

# 1



## Thinking Critically With Psychological Science

### CHAPTER OVERVIEW

Chapter 1 explains the limits of intuition and common sense in reasoning about behavior and mental processes. To counteract our human tendency toward faulty reasoning, psychologists adopt a scientific attitude that is based on curiosity, skepticism, humility, and critical thinking. Chapter 1 also explains how psychologists, using the scientific method, employ the research strategies of description, correlation, and experimentation in order to objectively describe, predict, and explain behavior.

The next section discusses how statistical reasoning is used to help psychologists describe data and to generalize from instances. To describe data, psychologists often rely on measures of central tendency such as the mean, median, and mode, as well as variation measures such as the range and standard deviation. Statistical reasoning also helps psychologists determine when it is safe to generalize from a sample to the larger population.

Chapter 1 concludes with a discussion of several questions people often ask about psychology, including why animal research is relevant, whether laboratory experiments are ethical, whether behavior varies with culture and gender, and whether psychology's principles don't have the potential for misuse.

Chapter 1 introduces a number of concepts and issues that will play an important role in later chapters. Pay particular attention to the strengths and weaknesses of descriptive and correlational research. In addition, make sure that you understand the method of experimentation, especially the importance of control conditions and the difference between independent and dependent variables. Finally, you should be able to discuss three important principles concerning populations and samples, as well as the concept of significance in testing difference.

NOTE: Answer guidelines for all Chapter 1 questions begin on page 31.

### CHAPTER REVIEW

First, skim each section, noting headings and boldface items. After you have read the section, review each objective by answering the fill-in and essay-type questions that follow it. As you proceed, evaluate your performance by consulting the answers beginning on page 31. Do not continue with the next section until you understand each answer. If you need to, review or reread the section in the textbook before continuing.

#### The Need for Psychological Science (pp. 19–26)

David Myers at times uses idioms that are unfamiliar to some readers. If you do not know the meaning of any of the following words, phrases, or expressions in the context in which they appear in the introduction to this chapter and in this section, refer to pages 38–40 for an explanation: *to remedy their own woes*; *winnow sense from nonsense*; *dresses it in jargon*; *bull's eye*; *"Out of sight, out of mind"*; *"Absence makes the heart grow fonder"*; *familiarity breeds contempt*; *drop a course*; *lackluster predictions*; *hard-headed curiosity*; *leap of faith*; *the proof is in the pudding*; *auras*; *crazy-sounding ideas*; *arena of competing ideas*; *so much the worse for our ideas*; *"The rat is always right"*; *the spectacles of our preconceived ideas*; *gut feelings*; *debunked*; *"play the tape"*; *sift reality from illusion*.

4. An important factor in the validity of survey research is the \_\_\_\_\_ of questions.
5. The tendency to overestimate others' agreement with us is the \_\_\_\_\_.
6. Surveys try to obtain a \_\_\_\_\_ sample, one that will be representative of the \_\_\_\_\_ being studied. In such a sample, every person \_\_\_\_\_ (does/does not) have a chance of being included.
7. Large, representative samples \_\_\_\_\_ (are/are not) better than small ones.
8. We are more likely to overgeneralize from select samples that are especially \_\_\_\_\_.

**Objective 7:** Identify an advantage and a disadvantage of using naturalistic observation to study behavior.

9. The research method in which people or animals are directly observed in their natural environments is called \_\_\_\_\_.
10. Case studies, surveys, and naturalistic observation do not explain behavior; they simply \_\_\_\_\_ it.
11. Using naturalistic observation, researchers have found that people are more likely to laugh in \_\_\_\_\_ situations than in \_\_\_\_\_ situations. Also, using observations of walking speed and the accuracy of public clocks, researchers have concluded that the pace of life \_\_\_\_\_ (varies/does not vary) from one culture to another.

### Correlation (pp. 30–36)

If you do not know the meaning of any of the following words, phrases, or expressions in the context in which they appear in the text, refer to page 40 for an explanation: *naked eye*; *flipped a coin*; "cold hands" . . . "hot hands."

**Objective 8:** Describe positive and negative correlations, and explain how correlational measures can aid the process of prediction.

1. When changes in one factor are accompanied by changes in another, the two factors are said to be \_\_\_\_\_, and one is thus able to \_\_\_\_\_ the other. The mathematical expression of this relationship is called a \_\_\_\_\_.
2. Graphs called \_\_\_\_\_ are often used to depict the relationship between two sets of scores.
3. If two factors increase or decrease together, they are \_\_\_\_\_. If, however, one decreases as the other increases, they are \_\_\_\_\_. Another way to state the latter is that the two variables relate \_\_\_\_\_.

If your level of test anxiety goes down as your time spent studying for the exam goes up, would you say these events are positively or negatively correlated? Explain your reasoning.

**Objective 9:** Explain why correlational research fails to provide evidence of cause-effect relationships.

4. A negative correlation between two variables does not indicate the \_\_\_\_\_ or \_\_\_\_\_ of the relationship. Nor does correlation prove \_\_\_\_\_; rather, it merely indicates the possibility of a \_\_\_\_\_ relationship.
5. A correlation between two events or behaviors means only that one event can be \_\_\_\_\_ from the other.

The measurable factor that may change as a result of these manipulations is called the \_\_\_\_\_ variable.

9. The aim of an experiment is to \_\_\_\_\_ a(n) \_\_\_\_\_ variable, \_\_\_\_\_ the \_\_\_\_\_ variable, and \_\_\_\_\_ all other \_\_\_\_\_.

Explain at least one advantage of the experiment as a research method.

**Statistical Reasoning** (pp. 39–44)

If you do not know the meaning of any of the following words, phrases, or expressions in the context in which they appear in the text, refer to pages 40–41 for an explanation: *Off-the-top-of-the-head estimates; national income cake; gauges; data are “noisy.”*

**Objective 15:** Explain the importance of statistical principles, and give an example of their use in everyday life.

1. Researchers use \_\_\_\_\_ to help them see and interpret their observations.

**Objective 16:** Explain how bar graphs can misrepresent data.

2. Once researchers have gathered their \_\_\_\_\_, they must \_\_\_\_\_ them. One simple way of visually representing data is to use a \_\_\_\_\_. It is important to read the \_\_\_\_\_ and note the \_\_\_\_\_ to avoid being misled by misrepresented data.

**Objective 17:** Describe the three measures of central tendency, and tell which is most affected by extreme scores.

3. The three measures of central tendency are the \_\_\_\_\_, the \_\_\_\_\_, and the \_\_\_\_\_.
4. The most frequently occurring score in a distribution is called the \_\_\_\_\_.
5. The mean is computed as the \_\_\_\_\_ of all the scores divided by the \_\_\_\_\_ of scores.
6. The median is the score at the \_\_\_\_\_ percentile.
7. When a distribution is lopsided, or \_\_\_\_\_, the \_\_\_\_\_ (mean/median/mode) can be biased by a few extreme scores.

**Objective 18:** Describe two measures of variation.

8. Averages derived from scores with \_\_\_\_\_ (high/low) variability are more reliable than those with \_\_\_\_\_ (high/low) variability.
9. The measures of variation include the \_\_\_\_\_ and the \_\_\_\_\_.
10. The range is computed as the \_\_\_\_\_.
11. The range provides a(n) \_\_\_\_\_ (crude/accurate) estimate of variation because it \_\_\_\_\_ (is/is not) influenced by extreme scores.
12. The standard deviation is a \_\_\_\_\_ (more accurate/less accurate) measure of variation than the range. Unlike the range, the standard deviation \_\_\_\_\_ (takes/does not take) into consideration information from each score in the distribution.

Describe the goals of the ethical guidelines for psychological research.

**Objective 24:** Describe how personal values can influence psychologists' research and its application, and discuss psychology's potential to manipulate people.

8. Psychologists' values \_\_\_\_\_ (do/do not) influence their theories, observations, and professional advice.
9. Although psychology \_\_\_\_\_ (can/cannot) be used to manipulate people, its purpose is to \_\_\_\_\_.
10. (Thinking Critically) The viewpoint called \_\_\_\_\_ questions scientific objectivity, arguing that most scientific concepts are merely \_\_\_\_\_ constructs. Psychological scientists \_\_\_\_\_ (agree/disagree) on whether there is, in fact, a "real world" of psychological principles that science can reveal.
11. (Thinking Critically) People who serve on juries in capital punishment cases \_\_\_\_\_ (do/do not) represent the greater population. They are \_\_\_\_\_ (more/less) likely to be minorities and women.
12. (Thinking Critically) States with a death penalty \_\_\_\_\_ (have/do not have) lower homicide rates.

## PROGRESS TEST 1

### Multiple-Choice Questions

Circle your answers to the following questions and check them with the answers beginning on page 33. If your answer is incorrect, read the explanation for why it is incorrect and then consult the appropriate pages of the text (in parentheses following the correct answer).

1. After detailed study of a gunshot wound victim, a psychologist concludes that the brain region destroyed is likely to be important for memory functions. Which type of research did the psychologist use to deduce this?
  - a. the case study
  - b. a survey
  - c. correlation
  - d. experimentation
2. In an experiment to determine the effects of exercise on motivation, exercise is the:
  - a. control condition.
  - b. intervening variable.
  - c. independent variable.
  - d. dependent variable.
3. In order to determine the effects of a new drug on memory, one group of people is given a pill that contains the drug. A second group is given a sugar pill that does not contain the drug. This second group constitutes the:
  - a. random sample.
  - b. experimental group.
  - c. control group.
  - d. test group.
4. Theories are defined as:
  - a. testable propositions.
  - b. factors that may change in response to manipulation.
  - c. statistical indexes.
  - d. principles that help to organize, predict, and explain facts.
5. A psychologist studies the play behavior of third-grade children by watching groups during recess at school. Which type of research is being used?
  - a. correlation
  - b. case study
  - c. experimentation
  - d. naturalistic observation