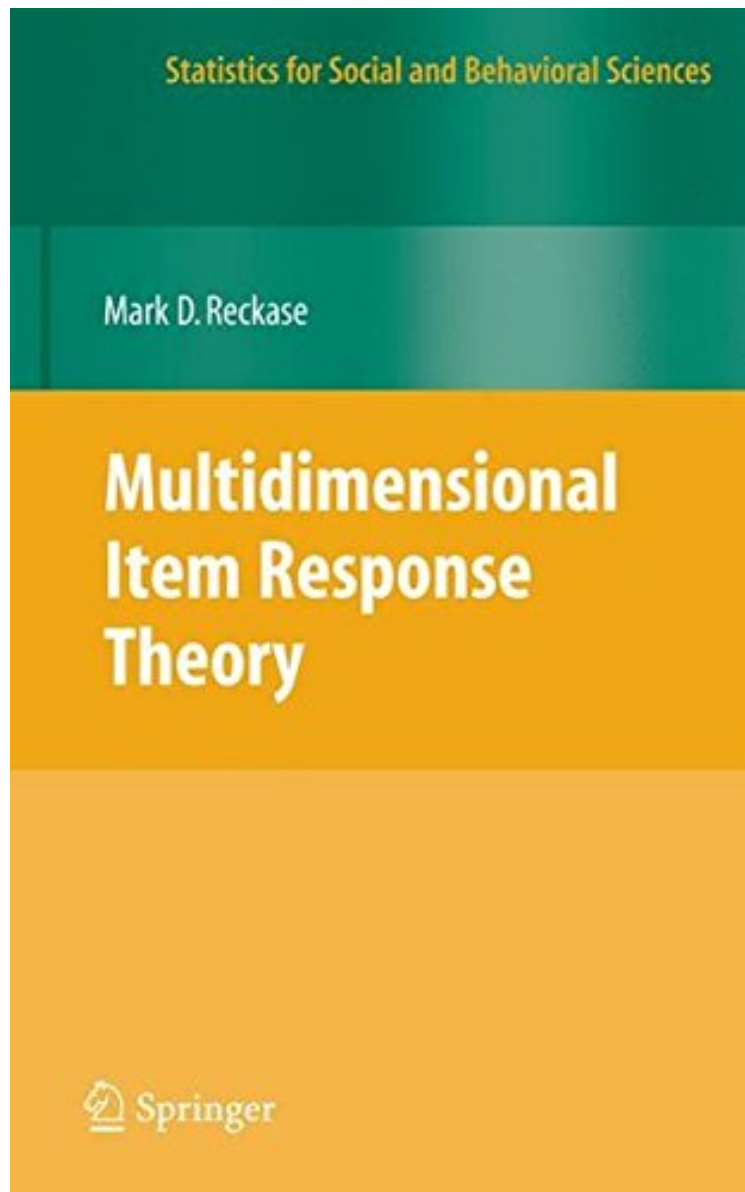


(Download pdf) Multidimensional Item Response Theory (Statistics for Social and Behavioral Sciences)

Multidimensional Item Response Theory (Statistics for Social and Behavioral Sciences)

M.D. Reckase

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M.D. Reckase : Multidimensional Item Response Theory (Statistics for Social and Behavioral Sciences) before purchasing it in order to gauge whether or not it would be worth my time, and all praised Multidimensional Item Response Theory (Statistics for Social and Behavioral Sciences):

11 of 11 people found the following review helpful. Hugely important! By Mark H. Moulton

The MIRT sub-field of psychometrics has for years labored in obscurity, due in no small part to the inability of its practitioners and students to understand each other and master each other's algorithms and models. Reckase, one of the field's leaders, takes a bold step in correcting the situation. Excellently researched, clearly written, logically presented, fair and balanced, Reckase summarizes the foundations of probabilistic unidimensional models and shows how they generalize, so that persons (test examinees) and items (test questions) can be represented as points (vectors) floating around in a multidimensional space. This is not a book for the field practitioner or the casual researcher. It does not skip over the math, and the math is hard-core. Nonetheless, it is surprisingly readable. The reader will be pleased to find himself following the gist of Reckase's explanations without difficulty, even when the mathematical details are too much. To appreciate this work, it is important to know why MIRT is important. Unfortunately, Reckase never tells us. We understand that MIRT is motivated by the fact that items and tests are complex, that they embody multiple dimensions, that therefore a multidimensional model is necessary. This hardly touches the surface. As the fantastic drama of the Netflix contest revealed (a recently resolved contest to win \$1 m. for best predicting movie ratings), we live in a world of psychological profiling and prediction, a world populated by weird and incredible mathematical models that touch on every aspect of life -- from selecting food at Safeway, to renting movies, to profiling terrorists, to guiding teacher instructional decisions, to training computers to read and understand text and recognize the spoken word. None of that is in this book. The great divide between educational psychometrics and "data mining" or "knowledge discovery" has yet to be crossed. MIRT is the subfield within educational psychometrics that will ultimately bridge that divide. On the theory side, Reckase does not conceal his differences with the "Rasch School" of psychometrics (of which I am a member) regarding the purpose of educational measurement and modeling, though he is obviously well-versed in Rasch models and presents them well, including their MIRT flavors. He sees the purpose of a model to be "descriptive" (to describe the data closely), whereas Rasch theorists see the purpose of a model to be "prescriptive" (to prescribe the conditions under which data yield true measures, i.e., measures that are most likely to reproduce across datasets regardless of person and item samples). The models that Reckase speaks about with the confidence of personal knowledge are "descriptive" in this sense. Due perhaps to his preference for descriptive models, I found there were certain questions that Reckase did not seem to spend time on, questions that are huge for me: 1. How well do MIRT models handle small sample sizes? 2. How do they handle missing data, whether randomly or non-randomly missing? 3. To what degree are the person and item parameters invariant across samples? Can I cherry-pick my samples and get different parameters? These are the sorts of questions Rasch people are always asking and where the Rasch model, properly used, has much to offer. I also found myself looking in vain for discussion of Rasch's "specific objectivity" property as relates to MIRT, often called the "invariance" property. I learned that Reckase means something else entirely by the same word. In the Rasch world, "invariance" means that item and person parameters, and the resulting response probabilities, are invariant across samples, that persons will obtain the same relative measures regardless of what items they are administered so long as the items embody the same dimension. For Reckase, "invariance" means that the origin and orientation of the coordinate system can be moved without affecting the response probabilities. It's got nothing to do with samples. So, in the end, I still don't know what, if any, invariance properties the various MIRT models discussed in the book possess, defining "invariance" in the Rasch sense as invariance across person and item samples. But those are my problems, not Reckase's. This book is a significant step forward in the maturation of an extraordinarily important, but little known, field.

0 of 0 people found the following review helpful. I learned a great deal from it. By Cannon Gray LLC

Already a classic that defines this space. I learned a great deal from it. 0 of 0 people found the following review helpful. Really good book for both unidimensional and multidimensional theories. By ppires85

Really good book for both unidimensional and multidimensional theories. Reckase really gives a very nice look into the models in a language that is adequate and accessible.

First thorough treatment of multidimensional item response theory Description of methods is supported by numerous practical examples Describes procedures for multidimensional computerized adaptive testing

From the reviews: This book is the result of the authors many years of work in multidimensional item response theory (MIRT) work that builds on the foundations laid by item response theory (IRT) and factor analysis pioneers. In summary this book seeks to present a complex topic in a readable fashion . helpful to many IRT researchers especially to young researchers who will further develop theory and apply MIRT in their research not only in psychology but in other areas of science. (Fumiko Samfjima, Journal of the American Statistical Association, Vol. 106 (493), March, 2011) This book gives a comprehensive review of theories and applications in various aspects of Multidimensional Item Response Theory (MIRT). Every chapter is self-contained and starts with well-explained background information. In all, this book is an inspiring book in measurement and, more importantly, there is no other comparable text on the topic. this book will remain a key resource (handbook and textbook) for many years to come, and we highly recommend the book to teachers, students and researchers who are interested in IRT. (Hua-Hua Chang and Chun Wang, Psychometrika, Vol. 76 (3), July, 2011) From the Back Cover Multidimensional Item Response Theory is

the first book to give thorough coverage to this emerging area of psychometrics. The book describes the commonly used multidimensional item response theory (MIRT) models and the important methods needed for their practical application. These methods include ways to determine the number of dimensions required to adequately model data, procedures for estimating model parameters, ways to define the space for a MIRT model, and procedures for transforming calibrations from different samples to put them in the same space. A full chapter is devoted to methods for multidimensional computerized adaptive testing. The text is appropriate for an advanced course in psychometric theory or as a reference work for those interested in applying MIRT methodology. A working knowledge of unidimensional item response theory and matrix algebra is assumed. Knowledge of factor analysis is also helpful. Mark D. Reckase is a professor of Measurement and Quantitative Methods in the College of Education at Michigan State University. He has been president of the National Council of Measurement in Education, Vice President of Division D of the American Educational Research Association, on the Board of Trustees of the Psychometric Society, and the editor of *Applied Psychological Measurement* and the *Journal of Educational Measurement*. He has been doing research in the area of MIRT since 1972.