

CONTENTS

Preface	xiii
1 Introduction: Individual Differences and Psychometrics	1
Individual Differences, Assessment and Psychometric Testing	2
<i>Why Measure Individual Differences?</i>	2
<i>Identifying and Measuring Differences</i>	7
<i>What Do We Mean by Psychological Assessment and Psychometrics?</i>	9
<i>The Historical Background</i>	15
Core Characteristics of Assessment	20
<i>The Technical Nature of Assessment</i>	21
<i>Stable and Changing Characteristics</i>	24
Types of Measurement	26
<i>Maximum Performance Measures</i>	26
<i>Typical Performance Measures</i>	27
<i>Other Ways of Classifying Tests</i>	28
<i>Different Approaches to Testing</i>	28
<i>Quality and Measurement</i>	30
<i>What Are Tests Used For?</i>	31
What Have We Discovered About Individual Differences and Psychometrics?	32
Some Key Questions	33
Part I: The Essential Tools of Psychological Measurement	35
2 The Basic Components: Scales and Items	37
What Kinds of Scales Are Available?	38
<i>Nominal Scales</i>	39
<i>Ordinal Scales</i>	39
<i>Scalar Variables</i>	40
Construction and Analysis of Items	43
<i>Intelligence Test Items</i>	43
<i>Performance Tests</i>	44
<i>Ability and Aptitude Tests</i>	44
<i>Person-based and Personality Questionnaires</i>	44
<i>Items Having Rating Scales</i>	46
<i>Forced-Choice Items</i>	47
Item Analysis	48
<i>Classical Item Analysis</i>	49

<i>Item Response Theory</i>	54
<i>Comparing Classical Test Theory and Item Response Theory</i>	58
Measuring Attitudes	59
<i>Attitude Measurement</i>	60
<i>Thurstone's Scales</i>	60
<i>Likert Scales</i>	61
<i>Guttman's Scalogram</i>	62
<i>The Semantic Differential</i>	63
<i>Limitations of Attitude Measures</i>	64
What Have We Discovered About the Basic Components of Assessment?	65
Some Key Questions	66
3 How Assessment Measures are Made	67
Planning and Designing New Tests	68
Methods of Test Construction	70
<i>Criterion-Keyed Construction</i>	70
<i>Construction Using Factor Analysis</i>	72
<i>Construction Using Classical Test Theory</i>	75
<i>Construction Using Item Response Theory and Rasch Scaling</i>	76
To Standardize or Not to Standardize?	77
<i>Standardized Measures</i>	77
<i>Sampling</i>	77
<i>Norm Referencing</i>	80
<i>Criterion Referencing</i>	83
<i>Self Referencing</i>	84
<i>Domain Referencing</i>	85
How Are Percentile Norms Made?	86
<i>Calculation from Raw Scores</i>	87
<i>Interpreting Percentiles</i>	91
What Have We Discovered About How Assessment Measures Are Made?	92
Some Key Questions	93
4 Statistics for Psychological Measurement	94
Frequency Distributions	95
<i>The Normal Curve</i>	98
<i>Skewed Distributions</i>	101
Measures of Central Tendency	105
<i>The Normal Curve and Probability</i>	108
Sampling and Standard Error of the Mean	110
<i>Sampling Error</i>	110
<i>The Standard Error of the Mean</i>	111
<i>Confidence Limits</i>	111

The Normal Curve and Standard Scores	115
<i>Z Scores</i>	115
<i>Normalizing Scores</i>	117
<i>T Scores</i>	118
<i>Sten Scores</i>	118
<i>Stanine Scores</i>	119
<i>Converting Raw Scores to Standard Scores</i>	119
<i>Standard Scores in Practice</i>	120
What Have We Discovered About the Statistics Which Underpin Psychological Assessment?	122
Some Key Questions	122

PART II: The Essential Characteristics of Psychological Measurement **125**

5 The Importance of Reliability	127
Why Reliability?	127
<i>Consistency and Accuracy</i>	127
The Concept of Correlation	129
<i>Scattergrams</i>	129
<i>Covariance</i>	132
<i>Correlation Coefficients</i>	132
Identifying and Evaluating Error	135
<i>The Fallibility of Scores</i>	135
<i>Sources of Error</i>	135
Different Types of Reliability	137
<i>Evaluation of Coefficients</i>	141
<i>Generalizability Theory</i>	143
Measuring Error and Making Decisions	145
<i>Connecting SEM and Reliability</i>	148
<i>Effects of Range Restriction</i>	149
<i>SEM and Standard Scale Scores</i>	151
<i>Using Confidence Limits</i>	151
<i>Standard Error of Difference</i>	153
<i>Comparing and Combining Scores</i>	155
What Have We Discovered About Reliability?	161
Some Key Questions	162
 6 The Significance of Validity	 163
Why Validity?	163
<i>Defining Validity</i>	164
<i>What Does Validation Mean?</i>	165
<i>Criterion Variables</i>	166

A Catalogue of Validity	167
<i>Content Validity</i>	168
<i>Criterion-Related Validity</i>	169
<i>Construct Validity</i>	172
<i>The Multitrait-Multimethod Approach</i>	174
Validation in Practice	175
<i>Giving Evidence</i>	175
<i>Validity's 'Faux Amis' (False Friends)</i>	176
<i>Evaluating Validity Coefficients</i>	178
<i>Factors Affecting Coefficients</i>	178
Meta-Analysis	181
What Have We Discovered About Validity?	182
Some Key Questions	182

PART III: Theories and Applications of Measurement Techniques **183**

7 Theories and Measurement of Intellectual Ability	185
Psychology's World Cup Winner: Intelligence	186
<i>What is Intelligence?</i>	186
<i>Implicit and Explicit Theories</i>	186
An Intelligent History	188
<i>Fluid and Crystallized Intelligence</i>	189
<i>Guilford's Structure of Intellect</i>	190
<i>Vernon's Hierarchy</i>	190
<i>An Integrative Model</i>	191
<i>The Theory of Cognitive Abilities</i>	192
<i>Gardner and Sternberg</i>	193
<i>A Cognitive Psychology Model</i>	194
The Development of Intelligence Testing	195
<i>Early Days</i>	196
<i>The Stanford-Binet</i>	197
<i>Alpha and Beta Tests</i>	198
<i>Wechsler Scales</i>	199
<i>The Problem of Culture</i>	204
<i>Later Test Developments</i>	205
Issues About Intelligence	208
<i>The Nature-Nurture Debate</i>	208
<i>Ideology and Intelligence</i>	210
<i>The Flynn Effect</i>	212
Measurement of Abilities and Aptitudes	213
<i>Specific Versus General Measures</i>	217
<i>Utility Analysis</i>	218
What Have We Discovered About the Theories and Measurement of Intellectual Ability?	223
Some Key Questions	223

8 Theories and Measurement of Personality Characteristics	224
The Concept of Personality	225
<i>Situational and Dispositional Approaches</i>	228
<i>How Do We Define Personality?</i>	229
<i>Making Important Distinctions</i>	230
Theories of Personality	232
<i>Types, Traits and Competencies</i>	233
<i>Idiographic versus Nomothetic Approaches</i>	235
<i>The Physiological Paradigm</i>	237
<i>The Psychodynamic Paradigm</i>	239
<i>The Cognitive-Behavioural Paradigm</i>	242
<i>The Phenomenological Paradigm</i>	243
<i>The Biological Paradigm</i>	249
<i>The Trait Paradigm</i>	251
Personality Questionnaires: Advantages and Limitations	259
<i>Correlational Approaches to Validation</i>	261
What Have We Discovered About the Assessment and Measurement of Personality?	263
Some Key Questions	264
9 Alternative Perspectives: Theories and Measurement	265
Alternative Approaches to Assessment	265
<i>Attribution Processes</i>	266
<i>Spurious Validity</i>	267
<i>Graphology</i>	268
<i>Polygraphy</i>	269
<i>Other Pseudo-sciences</i>	269
More Accepted Forms of Assessment	271
<i>Situational Assessments</i>	271
<i>Reports by Others</i>	273
<i>Projective Instruments</i>	274
<i>Observations of Behaviour</i>	275
<i>Self-Report Assessments</i>	278
<i>Task Performance Measures</i>	279
<i>Physiological Measures</i>	279
<i>Objective Tests</i>	280
<i>Honesty and Integrity Questionnaires</i>	281
Measuring Motives, Values, Interests and Creativity	282
<i>Measuring Motives</i>	282
<i>Measuring Values</i>	285
<i>Measuring Interests</i>	286
<i>Measuring Creativity</i>	289
What Have We Discovered About Alternative Perspectives on Assessment?	293
Some Key Questions	294

Part IV: Ethical and Professional Issues	295
10 Best Practice in Measurement	297
Ethics, Fairness and Assessment	298
<i>Fairness in Testing</i>	300
<i>Data Protection</i>	307
<i>Confidentiality and Security</i>	308
<i>Informed Consent</i>	310
Professional Issues in Testing	312
<i>Job Analysis</i>	312
<i>Test Administration</i>	316
<i>Scoring Tests</i>	320
<i>Interpretation</i>	321
<i>Giving Feedback</i>	323
<i>Testing in the Twenty-first Century</i>	329
What Have We Discovered About Best Practice in Measurement?	331
Some Key Questions	332
Part V: Practical Skills for Measurement of Individual Differences	333
11 How to Make a Test or Questionnaire	335
Constructing Your Measure	336
<i>Step 1: Set Clear Aims</i>	336
<i>Step 2: Define the Attribute(s)</i>	336
<i>Step 3: Write a Plan</i>	337
<i>Step 4: Writing Items</i>	339
<i>Step 5: Selecting Items</i>	340
<i>Step 6: Standardization</i>	343
<i>Step 7: Final Preparation</i>	343
Appendix A: A Table of Areas Under the Normal Curve	344
References	346
Author Index	372
Subject Index	377
Assessment, Measures and Tests Index	381