
Preface

This volume gathers together a set of extensions of the Rasch model, one of the most prominent models for measurement in educational research and social science developed by Danish mathematician Georg Rasch. The idea for this volume emerged during a meeting of the Psychometric Society in Monterey, CA. At that meeting, friends and colleagues discussed news about the impending retirement of Dr. Jürgen Rost, an important innovator and mentor in this field. To recognize Jürgen's contributions, we decided to produce a collection of research on extending the Rasch model as well as embedding the Rasch model in more complex statistical models, an area that is receiving broad interest in many fields of social sciences at the current time.

This collection contains 22 chapters by recognized international experts in the field. The contributions cover topics ranging from general model extensions to application in fields as diverse as cognition, personality, organizational and sports psychology, and health sciences and education.

The Rasch model is designed for categorical data, often collected as examinees' responses to multiple tasks such as cognitive items from psychological tests or from educational assessments. The Rasch model's elegant mathematical form is suitable for extensions that allow for greater flexibility in handling complex samples of examinees and collections of tasks from different domains. In these extensions, the Rasch model is enhanced by additional structural elements that account either for differences between diverse populations or for differences among observed variables.

Research on extending well-known statistical tools such as regression, mixture distribution, and hierarchical linear models has led to the adoption of Rasch model features to handle categorical observed variables. We maintain both perspectives in the volume and show how these merged models—Rasch models with a more complex item or population structure—are derived either from the Rasch model or from a structural model, how they are estimated, and where they are applied.

This volume is centered on extensions of the Rasch model to multiple dimensions and complex samples of examinees and/or item responses. Therefore,

applications of the unidimensional Rasch model for simple random samples are not specifically mentioned. Such cases can be found in volumes geared toward applying the Rasch model. More importantly, simple data collection designs can be treated as special cases of the extensions presented here, so that data suitable for the ordinary Rasch model can be analyzed with virtually all the extensions presented in this volume.

Thanks goes to our respective families, who helped us a lot with their encouragement and support: thank you Alina, Barbara, Thomas, and Luis! We are also deeply grateful to our academic teacher, Jürgen Rost, who introduced us to the fascinating field of extended Rasch models. We would also like to thank our professional affiliations and colleagues for making this project possible by providing resources and support. We thank Daniel Eignor for the excellent help on clarifying and better organizing a lot of our writing, and thanks go to Kim Fryer for the superb editorial support and to Henning Voigtländer for helping to convert and typeset many contributed chapters. Most of all, the diversity and coverage of topics presented in this volume would not have been possible without the excellent contributors in their roles as authors and reviewers for this volume.

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