**Chapter 1**

**Objective 1**| **Describe *hindsight bias,*and explain how it can make research findings seem like mere common sense.***Hindsight bias*(also called the *I-knew-it-all-along phenomenon*) is the tendency to believe, after learning an outcome, that we would have foreseen it. Thus, learning the outcome of a study can make it seem like obvious common sense. Scientific inquiry and critical thinking can help us overcome this tendency to overestimate our unaided intuition.

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**Objective 2**| **Describe how overconfidence contaminates our everyday judgments.**We are routinely *overconfident*of our judgments, thanks partly to our bias to seek information that confirms them. Science, with its procedures for gathering and sifting evidence, restrains error by taking us beyond the limits of our intuition and common sense.

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**Objective 3**| **Explain how the scientific attitude encourages critical thinking.**Although limited by the testable questions it can address, a scientific approach helps us sift reality from illusion. Scientific inquiry begins with an attitude—a curious eagerness to *skeptically*scrutinize competing ideas and an open-minded *humility*before nature. This attitude carries into everyday life as *critical thinking,*which examines assumptions, discerns hidden values, evaluates evidence, and assesses outcomes. Putting ideas, even crazy-sounding ideas, to the test helps us winnow sense from nonsense.

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**Objective 4**| **Describe how psychological theories guide scientific research.**Psychological *theories*organize *observations*and imply predictive *hypotheses*. After constructing precise operational definitions of their procedures, researchers test their hypotheses (predictions), validate and refine the theory, and, sometimes, suggest practical applications. If other researchers can replicate the study with similar results, we can then place greater confidence in the conclusion.

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**Objective 5**| **Identify an advantage and a disadvantage of using case studies to study behavior.**Researchers using case studies focus in depth on one individual, in the hope of revealing universal principles. Case studies describe behavior. They can suggest hypotheses, but studying an unrepresentative individual may lead to false conclusions.

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**Objective 6**| **Identify the advantages and disadvantages of using surveys to study behavior and mental processes, and explain the importance of wording effects and random sampling.**Surveys describe behavior by gathering information from a large number of people. This technique relies on people giving accurate self-reports of their attitudes or behaviors. Wording effects—subtle influences in the sequence or phrasing of questions— can affect responses. Random sampling helps researchers achieve a sample that fairly represents the population under study. Because random sampling chooses people by chance, each person in the entire group has an equal chance of participating.

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**Objective 7**| **Identify an advantage and a disadvantage of using naturalistic observation to study behavior.**Naturalistic observation gives researchers an opportunity to watch and record behavior in naturally occurring situations. Like other forms of description, naturalistic observation cannot explain behaviors, but it can expand our understanding and lead to hypotheses that can be studied by other methods.

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**Objective 8**| **Describe positive and negative correlations, and explain how correlational measures can aid the process of prediction.**A *correlation coefficient*is a statistical measure of the strength and duration of the relationship between two factors. In a positive correlation (ranging from 0 to ?1.00), the two factors rise or fall together. In a negative correlation (ranging from 0 to -1.00), one item rises as the other falls. Scatterplots and the correlations they reveal help us to see relationships that the naked eye might miss.

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**Objective 9**| **Explain why correlational research fails to provide evidence of cause-effect relationships.**A correlation indicates the *possibility*of a cause-effect relationship, but it does not prove causation or, if causation exists, the direction of the influence. A third factor may be the cause of the correlation.

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**Objective 10**| **Describe how people form illusory correlations.**Illusory correlations are random events that we notice and falsely assume are related. They arise from our sensitivity to dramatic or unusual events. Once we believe two things are related, we tend to notice and recall instances that confirm this belief.

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**Objective 11**| **Explain the human tendency to perceive order in random sequences.**We search for patterns in an attempt to make sense of the world around us. Patterns or sequences occur naturally in sets of random data, but we tend to interpret these patterns as meaningful connections.

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**Objective 12**| **Explain how experiments help researchers isolate cause and effect.**To discover cause-effect relationships, psychologists conduct *experiments*. By manipulating one or more factors of interest, and controlling other factors, experimenters can determine the effect on some behavior or mental process.

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**Objective 13**| **Explain why the double-blind procedure and random assignment build confidence in research findings.**In a double-blind procedure, neither the researchers nor the participants know whether participants are receiving the treatment or a placebo. This counteracts the possibility that a placebo effect or researchers’ expectations will unintentionally influence the study’s results. Random assignment minimizes preexisting differences between the groups by selecting people by chance for the experimental condition (the group exposed to the treatment) or the control condition (a group that experiences no treatment or a different version of the treatment).

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**Objective 14**| **Explain the difference between an independent and a dependent variable.**The independent variable is the factor you manipulate to study its effect. The dependent variable is the factor you measure to discover any changes that occur in response to these manipulations.

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**Objective 15**| **Explain the importance of statistical principles, and give an example of their use in everyday life.**Statistics help us to organize, summarize, and make inferences from data. We need not remember complicated formulas to think more clearly and critically about the data we encounter in everyday life. For example, understanding statistical concepts teaches us the importance of doubting big, round, undocumented numbers.

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**Objective 16**| **Explain how bar graphs can misrepresent data.**Scale labels and ranges used in bar graphs can be designed to minimize or maximize differences. When looking at statistical graphs in books and magazines and on TV and the Internet, think critically.

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**Objective 17**| **Describe the three measures of central tendency, and tell which is most affected by extreme scores.**The *median*is the middle score in a group of data. The *mode*is the most frequently occurring score. The *mean*, the arithmetic average, is most easily distorted by a few very high or very low scores.

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**Objective 18**| **Describe two measures of variation.**Measures of variation tell us how similar or diverse data are. A *range*describes the gap between the highest and lowest scores. The more useful measure, the*standard deviation,*states how much scores vary around the mean, or average, score.

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**Objective 19**| **Identify three principles for making generalizations from samples. 1.**Representative samples are better than biased samples. **2.**Less-variable observations are more reliable than those that are more variable. **3.**More cases are better than fewer.

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**Objective 20**| **Explain how psychologists decide whether differences are meaningful.**When averages from two samples are each reliable measures of their own populations, and the difference between them is relatively large, we can assume the difference is significant— that the result did not occur by chance alone. Statistical significance indicates the likelihood of a result’s occurring, not the importance of the result.

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**Objective 21**| **Explain the value of simplified laboratory conditions in discovering general principles of behavior.**Researchers test theoretical principles by intentionally creating a controlled, simplified environment in the lab. Their concern is not the particular behavior being studied, but rather the underlying general principles that help explain many behaviors.

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**Objective 22**| **Discuss whether psychological research can be generalized across cultures and genders.**Behaviors, ideas, attitudes, and traditions vary across cultures, but the principles that underlie them are shared, in part because of our common biological heritage. Biology also determines our sex, but our culture sets up expectations about what it means to be male or female. Males and females do differ in some ways, but they are biologically and psychologically much more alike than different.

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**Objective 23**| **Explain why psychologists study animals, and discuss the ethics of experimentation with both animals and humans.**Some psychologists study animals out of an interest in animal behavior. Others do so because knowledge of the physiological and psychological processes of animals gives them a better understanding of the similar processes operating in humans. Under ethical and legal guidelines, animals used in psychological experiments rarely experience pain. Nevertheless, animal rights groups raise an important issue: Even if it leads to the relief of human suffering, is an animal’s temporary suffering justified? Occasionally researchers temporarily stress or deceive people to learn something important. Professional ethical standards provide guidelines concerning the treatment of research participants, and university ethics committees safeguard participants’ well-being.

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**Objective 24**| **Describe how personal values can influence psychologists’ research and its application, and discuss psychology’s potential to manipulate people.**Psychology is not value-free. Psychologists’ own values influence their choice of research topics, their theories and observations, their labels for behavior, and their professional advice. In psychology as elsewhere, knowledge is power that can be used for good or evil. Psychology has the power to deceive, but so far, applications of psychology’s principles have been overwhelmingly for the good. Psychology can help us reach our goals, but it cannot decide what those goals should be.

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