

Study Guide 13-1

Characteristics of Psychological Tests

For use with textbook pages 343-347

Key Terms

reliability the ability of a test to give the same results under similar conditions (page 344)

validity the ability of a test to measure what it is intended to measure (page 345)

percentile system ranking of test scores that indicates the ratio of scores lower and higher than a given score (page 346)

norms standard of comparison for test results developed by giving the test to large, well-defined groups of people (page 346)

Drawing From Experience

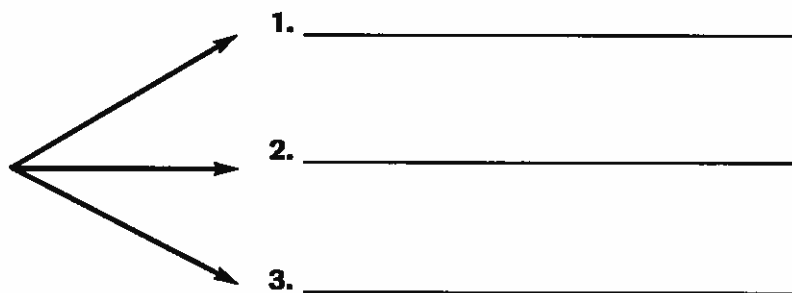
Have you ever taken a test given to everyone in your class? Did you know what your score meant? Did you think the test was fair?

In this section, you will learn about what makes a good test. You will also learn how to tell what your score means on some types of tests.

Organizing Your Thoughts

Use the diagram below to help you take notes as you read the summaries that follow. Think about the three requirements for a test to be fair and useful as a measurement tool.

For a test to be fair and useful, it must be . . .



Read to Learn

Introduction (page 343)

All tests make it possible to find out a lot about someone in a short time. Some tests forecast how well a person might do in a certain career. Others help people see what types of tasks they like and have the ability to do. Still others reveal psychological problems. Tests can show how one individual compares to

many others, measure behavior, and predict in general how people will perform. They do not determine how any individual will behave. People should consider other things, not just test scores, when making decisions about their future.

4. How might a test that shows your interests and abilities help you make decisions about your future?
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Test Reliability (page 344)

For a test to be fair and useful, it must be reliable. **Reliability** is a test's consistency. It is the test's ability to give the same results in similar situations. For example, you take a test today and then take it again a week later. If the test is reliable, your scores should be about the same. If your scores are very different, then the test is not reliable. This method for judging reliability is called *test-retest* reliability.

Another way to judge a test's reliability is to have more than one person grade it. For example, both your teacher and another teacher grade your essay. One gives you a B and the other, a D. In this case, the test is not reliable. The score depends more on who grades the test than on you. This is called *interscorer* reliability. Suppose the same teacher scores the same essay differently at different times. If so, the test is not reliable. This method of judging reliability is called *scorer* reliability. On a reliable test, your score would be the same no matter who graded it or when it was graded.

Another way to judge reliability is to randomly divide the test items in half and score each half separately. The two scores should be about the same. This is called *split-half* reliability. For example, if the test is supposed to measure reading ability, you should not score high on one section and low on the other.

5. Say you took a test that showed you are better at math than 60 percent of everyone else who took the test. You took the test again a month later, and it said you are better at math than 61 percent of others who took the test. Is this test reliable?
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Test Validity (page 345)

For a test to be fair and useful, it must be valid as well as reliable. **Validity** is the test's ability to measure what it is supposed to measure. For example, a vocabulary test would not be a valid test of your math skills. A history test that asks questions not covered in class is not a valid test of what you learned in class. One way to judge a test's validity is to find out how well it predicts performance. This is *predictive* validity. For example, people take a test designed to measure management ability. If the test is valid, then most people who score high on the test should turn out to be good managers. If they do not, then the test is not valid. It does not measure what it is supposed to measure. If the test

does do well at predicting who will make good managers, then the company might use it to help decide whom to hire as managers.

6. The people who score high on the management ability test turn out to be good at getting their employees to produce more. Many of these managers, however, make poor decisions. Is the test valid? Explain.
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Standardization (page 345)

For a test to be fair and useful, it has a third requirement. It must be *standardized* as well as reliable and valid. Standardization refers to two things. First, the people who give the test must give the same instructions and score the test the same way every time. Second, a standardized test must have norms, or average scores, determined from the scores of many people.

Suppose a child answers 32 of 50 questions correctly on a fifth grade vocabulary test. What does this score mean? If the test is reliable and valid, then the score means that the child will probably understand a certain percentage of the words in a book written at the fifth grade level. In other words, the score predicts how the child will perform at the fifth grade reading level. Yet this “raw” score does not tell us where the child stands in relation to other fifth graders. If most fifth graders answered 45 or more questions correctly, then 32 is a low score. If most answered 20 questions correctly, then 32 is a high score.

People who make standardized tests use norms to set up a scale for comparing. They do this by turning raw test scores into a percentile system. This is like “grading on a curve.” First, they order the test scores actually achieved on the test from lowest to highest. Then they compare each score with this list and assign a percentile according to the percentage of scores that fall above or below this score. For example, if half the fifth graders in the above example scored 32 or below, then the score of 32 would be at the 50th percentile. If 32 were the top score, then it would be the 100th percentile. If one-fourth (25%) of all fifth graders taking the test scored higher than 32, then the score of 32 would put the child in the 75th percentile. This means that the child scored higher than three-fourths and lower than one-fourth of the others taking the test.

The test makers give the test to a large number of people in the group to be measured. For example, if they designed the test for fifth graders, they give it to many fifth graders. If the test is designed for engineers, then they give it to a large group of engineers. They determine percentiles from the scores achieved by this sample group. These percentiles then become the standards of comparison, or the test’s norms. Test takers can then compare their scores to these norms to see how they stack up to others who took the test. For example, your percentile on the Scholastic Assessment Test (SAT) shows your standing among people your own age and grade. Remember that norms are averages. They are not some exact standard that you “should” meet.

7. If you scored at the 60th percentile on a standardized test, what does this mean?
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**Study
Guide****13-2***For use with textbook pages 348–357***Intelligence Testing****Key Terms**

Intelligence the ability to acquire new ideas and new behavior and to adapt to new situations (page 348)

two-factor theory proposes that two factors contribute to an individual's intelligence (page 349)

triarchic theory proposes that intelligence can be divided into three ways of processing information (page 350)

emotional intelligence includes four major aspects of interpersonal and intrapersonal intelligence (page 351)

intelligence quotient (IQ) standardized measure of intelligence based on a scale in which 100 is average (page 352)

heritability the degree to which a characteristic is related to inherited genetic factors (page 355)

cultural bias an aspect of an intelligence test in which the wording used in questions may be more familiar to people of one social group than to another group (page 356)

Drawing From Experience

Think about someone you think is really smart. What makes you think this person is smart? Based on what you have observed about this person, what are some characteristics of an intelligent person?

In the last section, you learned what makes a test reliable, valid, and standard. This section discusses different theories of intelligence and the tests that try to measure it.

Organizing Your Thoughts

Use the diagram below to help you take notes as you read the summaries that follow. Think about the theories that define intelligence in different ways. For each theory listed, name two types of intelligence the theory identifies.

| Theory | One Type of Intelligence | Another Type of Intelligence |
|------------------------|--------------------------|------------------------------|
| Two-Factor Theory | 1. | 2. |
| Thurstone's Theory | 3. | 4. |
| Gardner's Theory | 5. | 6. |
| Triarchic Theory | 7. | 8. |
| Emotional Intelligence | 9. | 10. |

Read to Learn

Introduction (page 348)

Psychologists do not agree on the meaning of the word *intelligence*. Most believe that *intelligence* is the ability to learn new ideas and new behavior and to adapt to new situations. Others think intelligence allows you to do well in school and on tests.

11. Do you think someone could be intelligent but do poorly in school? Explain.

Views of Intelligence (page 348)

According to Charles Spearman's **two-factor theory**, intelligence is the combination of a person's general intelligence and specific mental skills. General intelligence is the person's ability to perform difficult mental work, such as problem solving. Specific mental skills are things like verbal (language) or math skills.

L.L. Thurstone did not support the idea of general intelligence. Instead, he believed that intelligence is made up of seven mental abilities. These are the ability to (1) understand words and ideas (verbal comprehension), (2) use numbers to solve problems (numerical ability), (3) see patterns in things in space (spatial relations), (4) perceive things quickly (perceptual speed), (5) use words easily (word fluency), (6) recall information (memory), and (7) understand general rules based on information (inductive reasoning).

Howard Gardner identified eight types of intelligence. They are (1) ability with words; (2) math reasoning; (3) spatial ability, the ability to find your way around in an environment and mentally picture it; (4) musical ability; (5) physical skills, the ability to do small movements like thread a needle; (6) interpersonal skills, the ability to understand the feelings of others; (7) intrapersonal skills, knowledge of oneself; and (8) naturalist intelligence, the ability to identify patterns in nature.

Robert Sternberg's **triarchic theory** proposes that intelligence is made up of three ways of processing information. The first way is *analytical* thinking, or the ability to solve problems. The second way is *creative* thinking, which is the ability to find new ways to solve problems and deal with new situations. The third way is *practical* thinking, which helps you adjust to your environment.

Another proposed type, **emotional intelligence**, is similar to Gardner's interpersonal and intrapersonal intelligence. It includes the ability to (1) perceive and express emotions, (2) use emotions while thinking, (3) understand emotions and use this understanding, and (4) direct one's emotions toward personal growth.

12. The theories of Spearman, Thurstone, Gardner, and Sternberg are similar in some ways. Name two types of ability that are included in at least two of these theories.

The Development of Intelligence Tests (page 352)

In 1904, schools in France asked Alfred Binet and Theodore Simon to prepare a test that would pick out “slow learners.” Then the schools could place these slow learners in special classes. Binet was not able to define intelligence. However, he believed that whatever it is, it increases with age. That is, older children have more intelligence than younger children. Therefore, in selecting items for his test, he included only items on which older children did better than younger children. By asking the same questions of many children, Binet determined the average age at which a certain question could be answered. For example, he discovered that some questions could be answered by most 12-year-olds but not 11-year-olds. If a child of 11, or even 9, could answer these questions, that child was said to have a mental age of 12. If a 12-year-old could answer questions no higher than those for 9-year-olds, then that child was said to have a mental age of 9. Slow learners were those with mental ages below their actual ages.

The Stanford-Binet Intelligence Scale currently in use still groups test items by age level. The intelligence quotient (IQ) score is based on a scale in which 100 is average for the person’s age group. For example, if you have an IQ of 100, this means that half the test takers your age did better than you and half did worse than you.

The Stanford-Binet test has been largely replaced by the Otis-Lennon Ability Test. This test tries to measure mental abilities that relate to a student’s ability to succeed in school. It measures a student’s verbal (language) and non-verbal skills.

The Wechsler-Adult Intelligence Scale (WAIS) uses a different version for different age groups. These tests give percentile ratings for several areas, including vocabulary, arithmetic, picture arrangement, and others. Graders use these ratings to compute separate IQ scores for verbal and performance areas.

13. If someone had an IQ of 96 on the Stanford-Binet test, what would this mean?

The Uses and Meaning of IQ Scores (page 353)

Most intelligence tests set norms in such a way that most people score near 100. About 95 percent of people score between 70 and 130. Only a little more than 2 percent score at or above 130. These people are in at least the 97th percentile. Those who score below 70 have been classified as mentally handicapped. Mental handicaps are classified more specifically from mildly handicapped (55–69) to profoundly handicapped (below 25).

IQ scores do accurately predict which people will do well in school. Yet does success in school or the ability to take a test really indicate intelligence? This question is at the heart of the argument over IQ tests.

14. Look at Figure 13.9 in the text. If your IQ is 104, how would your intelligence be classified?

Controversy Over IQ Testing (page 355)

Differences in IQ scores may be due to genetics (the intelligence people inherit) or to the environment they come from. This is the familiar nature versus nurture debate. Heritability is a measure of how much of a characteristic is genetic. Studies show that between 52 percent and 70 percent of differences in IQ scores is related to heredity. Studies also show that environmental factors such as richness of the home environment, quality of food, and the number of brothers and sisters in the family also affect IQ.

Intelligence tests also have a cultural bias. That is, the wording of the questions may be more familiar to people of one social group than another. For example, on one intelligence test the correct response to the question “What would you do if you were sent to buy bread and the grocer said he did not have any more?” was “try another store.” However, many minority students responded “go home.” When questioned, they said that their neighborhood has only one store.

15. How might an IQ test be culturally biased against a Hispanic student?

Study Guide 13-3

Measuring Achievement, Abilities, and Interests

For use with textbook pages 359–362

Key Terms

aptitude test estimates the probability that a person will be successful in learning a specific new skill (page 360)

achievement test measures how much a person has learned in a given subject or area (page 360)

interest inventory measures a person's preferences and attitudes in a wide variety of activities to identify likely areas of success (page 361)

Drawing From Experience

Have you ever wondered what career would be right for you? What kinds of activities do you like? If a test could help you narrow your choices, would you take it?

In the last section, you learned about the nature of intelligence and intelligence testing. This section describes tests designed to measure your ability to learn new skills, your current knowledge in certain subjects, and what career choices might interest you.

Organizing Your Thoughts

Use the diagram below to help you take notes as you read the summaries that follow. Think about the three types of tests discussed in this chapter. For each example below, name the test that is designed to reveal this kind of result.

| Test Result | Type of Test |
|---|--------------|
| You scored higher than others in your grade level in your knowledge of algebra. | 1. |
| You show a strong talent for art and mechanical drawing. | 2. |
| You would prefer a job in which you work with your hands over one that requires you to sit at a desk all day. | 3. |

Read to Learn

Introduction (page 359)

Intelligence tests are just one type of test. Psychologists have developed other tests to reveal special abilities and experiences. These include aptitude tests, achievement tests, and interest tests.

4. How might a test help you decide which careers to consider?

Aptitude Tests (page 360)

Aptitude tests try to discover a person's talents and to predict how well he or she will be able to learn a new skill. Two such tests are the Differential Aptitude Test (DATE) and the General Aptitude Test Battery (GATB). Test results show a person's promise for a large number of occupations (job fields). The SAT and American College Test (ACT) are general aptitude tests. They are designed to predict a student's success in college. The best predictor of how well students will do in college is their performance in high school. Colleges use both high school grades and the results of tests like the ACT to predict college success.

5. Why might you want to pursue a career that matches your talents?

Achievement Tests (page 360)

Achievement tests measure how much a person has already learned in a subject area. Achievement tests and aptitude tests overlap in what they measure. Aptitude is defined as inborn ability. Tests that measure aptitude also measure some learning. Achievement tests often predict job talents as well as measure how much a student already knows. Because of the overlap, the two types of tests are classified by purpose more than content. Thus, a test used to predict future ability is considered an aptitude test. A test used to determine what someone already knows is an achievement test.

Adaptive testing is a type of achievement test given by a computer. The computer changes the difficulty of the questions to adapt to the test taker's performance. For example, if you answer several problems correctly, the computer will challenge you with harder problems. The purpose is to measure your ability by finding the right difficulty level for you.

6. How do achievement tests overlap with aptitude tests in what they measure?

Interest Inventories (page 361)

Tests that measure abilities have right and wrong answers. Interest inventories do not. The purpose of an **interest inventory** is to measure your interests in some activities over others. Interest inventories try to find out what you like, not what you know. They compare the individual's responses to those of people in particular job fields. If your answers are like those of people in a certain job, then you would probably enjoy and succeed in that field. Suppose that the responses of most engineers on the inventory showed that they would rather be astronomers than coaches. If you responded like the engineers on many such questions, the inventory would rate your interests as high in engineering. The purpose of inventories like the Kuder Preference Record is to help people find the right career.

7. Why don't interest inventories have right and wrong answers?

Study Guide 13-4

Personality Testing

For use with textbook pages 363–368

Key Terms

personality test assesses an individual's characteristics and identifies problems (page 363)

objective test forced-choice test (in which a person must select one of several answers) designed to study personal characteristics (page 364)

projective test unstructured test in which a person is asked to respond freely, giving his or her own interpretation of various ambiguous stimuli (page 366)

Drawing From Experience

Do some people you know like to go to parties with lots of people, while others prefer to be with just one or two close friends? Do you relate to some people differently than others because you know how each is likely to respond?

The last section discussed aptitude, achievement, and interests. In this section, you will learn about different types of personality tests.

Organizing Your Thoughts

Use the diagram below to help you take notes as you read the summaries that follow. Think about the differences among the personality tests. For each test listed below, give a major characteristic that makes it different from the other tests.

| Test | Major Difference |
|-------------------|------------------|
| MMPI-2 | 1. |
| CPI | 2. |
| Myers-Briggs test | 3. |
| Rorschach test | 4. |
| TAT | 5. |

Read to Learn

Introduction (page 363)

Psychologists use **personality tests** to identify personality characteristics and problems. These tests can also help predict how a person might behave in the future.

6. Think about someone who has a personality very different from yours. When faced with a crisis, how would you expect this person to act compared to how you would act?

Objective Personality Tests (page 364)

Objective tests are usually limited- or forced-choice tests. That is, each question gives a few choices, and you must select one of them. One objective test, the Minnesota Multiphasic Personality Inventory (MMPI), consists of statements to which a person can respond *true*, *false*, or *cannot say*. The items on the MMPI reveal habits, fears, and symptoms of psychological disorders. Statements related to a certain characteristic, such as depression, are scattered throughout the test. When psychologists score the test, they group these answers together into a single depression scale. The MMPI has 10 such scales. Psychologists look for patterns of responses, not scores on individual items. The MMPI-2, a revision, was published in 1990.

The questions were selected for the test because studies showed that these questions can help separate people into different personality categories. For example, if you answer *false* to "I attend religious services frequently," you will score one point on the depression scale. This and other items like it were included because more depressed than nondepressed people answer *false* to this item.

The California Psychological Inventory (CPI) is similar to the MMPI, but was developed for more general use. It does not contain questions that reveal mental illnesses. It measures traits such as responsibility, self-control, and tolerance. The CPI is used to predict things like adjustment to stress, leadership, and job success.

The Myers-Briggs test focuses on how a person takes in information, makes decisions, and approaches day-to-day tasks. The test groups personality on four scales: extraversion vs. introversion, intuition vs. sensing, feeling vs. thinking, and judging vs. perceiving. For example, an extrovert prefers activities with other people, while an introvert enjoys being alone. The idea behind the test is that each person's personality is a combination of these characteristics. The characteristics that are stronger in your personality will influence your communication style, how you conduct relationships, your work style, and your lifestyle choices. The purpose of the test is to help you understand your

own personality, so that you can better understand how you relate to others and others relate to you. Hopefully, this knowledge will help you live a more rewarding life. Businesses use the test to make better hiring and promotion decisions.

7. How might the Myers-Briggs test help businesses decide whom to hire as a salesperson?

Projective Personality Tests (page 366)

Projective tests encourage test takers to respond freely, giving their own thoughts about each test item. These tests invite people to tell stories about pictures, diagrams, or objects. Because the test items have no set meaning, the story a person tells must say something about the person's needs, wishes, fears, and other aspects of personality. The test taker "projects" his or her unconscious feelings onto the test items.

The Rorschach inkblot test has 10 cards containing inkblot designs. The psychologist hands the ink blots one by one to the test taker and asks the person to say what he or she sees. There are no right or wrong answers. The theory is that what the person says reveals personality.

The Thematic Apperception Test (TAT) is a series of 20 cards with pictures of vague situations. Test takers are asked to tell a story about the situation. The interpreter focuses on the themes in the stories and the needs of the main characters. The responses are used to identify motivation and personality characteristics and problems.

8. Have you ever looked up at the clouds and seen patterns, such as a dog or person? How is this activity similar to a Rorschach test?
