

# PSYCHOLOGICAL TESTING AND ASSESSMENT

An Introduction to Tests & Measurement

RONALD JAY COHEN

MARK E. SWERDLIK

# **Contents**

Preface xiii

# PART | An Overview

4	Peychological	Taction an	d Assessment	1
	PSVGHUHUHGAL	Testilla all	in 4226221116111	- 1

TESTING AND ASSESSMENT 1

Psychological Testing and Assessment Defined 1
THE TOOLS OF PSYCHOLOGICAL ASSESSMENT 5

The Test 5

The Interview 7

The Portfolio 9

Case History Data 10

\*Behavioral Observation 10

Role-Play Tests 11

Computers as Tools 12

Other Tools 14

WHO, WHAT, WHY, HOW, AND WHERE? 15

Who Are the Parties? 15

In What Types of Settings Are Assessments Conducted, and Why? 20

How Are Assessments Conducted? 24

Where to Go for Authoritative Information: Reference Sources 31

MEET AN ASSESSMENT PROFESSIONAL Meet Dr. Barbara C. Pavlo 17

CLOSE-UP Should Observers Be Parties to the Assessment Process? 18

EVERYDAY PSYCHOMETRICS Everyday Accommodations 29

SELF-ASSESSMENT 34

## 2 Historical, Cultural, and Legal/Ethical Considerations 35

A HISTORICAL PERSPECTIVE 35

Antiquity to the Nineteenth Century 35

The Twentieth Century 39

CULTURE AND ASSESSMENT 42

Evolving Interest in Culture-Related Issues 42

Some Issues Regarding Culture and Assessment 47

Tests and Group Membership 51

LEGAL AND ETHICAL CONSIDERATIONS 53

The Concerns of the Public 54

The Concerns of the Profession 61

The Rights of Testtakers 66

CLOSE-UP The Controversial Career of Henry Herbert Goddard 44
MEET AN ASSESSMENT PROFESSIONAL Meet Dr. Diana D. Jeffery 50
EVERYDAY PSYCHOMETRICS Life-or-Death Psychological Assessment 64
SELF-ASSESSMENT 70

# PART II The Science of Psychological Measurement

#### 3 A Statistics Refresher 71

SCALES OF MEASUREMENT 72

Nominal Scales 74

Ordinal Scales 74

Interval Scales 75

Ratio Scales 76

Measurement Scales in Psychology 76

DESCRIBING DATA 77

Frequency Distributions 78

Measures of Central Tendency 80

Measures of Variability 87

Skewness 91

Kurtosis 92

THE NORMAL CURVE 93

The Area under the Normal Curve 93

STANDARD SCORES 96

z Scores 96

T Scores 97

Other Standard Scores 97

MEET AN ASSESSMENT PROFESSIONAL Meet Dr. Jeff Laurent 72
EVERYDAY PSYCHOMETRICS Consumer (of Graphed Data), Beware! 83

CLOSE-UP The Normal Curve and Psychological Tests 94

SELF-ASSESSMENT 100

# 4 Of Tests and Testing 101

SOME ASSUMPTIONS ABOUT PSYCHOLOGICAL TESTING AND ASSESSMENT 101

Assumption 1: Psychological Traits and States Exist 101

Assumption 2: Psychological Traits and States Can Be Quantified and Measured 103

Assumption 3: Test-Related Behavior Predicts Non-Test-Related Behavior 104

Assumption 4: Tests and Other Measurement Techniques Have Strengths and Weaknesses 105

Assumption 5: Various Sources of Error Are Part of the Assessment Process 105

Assumption 6: Testing and Assessment Can Be Conducted in a Fair and Unbiased Manner 106

Assumption 7: Testing and Assessment Benefit Society 106

WHAT'S A "GOOD TEST"? 107

Reliability 107

Validity 108

Other Considerations 108

NORMS 111

Sampling to Develop Norms 112

Types of Norms 118

Fixed Reference Group Scoring Systems 121

Norm-Referenced versus Criterion-Referenced Evaluation 122

CORRELATION AND INFERENCE 124

The Concept of Correlation 124

The Pearson r 126

The Spearman Rho 128

Graphic Representations of Correlation 129

Regression 133

INFERENCE FROM MEASUREMENT 136

Meta-Analysis 137

Culture and Inference 137

EVERYDAY PSYCHOMETRICS Putting Tests to the Test 109

CLOSE-UP How "Standard" is Standard in Measurement? 113

MEET AN ASSESSMENT PROFESSIONAL Meet Dr. Steve Julius and

Dr. Howard Atlas 136

SELF-ASSESSMENT 138

## 5 Reliability 139

THE CONCEPT OF RELIABILITY 139

Sources of Error Variance 140

RELIABILITY ESTIMATES 143

Test-Retest Reliability Estimates 143

Parallel-Forms and Alternate-Forms Reliability Estimates 144

Split-Half Reliability Estimates 145

Other Methods of Estimating Internal Consistency 147

Measures of Inter-Scorer Reliability 150

USING AND INTERPRETING A COEFFICIENT OF RELIABILITY 151

The Purpose of the Reliability Coefficient 151

The Nature of the Test 152

Alternatives to the True Score Model 155

RELIABILITY AND INDIVIDUAL SCORES 160

The Standard Error of Measurement 160

The Standard Error of the Difference between Two Scores 168

EVERYDAY PSYCHOMETRICS The Reliability Defense and the Breathalyzer Test 156

CLOSE-UP Item Response Theory (IRT) 161

MEET AN ASSESSMENT PROFESSIONAL Meet Dr. Bryce B. Reeve 165

SELF-ASSESSMENT 171

## 6 Validity 172

THE CONCEPT OF VALIDITY 172

Face Validity 174

Content Validity 176

CRITERION-RELATED VALIDITY 180

What Is a Criterion? 181

Concurrent Validity 182

Predictive Validity 182

CONSTRUCT VALIDITY 193

Evidence of Construct Validity 194

VALIDITY, BIAS, AND FAIRNESS 199

Test Bias 199

Test Fairness 203

MEET AN ASSESSMENT PROFESSIONAL Meet Dr. Adam Shoemaker 175

CLOSE-UP Base Rates and Predictive Validity 191

EVERYDAY PSYCHOMETRICS Adjustment of Test Scores by Group Membership:

Fairness in Testing or Foul Play? 205

SELF-ASSESSMENT 207

# 7 Utility 208

WHAT IS UTILITY? 209

Factors That Affect Test Utility 209

UTILITY ANALYSIS 215

What Is a Utility Analysis? 215

How Is a Utility Analysis Conducted? 216

Some Practical Considerations 224

METHODS FOR SETTING CUT SCORES 227

The Angoff Method 229

The Known Groups Method 229

IRT-Based Methods 230

Other Methods 231

EVERYDAY PSYCHOMETRICS Rethinking the "Costs" of Testing—and of Not Testing 211

MEET AN ASSESSMENT PROFESSIONAL Meet Dr. Erik Viirre 213

CLOSE-UP Utility Analysis: An Illustration 217

SELF-ASSESSMENT 232

# 8 Test Development 233

TEST CONCEPTUALIZATION 233

Some Preliminary Questions 234

Pilot Work 236

TEST CONSTRUCTION 237

Scaling 237

Writing Items 244

Scoring Items 253

TEST TRYOUT 254

What Is a Good Item? 254

ITEM ANALYSIS 255

The Item-Difficulty Index 255

The Item-Reliability Index 256

The Item-Validity Index 257

The Item-Discrimination Index 258

Item-Characteristic Curves 260

Other Considerations in Item Analysis 263

Qualitative Item Analysis 265

TEST REVISION 267

Test Revision as a Stage in New Test Development 268

Test Revision in the Life Cycle of an Existing Test 269

The Use of IRT in Building and Revising Tests 273

EVERYDAY PSYCHOMETRICS Psychometrics in the Classroom 238

CLOSE-UP Designing an Item Bank 250

MEET AN ASSESSMENT PROFESSIONAL Meet Dr. Scott Birkeland 261

SELF-ASSESSMENT 275

# The Assessment of Intelligence

## 9 Intelligence and Its Measurement 277

WHAT IS INTELLIGENCE? 277

Intelligence Defined: Views of the Lay Public 278

Intelligence Defined: Views of Scholars and Test Professionals 279

Factor-Analytic Theories of Intelligence 283

The Information-Processing View 288

MEASURING INTELLIGENCE 289

Types of Tasks Used in Intelligence Tests 289

Theory in Intelligence Test Development and Interpretation 291

INTELLIGENCE: SOME ISSUES 292

Nature versus Nurture 292

The Stability of Intelligence 295

The Construct Validity of Tests of Intelligence 297

Other Issues 299

A PERSPECTIVE 308

MEET AN ASSESSMENT PROFESSIONAL Meet John Garruto, M.S. 286

EVERYDAY PSYCHOMETRICS Being Gifted 298

CLOSE-UP Culture Fair, Culture Loaded 306

SELF-ASSESSMENT 309

# 10 Tests of Intelligence 310

THE STANFORD-BINET INTELLIGENCE SCALES 311

The Stanford-Binet Intelligence Scales: Fifth Edition 314

#### THE WECHSLER TESTS 319

The Wechsler Adult Intelligence Scale-Fourth Edition (WAIS-IV) 321

The Wechsler Intelligence Scale for Children-Fourth

Edition (WISC-IV) 325

The Wechsler Preschool and Primary Scale of Intelligence-Third Edition (WPPSI-III) 327

Wechsler, Binet, and the Short Form 330

The Wechsler Tests in Perspective 331

#### OTHER MEASURES OF INTELLIGENCE 335

Tests Designed for Individual Administration 335

Tests Designed for Group Administration 336

Measures of Specific Intellectual Abilities 341

CLOSE-UP Factor Analysis 332

EVERYDAY PSYCHOMETRICS The Armed Services Vocational Aptitude Battery (ASVAB):

A Test You Can Take 338

MEET AN ASSESSMENT PROFESSIONAL Meet Dr. Rivka Olley 343

SELF-ASSESSMENT 344

#### 11 Preschool and Educational Assessment 345

PRESCHOOL ASSESSMENT 345

Tools of Preschool Assessment 346

ACHIEVEMENT TESTS 351

Measures of General Achievement 352

Measures of Achievement in Specific Subject Areas 353

APTITUDE TESTS 357

The Elementary-School Level 359

The Secondary-School Level 360

The College Level and Beyond 361

Dynamic Assessment 363

DIAGNOSTIC TESTS 366

Reading Tests 366

Math Tests 367

Other Diagnostic Tests 368

#### PSYCHOEDUCATIONAL TEST BATTERIES 368

The Kaufman Assessment Battery for Children (K-ABC), and the Kaufman Assessment Battery for Children, Second Edition (KABC-II) 368

The Woodcock-Johnson III (WJ III) 371

OTHER TOOLS OF ASSESSMENT IN EDUCATIONAL SETTINGS 373

Performance, Portfolio, and Authentic Assessment 373

Peer Appraisal Techniques 375

Measuring Study Habits, Interests, and Attitudes 376

EVERYDAY PSYCHOMETRICS First Impressions 347

MEET AN ASSESSMENT PROFESSIONAL Meet Dr. Rebecca Anderson 353

CLOSE-UP Tests of Minimum Competency 355

SELF-ASSESSMENT 377

# PART W The Assessment of Personality

## 12 Personality Assessment: An Overview 378

PERSONALITY AND PERSONALITY ASSESSMENT DEFINED 378

Personality 378

Personality Assessment 379

Traits, Types, and States 379

PERSONALITY ASSESSMENT: SOME BASIC QUESTIONS 383

Who? 385

What? 389

Where? 391

How? 391

DEVELOPING INSTRUMENTS TO ASSESS PERSONALITY 400

Logic and Reason 401

Theory 401

Data Reduction Methods 402

Criterion Groups 404

PERSONALITY ASSESSMENT AND CULTURE 418

Acculturation and Related Considerations 419
MEET AN ASSESSMENT PROFESSIONAL Meet Dr. Eric Zillmer 392
EVERYDAY PSYCHOMETRICS Some Common Item Formats 396
CLOSE-UP Assessing Acculturation and Related Variables 421

SELF-ASSESSMENT 423

# 13 Personality Assessment Methods 424

OBJECTIVE METHODS 424

PROJECTIVE METHODS 426

Inkblots as Projective Stimuli 427

Pictures as Projective Stimuli 432

Words as Projective Stimuli 440

Sounds as Projective Stimuli 443

The Production of Figure Drawings 444

Projective Methods in Perspective 448

BEHAVIORAL ASSESSMENT METHODS 452

The Who, What, When, Where, Why, and How of It 454

Approaches to Behavioral Assessment 457

Issues in Behavioral Assessment 464

A PERSPECTIVE 467

MEET AN ASSESSMENT PROFESSIONAL Meet Dr. Tonia Caselman 448

EVERYDAY PSYCHOMETRICS Confessions of a Behavior Rater 458

CLOSE-UP Personality, Life Outcomes, and College Yearbook Photos 465

SELF-ASSESSMENT 468

# PART V Testing and Assessment in Action

## 14 Clinical and Counseling Assessment 469

#### AN OVERVIEW 469

The Diagnosis of Mental Disorders 471

The Interview in Clinical Assessment 473

Case History Data 479

Psychological Tests 480

#### CULTURALLY INFORMED PSYCHOLOGICAL ASSESSMENT 482

Cultural Aspects of the Interview 486

Cultural Considerations and Managed Care 487

#### SPECIAL APPLICATIONS OF CLINICAL MEASURES 488

The Assessment of Addiction and Substance Abuse 488

Forensic Psychological Assessment 490

Custody Evaluations 498

Child Abuse and Neglect 502

#### THE PSYCHOLOGICAL REPORT 505

The Barnum Effect 506

Clinical versus Mechanical Prediction 508

MEET AN ASSESSMENT PROFESSIONAL Meet Dr. Alan Raphael 481

CLOSE-UP Assessment of Dangerousness and the Secret Service 493

EVERYDAY PSYCHOMETRICS Elements of a Typical Report of

Psychological Assessment 507

SELF-ASSESSMENT 510

## 15 Neuropsychological Assessment 512

#### THE NERVOUS SYSTEM AND BEHAVIOR 512

Neurological Damage and the Concept of Organicity 513

#### THE NEUROPSYCHOLOGICAL EXAMINATION 517

History Taking, the Case History, and Case Studies 519

The Interview 521

The Physical Examination 522

Neuropsychological Tests 524

Tests of General Intellectual Ability 524

Tests to Measure the Ability to Abstract 525

Tests of Executive Function 526

Tests of Perceptual, Motor, and Perceptual-Motor Function 530

Tests of Verbal Functioning 533

Tests of Memory 534

Neuropsychological Test Batteries 538

Other Tools of Neuropsychological Assessment 543

MEET AN ASSESSMENT PROFESSIONAL Meet Dr. Kathleen Salomone 513

CLOSE-UP Fixed versus Flexible Neuropsychological Test

Batteries and the Law 539

EVERYDAY PSYCHOMETRICS Medical Diagnostic Aids and Neuropsychological Assessment 542

SELF-ASSESSMENT 544

## 16 Assessment, Careers, and Business 545

#### CAREER CHOICE AND CAREER TRANSITION 545

Measures of Interest 546

Measures of Ability and Aptitude 548

Measures of Personality 555

Other Measures 558

#### SCREENING, SELECTION, CLASSIFICATION, AND PLACEMENT 560

The Résumé and the Letter of Application 561

The Application Form 561

Letters of Recommendation 562

Interviews 563

Portfolio Assessment 563

Performance Tests 563

Physical Tests 567

# PRODUCTIVITY, MOTIVATION, ATTITUDE, AND ORGANIZATIONAL CULTURE 570

Measures of Cognitive Ability 570

Productivity 571

Motivation 575

Attitude 577

Organizational Culture 578

#### OTHER APPLICATIONS OF TOOLS OF ASSESSMENT 581

Consumer Psychology 581

The Measurement of Attitudes 582

Surveys 584

Motivation Research Methods 586

CLOSE-UP Validity Generalization and the GATB 552

MEET AN ASSESSMENT PROFESSIONAL Meet Robert B. Kaiser, M.S. 573

EVERYDAY PSYCHOMETRICS Assessment of Corporate and Organizational Culture 580 SELF-ASSESSMENT 591

References R-1

Credits C-1

Name Index N-1

Glossary/Index I-1