Chapter 9: Intelligence and Psychological Testing
Principle Types of Psychological Tests

- Mental ability tests
  - Intelligence – general
  - Aptitude – specific
- Personality scales
  - Measure motives, interests, values, and attitudes
Key Concepts in Psychological Testing

- **Standardization**
  - Test norms
  - Standardization group

- **Reliability**
  - Correlation coefficient

- **Validity**
  - Content validity
  - Criterion-related validity
  - Construct validity
Figure 9.2  Test-retest reliability
Figure 9.3  Correlation and reliability
Figure 9.4  Criterion-related validity
Figure 9.5 Construct validity

Expression Scale of PSI (Extraversion)

- Social introversion (MMPI) with -.62
- Social discomfort (PSI) with -.25
- Neuroticism (MMPI) with -.44
- Responsibility (CPI) with .04
- Tolerance (CPI) with .01
- Intelligence (Wonderlic IQ) with -.03
- Sociability (CPI) with .41
- Self-acceptance (CPI) with .39
- Extraversion (MPI) with .72

CPI = California Psychological Inventory
MMPI = Minnesota Multiphasic Personality Inventory
MPI = Maudsley Personality Inventory
PSI = Psychological Screening Inventory

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The Evolution of Intelligence Testing

• Sir Francis Galton (1869)
  – *Hereditary Genius*

• Alfred Binet and Theodore Simon (1905)
  – Binet-Simon Intelligence Scale
  – Mental age

• Lewis Terman (1916)
  – Stanford-Binet Intelligence Scale
  – Intelligence Quotient (IQ) = MA/CA x 100

• David Wechsler (1955)
  – Wechsler Adult Intelligence Scale
Figure 9.7 The normal distribution
Reliability and Validity of IQ tests

• Exceptionally reliable – correlations into the .90s
• Qualified validity – valid indicators of academic/verbal intelligence, not intelligence in a truly general sense
  – Correlations:
    – .40s–.50s with school success
    – .60s–.80s with number of years in school
• Predictive of occupational attainment, debate about predictiveness of performance
Extremes of Intelligence: Mental Retardation

- Diagnosis based on **IQ and adaptive testing**
  - IQ 2 or more SD below mean
  - Adaptive skill deficits
  - Origination before age 18
- 4 levels: mild, moderate, severe, profound
  - Mild most common by far
- Causes:
  - Environmental vs. biological
Figure 9.10 The prevalence and severity of mental retardation
Figure 9.11 Social class and mental retardation
Extremes of Intelligence: Giftedness

- **Identification issues** – ideals vs. practice
  - IQ 2 SD above mean standard
  - Creativity, leadership, special talent?
- **Stereotypes** – weak, socially inept, emotionally troubled
  - Lewis Terman (1925) – largely contradicted stereotypes
  - Ellen Winner (1997) – moderately vs. profoundly gifted
Extremes of Intelligence: Giftedness

- Giftedness and high achievement – beyond IQ
  - Renzulli (2002) – intersection of three factors
  - Simonton (2001) – drudge theory and inborn talent
Intelligence: Heredity or Environment?

• **Heredity**
  – Family and twin studies
  – Heritability estimates

• **Environment**
  – Adoption studies
  – Cumulative deprivation hypothesis
  – The Flynn effect

• **Interaction**
  – The concept of the reaction range
Figure 9.13  Studies of IQ similarity
Figure 9.14  The concept of heritability
Figure 9.16 Reaction range

- Inherited reaction range
- Measured IQ, as shaped by interaction of heredity and environment
Cultural Differences in IQ

• **Heritability** as an Explanation
  – Aurthur Jensen (1969)
  – Herrnstein and Murray (1994) – *The Bell Curve*

• **Environment** as an Explanation
  – Kamin’s cornfield analogy – socioeconomic disadvantage
  – Steele (1997) - stereotype vulnerability
Individual variation in corn plant heights within each group (cause: genetic variation in the seeds)

Field A:
More fertile soil
Differences in average corn plant height between groups (cause: the soils in which the plants were grown)

Field B:
Less fertile soil

Figure 9.17 Genetics and between-group differences on a trait
New Directions in the Study of Intelligence

- **Biological Indexes and Correlates of Intelligence**
  - Reaction time and inspection time
  - Brain size
- **Cognitive Conceptualizations of Intelligence**
  - Sternberg’s triarchic theory and successful intelligence
- **Expanding the Concept of Intelligence**
  - Gardner’s multiple intelligences
  - Goleman’s emotional intelligence
Figure 9.20  Sternberg’s triarchic theory of intelligence
Figure 9.24 Estimated prevalence of psychological disorders among people who achieved creative eminence