

Quantitative Data Analysis for Language Assessment

Volume II

Advanced Methods

**Edited by Vahid Aryadoust
and Michelle Raquel**

Table of contents

<i>List of figures</i>	vii
<i>List of tables</i>	ix
<i>List of volume II contributors</i>	xi
<i>Preface</i>	xv
Introduction	1
VAHID ARYADOUST AND MICHELLE RAQUEL	
SECTION I	
Advanced item response theory (IRT) models in language assessment	13
1 Applying the mixed Rasch model in assessing reading comprehension	15
PURYA BAGHAEI, CHRISTOPH J. KEMPER, MONIQUE REICHERT, AND SAMUEL GREIFF	
2 Multidimensional Rasch models in first language listening tests	33
CHRISTIAN SPODEN AND JENS FLEISCHER	
3 The log-linear cognitive diagnosis modeling (LCDM) in second language listening assessment	56
TUĞBA ELIF TOPRAK, VAHID ARYADOUST, AND CHRISTINE GOH	
4 Application of a hierarchical diagnostic classification model in assessing reading comprehension	79
HAMDOLLAH RAVAND	

SECTION II	
Advanced statistical methods in language assessment	99
5 Structural equation modeling to predict performance in English proficiency tests	101
XUELIAN ZHU, MICHELLE RAQUEL, AND VAHID ARYADOUST	
6 Student growth percentiles in the formative assessment of English language proficiency	127
HUSEIN TAHERBHAI AND DAERYONG SEO	
7 Multilevel modeling to examine sources of variability in second language test scores	150
YO IN'NAMI AND KHALED BARKAOUI	
8 Longitudinal multilevel modeling to examine changes in second language test scores	171
KHALED BARKAOUI AND YO IN'NAMI	
SECTION III	
Nature-inspired data-mining methods in language assessment	191
9 Classification and regression trees in predicting listening item difficulty	193
VAHID ARYADOUST AND CHRISTINE GOH	
10 Evolutionary algorithm-based symbolic regression to determine the relationship of reading and lexicogrammatical knowledge	215
VAHID ARYADOUST	
<i>Index</i>	234