

REVIEW QUESTIONS

- What are the three “grand issues” about behavior addressed by psychology?
- What are the major perspectives adopted by psychologists, and how do they differ?

Contemporary Psychology: Trends in the Twenty-First Century

Psychology is a tremendously diverse field—and quite a large one. As shown in Table 1.2, psychologists specialize in many different aspects of behavior. As a result, there is always a lot going on, and the field develops and changes in many ways at once. Among recent trends, however, two seem so important that they are worthy of special note: psychology’s growing attention to diversity and its focus on the possible role of evolution in human behavior. In addition, there is another important trend occurring—one that many psychologists themselves have not yet recognized: increasing use of the findings of psychology in other fields. Since this change, too, has important implications for psychology, we will comment briefly on it as well.

Table 1.2**Major Subfields of Psychology**

Psychologists specialize in studying many different aspects of behavior.

SUBFIELD	DESCRIPTION
Clinical psychology	Studies diagnosis, causes, and treatment of mental disorders
Counseling psychology	Assists individuals in dealing with many personal problems that do not involve psychological disorders
Developmental psychology	Studies how people change physically, cognitively, and socially over the entire life span
Educational psychology	Studies all aspects of the educational process
Experimental psychology	Studies all basic psychological processes, including perception, learning, and motivation
Cognitive psychology	Investigates all aspects of cognition—memory, thinking, reasoning, language, decision making, and so on
Industrial/organizational psychology	Studies all aspects of behavior in work settings
Psychobiology and evolutionary psychology	Investigates biological bases of behavior and the role of evolution in human behavior
Social psychology	Studies all aspects of social behavior and social thought—how we think about and interact with others
Cross-cultural and cultural psychology	Studies variability in behavior among societies and cultural groups around the world and investigates the mutual constitution of culture and psychological functions
Positive psychology	Studies optimal human functioning with a focus on human virtues, conditions leading to flourishing, well-being and meaningful life

Psychology and Diversity: The Multicultural Perspective

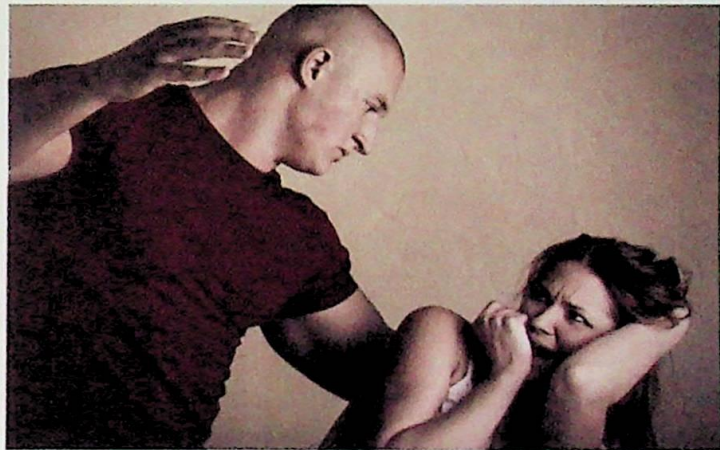
In the course of the growth of psychology as a modern discipline, largely a European and North American project, there was little recognition or appreciation of the importance of diversity—differences in the behavior or characteristics of individuals from different cultures or ethnic groups. Indeed, there was even little recognition of or interest in possible differences between males and females! The prevailing point of view was that if such cultural or gender differences exist, they are relatively unimportant. After all, psychology is a science, many people reasoned; so the principles and laws it establishes should apply to all human beings, regardless of where they live, their personal background, or their cultural identity. The developments in cross-cultural psychology (Berry et al., 1997), cultural psychology (Shweder, 1990) and indigenous psychology (Kim et al., 2006; Misra & Mohanty, 2002; Sinha, 1997) question such assertions and endeavor to develop culturally embedded understanding of psychological processes.

As you can readily guess, the point of view of 'psychic unity' no longer prevails. Although psychologists have not abandoned the goal of developing a body of knowledge that applies to all human beings, they have become far more aware of the importance of the tremendous cultural and ethnic diversity that is so much a part of our human heritage; and they now recognize that such differences must be included as a key part of our efforts to understand human behavior. As a result, psychology now adopts a multicultural perspective that pays careful attention to the role of such differences.

This perspective is demonstrated not only in the research conducted by psychologists but also in the guidelines they follow in providing psychological services (such as counseling) to ethnically and culturally diverse populations (American Psychological Association, 1993b). These guidelines require that psychologists recognize cultural diversity and take full account of it in all their activities. The practicing psychologists need to be sensitive to cultural, ethnic, and linguistic differences and that they build awareness of these differences into all their professional activities.

Figure 1.4 Domestic Violence: Strongly Affected by Cultural Values

Views about domestic violence vary greatly across cultures. In order to fully understand this serious problem, therefore, psychologists must take account of such diversity-related factors.



The Exportation of Psychology: From Science to Practice

48503

Most people realize that several branches of psychology are applied—not only do they seek to acquire basic knowledge about human behavior, they also attempt to put it to practical use. For instance, clinical psychologists help individuals deal with emotional and psychological problems, while industrial/organizational psychologists focus on solving practical problems relating to work (e.g., increasing motivation, evaluating employees' performance fairly and accurately). So, as we noted in the discussion of functionalism (one early school of psychology), psychology has always had a practical as well as a scientific side.

In recent years, however, application of psychology's knowledge about human behavior has expanded beyond psychology itself. Many other fields have found answers to some of their most important questions in the

findings and principles of psychology, and have begun to draw upon this knowledge to an increasing degree. In other words, as psychology has matured and become an ever richer source of knowledge about human behavior, persons in other fields have recognized this resource and put it to good use. How have they used the findings of psychology? In many ways: to improve procedures for the selection and training of employees, to enhance the performance of athletes, to improve classroom instruction, and to train police for better community relations, to mention just a few instances.

Please don't misunderstand: we are not referring here to people who are not trained psychologists but who try to practice psychology anyway—for example, to conduct therapy, design psychological tests, or advise businesses about how to handle their employees. Rather, we are referring to a much more legitimate use of psychological knowledge, often with the help and guidance of trained psychologists who serve as “exporters” of the knowledge of their field.

REVIEW QUESTIONS

- What is the multicultural perspective, and how do psychologists take account of it in their research and practice?
- Looking at the cultural diversity in India indicate some issues that need the attention of psychologists.
- What is meant by the “exportation of psychology”?

Food for Thought

Suppose some aspect of behavior made individuals highly attractive to the opposite sex—but also shortened their lives so that they died before they were fifty. According to evolutionary psychology, would this behavior become increasingly common, or would it die out?

Psychology and the Scientific Method

Knowing anything is based on our beliefs about the nature of things to be known (ontology), what can be known about that thing or object of knowledge (epistemology), and what are the ways we can find out those things (methodology). Taken together, these constitute a paradigm. Psychologists are generally inclined toward the use of scientific method in their effort to answer questions about cognitive processes and behaviors. They treat psychological phenomena as real and amenable to investigation through scientific methods. Indeed “science” has a strong appeal. It is held that science offers dependable knowledge based on evidence and also has improved the quality of life of the people.

Science has grown over several centuries and its developments are studied in philosophy of science. The initial view of positivism emphasized on induction to derive general truths from observations and verify theories. This view was modified and logical positivism was proposed which stated that scientists should use deduction to make specific predictions on the basis of general theories or principles. If the prediction comes true the theory is correct. This view was criticized by Popper who said that a scientific theory should be falsifiable. The scientists should try to disprove the theories.

The positivist mold of science is rooted in the following assumptions:

- **Empiricism:** The concepts and theories must be based on public evidence obtained through observation.
- **Determinism:** This refers to the belief that everything that happens has definite causes. Therefore, the goal of research is to find the causes of behavior and cognitive processes.
- **Parsimony:** In order to describe some phenomenon, scientists use relatively few words and as simply as possible.

The scientific findings are believed to have the following qualities:

- **Cumulative:** The studies in science are cumulative in nature. Therefore, any new work is based on earlier work.
- **Verifiable:** The results of scientific studies are such that they can be confirmed. The scientists should be able to replicate them by following the procedure used by the earlier researcher.
- **Public:** The scientific work is published and remains available to everyone who is interested in it. Communicating the findings in the public domain brings credibility to it and help furthering the process of research.

Kuhn, (1970) using the history of the development of science, has noted that science progresses through certain stages. Theories are preferred not on the basis of whether they are rejected or accepted. Scientists even reject contradictory findings. The phase during which scientists accept a common approach or paradigm is called period of normal science. Subsequently and over time when more contradictory findings accumulate different approach or paradigm is presented and a scientific revolution takes place.

To many people, the term science conjures up images of white-coated persons working around complex equipment in impressive laboratories. On the basis of such images, people then conclude that the word science applies only to fields such as chemistry, physics, or biology. Actually, though, this term refers simply to a special approach for acquiring knowledge—an approach involving the use of several key values or standards. Viewed in this light, the phrase scientific method refers simply to using these methods and adopting these values in efforts to study virtually any topic—any aspect of the world around us. We as human beings are part of the natural world, and thus the scientific method can certainly be applied to the study of our behavior and cognition. It is this adoption of the scientific method that makes psychology a science—and that makes the information it acquires so valuable.

The actual procedures used by psychologists in applying the scientific method are described in detail in a later section; here, we will focus on the values and standards that are essential components of the scientific method. Among the most important are these:

- **Accuracy:** A commitment to gathering and evaluating information about the world in as careful, precise, and error-free a manner as possible.
- **Objectivity:** A commitment to obtaining and evaluating such information in a manner as free from bias as humanly possible.
- **Skepticism:** A commitment to accepting findings as accurate only after they have been verified over and over again, preferably by many different scientists.
- **Open-mindedness:** A commitment to changing one's views—even views that are strongly held—in the face of evidence that these views are inaccurate.

Psychology, as a field, is deeply committed to these values. It is primarily for this reason that it can be described as a branch of science. In other words, because psychology plays by the rules—accepts and follows the guidelines of the scientific method—it qualifies for membership in the broad family of sciences that, together, have greatly enhanced human life.

The Role of Theory in the Scientific Method

There is one more aspect of the scientific method we should consider. In their research, scientists seek to do more than simply describe the world; they want to be able to explain it as well. For example, a chemist is not content merely to describe what happens when two chemicals are brought together in a test tube—the chemist also wants to be able to explain why this reaction happens. Similarly, a psychologist studying memory is not

content merely to describe the extent to which individuals forget various kinds of information; as a scientist, the psychologist also wants to be able to explain why such forgetting occurs (see Chapter 6 for information on this question). To accomplish this task, scientists in all fields engage in the construction of **theories**—frameworks for explaining various events or processes. The procedure involved goes something like this:

1. On the basis of existing evidence, a theory is formulated.
2. This theory, which consists of some basic concepts and statements about how these concepts are related, helps to organize existing information and also makes predictions about observable events.
3. These predictions, known as **hypotheses**, are then tested by actual observations—by research.
4. If results of new observations are consistent with the theory, confidence in it is increased. If they are not, the theory is modified and further tests of its predictions are performed.
5. Ultimately, the theory is either accepted as accurate or rejected as inaccurate. Even if it is accepted as accurate, however, it remains open to further refinement as additional research is conducted.

Theories: In science, frameworks for explaining various events or processes.
Hypotheses: Testable predictions derived from theories.

All this is a bit abstract, so a concrete example may help. Imagine that a psychologist has formulated a theory to explain why, often, people seem to become trapped by their own bad decisions: Once they have made a decision, they stick with it, even if growing evidence indicates that it was wrong. (This is known as escalation of commitment and is discussed in detail in Chapter 7.) For instance, sometimes a person who has purchased a stock will continue to hold it even as more and more bad news about the company appears in the newspapers and the stock price continues to drop. Similarly, people often remain in a bad marriage or bad relationship even though it is increasingly clear that their partner will never change or treat them better. A theory designed to explain escalation of commitment might be as follows: People get trapped in bad decisions because once they have made them, they feel a strong need to justify these decisions to others. Admitting they made a mistake would run counter to this need, so they find it very hard to escape from what is an increasingly negative situation. The psychologist would now derive predictions from this theory, and proceed to test them. One such prediction might be: If reversing an initial bad decision involves actions that other people can observe (e.g., divorce), it may be especially hard for persons to escape from the trap of escalating commitment. If, in contrast, reversal of the initial decision doesn't involve actions others can observe (e.g., selling a stock in private), it may be easier to escape.

The psychologist would then conduct research to test this hypothesis. If findings are consistent with the prediction, confidence in the theory is strengthened; if they are not, confidence in it is reduced, and the theory may be modified or ultimately rejected. This process, which lies at the core of the scientific method, is summarized in Figure 1.5. Many different theories relating to human behavior will be discussed in later chapters, so you will soon learn about many examples of this process as it actually operates in psychology.

Advantages of the Scientific Method: Why Common Sense Often Leads Us Astray

Human thinking is subject to several forms of error that can lead us badly astray. While these errors often save us mental effort and may in fact reflect evolved cognitive mechanisms that are generally helpful to us, they suggest that we should be cautious about relying on intuition or common sense when trying to understand human behavior. What are these errors like? We'll examine them in detail in later chapters, but let's take a brief look at some of the most important ones here.

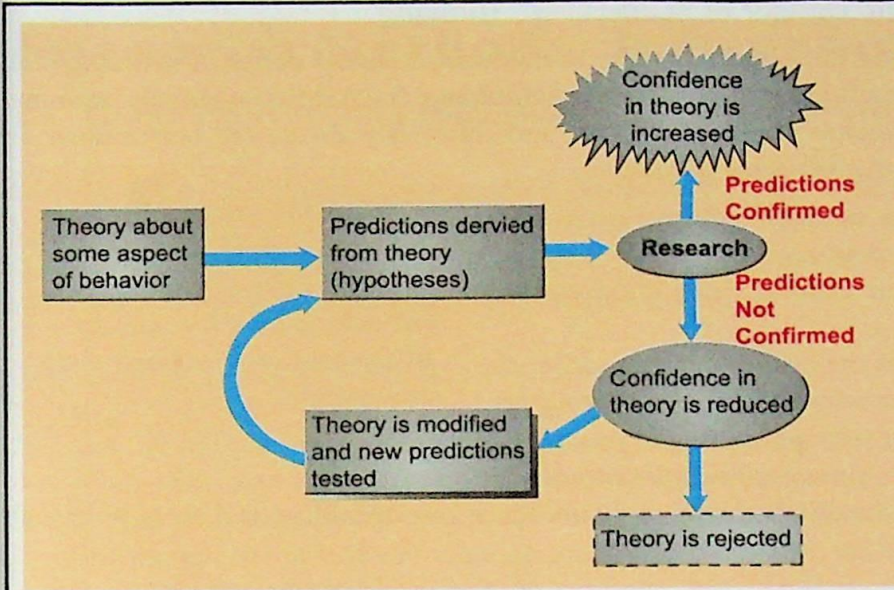


Figure 1.5
The Role of Theory in Psychological Research

Theories both organize existing knowledge and make predictions about how various events or processes will occur. Predictions derived from a theory (hypotheses) are tested through research. If results agree with the predictions, confidence in the theory is increased. If results do not agree with the predictions, confidence in the accuracy of the theory is reduced, and the theory is either altered or rejected.

The Confirmation Bias: The Tendency to Verify Our Own Views

If you are like most people, you prefer to have your views confirmed rather than refuted. Consider what this means when we attempt to use informal observation as a source of knowledge about human behavior. Because we prefer to have our views confirmed, we tend to notice and remember mainly information that lends support to these views—information that confirms what we already believe. This tendency, known as the **confirmation bias**, is very strong (e.g., Johnson & Eagly, 1989); and when it operates, it places us in a kind of closed system in which only evidence that confirms our existing beliefs is processed. Clearly, this is one tendency that can lead to errors in our efforts to understand others and ourselves.

The Availability Heuristic: Emphasizing What Comes to Mind First or Most Readily

Quick: Are there more words in English that start with the letter k (e.g., king) or more words in which k is the third letter (e.g., awkward)? If you answered, “More words that begin with k” you are like most people. Actually, though, this answer is wrong—more words have the letter k in the third position. What’s responsible for this type of error? A mental shortcut known as the **availability heuristic**. Because of this shortcut, which is designed to save us mental effort, the easier it is to bring something to mind, or the more information we can think of about it, the more importance we attribute to it—and the greater its impact on subsequent decisions or judgments. In general, this tendency makes sense: When we can bring information about something to mind easily, it often is important. But the availability heuristic can also lead us into error. Why? Because sometimes what we can bring to mind most readily isn’t especially important; it’s just highly memorable because it is dramatic or unusual (e.g., Rothman & Hardin, 1997). For instance, because airplane crashes are more dramatic and easier to remember than automobile accidents, many people believe that the chances of being killed in a plane are higher than those of being killed while driving—a conclusion that is totally false. Judgments based on common sense or intuition are often strongly influenced by the availability heuristic, so they are often untrustworthy for this reason.

Confirmation Bias:

The tendency to notice and remember primarily information that lends supports to our views.

Availability Heuristic: A

mental shortcut suggesting that the easier it is to bring something to mind, the more frequent or important it is.

Rational Versus Intuitive Thought: The Danger of “Gut-Level” Thinking

We are on much firmer ground if we employ the scientific method, which is specifically designed to reduce such potential sources of error, and if we are careful to engage in **critical thinking**. Such thinking closely examines all claims and assumptions, carefully evaluates existing evidence, and cautiously assesses all conclusions. In actual practice, critical thinking involves the following guidelines:

- Never jump to conclusions; gather as much information as you can before making up your mind about any issue.
- Keep an open mind; don't let your existing views blind you to new information or conclusions.
- Always ask “How?” as in “How was the evidence obtained?”
- Be skeptical; always wonder about why someone is making an argument, offering a conclusion, or trying to persuade you.
- Never be stampeded into accepting some view because others accept it.
- Be aware of the fact that your own emotions can strongly influence your thinking, and try to hold such effects to a minimum.

Critical Thinking: Thinking that avoids blind acceptance of conclusions or arguments but instead closely examines all assumptions, evidence, and conclusions.



Figure 1.6
Intuitive Thought: Sometimes It Poses Real Dangers

Public and government support for some safety devices—such as air bags and antilock brakes—was based at least in part on “gut-level” intuitive thinking: It just seemed reasonable that these devices would work. In fact, however, accident data indicate that these devices are less effective than many people believed. These findings illustrate the potential dangers of intuitive thought.

By adopting the scientific method and using critical thinking, psychologists vastly increase the probability that their efforts to attain valid information about human behavior will succeed. It is these commitments to the scientific method and careful thought that set psychology apart from other efforts to understand human behavior and make its findings so valuable from the perspective of enhancing human welfare.

REVIEW QUESTIONS

- Why can psychology be viewed as a branch of science?
- What values are central to the scientific method?
- What are theories, and what is their role in the scientific method?
- Why are common sense or “folk wisdom” such uncertain guides to human behavior?
- What are the confirmation bias, the availability heuristic, and intuitive thinking, and what role do they play in our efforts to understand human behavior?
- What is critical thinking, and what role does it play in psychology?
- Describe some factors that cause threat to objectivity in psychological investigations.

Research Methods in Psychology: How Psychologists Answer Questions about Behavior

Now that we have explained what modern psychology is and described the scientific method and its relation to critical thinking, it's time to turn to another key issue: How do psychologists actually go about the task of adding to our knowledge about human behavior? Primarily, you'll soon see, through the use of three basic procedures: observation, correlation, and experimentation.

Observation: Describing the World around Us

One basic technique for studying behavior—or any other aspect of the world—involves carefully observing it as it occurs. Such observation is not the kind of informal inquiry that all of us practice from childhood on; rather, in science, it is observation accompanied by careful, accurate measurement. For example, scientists studying the formation of tornadoes often drive hundreds of miles in order to be present at spots where tornadoes are likely to form. They do this because they wish to make careful observations of the physical events that occur as tornadoes actually take shape. The use of such **systematic observation** takes several different forms in the study of behavior.

Naturalistic Observation: Observing Behavior Where It Normally Occurs

Bonobo chimpanzees are a fascinating species. These small primates live in the tropical forests of Zaire and a few other countries, and they have recently been the subject of scientific interest. Why? Primarily because, in contrast to other primate species, including our own, they seem to live together in almost total harmony. Fights, bullying, and all other forms of aggression are almost unknown. What accounts for their calm and peaceful existence? One possibility involves their sexual behavior. Bonobos win the prize among all primates for high interest in sex. They often have sexual relations twenty or more times a day, and females are just as enthusiastic about these activities as males; indeed, females have twenty different gestures for signaling to males that they are interested! Bonobos seem to use sexual relations as a means of reducing tension or anxiety: Whenever they are frightened or upset, they quickly pair up and begin mating. Is there a lesson here for our own species—evidence that the 1970s slogan “Make love, not war” may well have some validity? No one knows for sure, but research on bonobos carried out through **naturalistic observation**—systematic study of their behavior in natural settings (Linden, 1992)—has certainly provided us with much food for thought.

Systematic Observation:

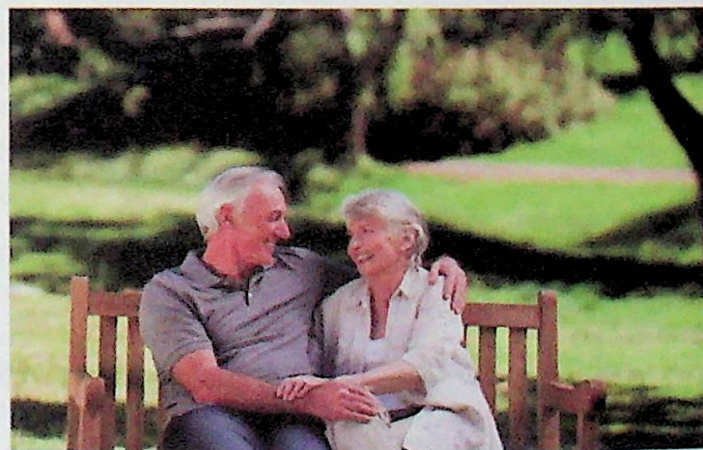
A basic method of science in which the natural world, or various events or processes in it, are observed and measured in a very careful manner.

Naturalistic Observation:

A research method in which behavior is studied in the settings where it usually occurs.

Figure 1.7
Naturalistic Observation of Human Behavior

Psychologists sometimes observe human behavior in the locations where it normally occurs. For example, recent studies have used such methods to study how and when people touch each other in public places.



While naturalistic observation is often used in the study of animal behavior, it is sometimes applied to human beings as well—especially to behavior in public places such as airports, shopping malls, and hotel lobbies (e.g., Hall & Veccia, 1991). Who touches whom in such locations? How do people use gestures? Information on these and many other forms of behavior can often be obtained from naturalistic observation, and we'll examine such research in several later chapters.

Case Studies: Generalizing from the Unique

Every human being is unique; each of us possesses a distinctive combination of traits, abilities, and characteristics. Given this fact, is it possible to learn anything about human behavior from detailed study of one individual or perhaps a few persons? Several famous psychologists have suggested that it is. They have adopted the **case method**, in which detailed information is gathered on specific individuals. The researchers then use this information to formulate principles or reach conclusions that, presumably, apply to large numbers of persons—perhaps to all human beings. By far the most famous practitioner of the case method was Sigmund Freud, who used a small number of cases as the basis for his famous theories of personality and mental illness. (We'll discuss these in Chapter 12.)

Is the case method really useful? In the hands of talented researchers such as Freud, it does seem capable of providing insights into various aspects of behavior. Moreover, when the behavior involved is very unusual, the case method can be quite revealing. In Chapter 6, we'll see how several unique cases have added to our understanding of the biological bases of memory. These cases involve individuals who experienced specific kinds of damage to the brain and, as a result, showed certain kinds of memory loss. By studying the pattern of such losses, psychologists have been able to piece together a more complete picture of how memories are stored in the brain (e.g., Squire, 1991). So, much can sometimes be learned from the case method. However, this method suffers from several important drawbacks. First, if the persons studied are unique, it can be misleading to generalize from them to other human beings. Second, because researchers using the case method often have repeated contact with the individuals they study, there is the real risk that they will become emotionally involved with these persons and so lose their scientific objectivity, at least to a degree. Because of such drawbacks, the case method is not widely used by psychologists today.

Case Method: A research method in which detailed information about individuals is used to develop general principles about behavior.

Survey Method: A research method in which large numbers of people answer questions about aspects of their views or their behavior.

Surveys: The Science of Self-Report

At the opposite end of the scale where systematic observation is concerned is the **survey method**. Here, instead of focusing in detail on a small number of persons, researchers obtain a very limited sample of behavior from large numbers of individuals, usually through their responses to questionnaires. Surveys are used for many purposes—to measure attitudes toward specific issues, voting preferences, and consumer reactions to new products, to mention just a few. Surveys can also be repeated over long periods of time in order to track changes in public opinion or other aspects of behavior. For instance, surveys of job satisfaction—individuals' attitudes toward their jobs—have continued for more than forty years. And changing patterns of sexual behavior have been followed by the Kinsey Institute since the 1940s.

The survey method offers several advantages. Information can be gathered quickly and efficiently from many thousands of persons. I used it myself recently to obtain information on the kinds of workplace aggression people encounter in their jobs, and results were clear: Most of the workplace aggression respondents witnessed or experienced was subtle and covert—not the kind of violence often emphasized by the mass media (Baron, Neuman, & Geddes, 1999). Further, since surveys can be constructed quickly, public opinion on new

issues can be obtained almost as soon as the issues arise. To be useful as a research tool, however, a survey must meet certain requirements. First, if the goal is to predict some event (for example, the outcome of an election), great care must be devoted to the issue of **sampling**—how the persons who will participate in the survey are selected. Unless these persons are representative of the larger population about which predictions will be made, serious errors can result.

Another issue deserving careful attention is the way in which surveys are worded. Even changing a single word in a question can sometimes shift the meaning—and strongly influence the results. Recently, for example, the governor of the state where one of the authors lives reduced the number of state employees in the capital by 450. How did people react to these reductions? In one poll they were asked to indicate how they felt about the governor’s “slashing” of the workforce; in another, they were asked to indicate how they felt about the governor’s “pruning” of the workforce. You can guess what happened: Results of the “slashing” poll suggested that the public was strongly against this action, while the responses to “pruning” indicated public support for the governor’s action!

In sum, the survey method can be a useful approach for studying some aspects of human behavior, but the results obtained are accurate only to the extent that issues relating to sampling and wording are carefully addressed.

Sampling: In the survey method, the methods used to select persons who respond to the survey.

Figure 1.8

Workplace Aggression: Not What the Media Suggest

Recent research using the survey method indicates that contrary to what many news reports suggest, overt physical assaults are very rare in work settings. In contrast, covert and subtle forms of aggression (e.g., failing to return messages, spreading false rumors about another person, using up supplies another person needs) are far more common.



Correlation: The Search for Relationships

At various times, you have probably noticed that some events appear to be related to each other: As one changes, the other appears to change too. For instance, you have probably observed that as people grow older, they often seem to gain weight; that when interest rates drop, the stock market rises; and that the richer people are, the more conservative they tend to be. When such relationships between events exist, we say that the events are correlated with each other (or that a correlation between them exists). This means that as one changes, the other tends to change too. Psychologists and other scientists refer to aspects of the natural world that can take different values as variables, so from now on that’s the term we will use here.

From the point of view of science, the existence of a correlation between two variables can be very useful. This is so because when a correlation exists, it is possible to predict one variable from information about one or more other variables. The ability to make such predictions is one important goal of science, and psychologists often attempt to make predictions about human behavior. To the extent predictions can be made accurately, important benefits follow. For instance, consider how useful it would be if we could predict from current information such future outcomes as a person’s success in school or in various occupations, effectiveness as a parent, length of life, or likelihood of developing a serious mental disorder.

The discovery of correlations between variables allows us to make such predictions. In fact, the stronger such correlations are, the more accurate the predictions that can be made. These facts constitute the basis for an important method of research—the **correlational method**. In this approach, psychologists or other scientists attempt to determine whether, and to what extent, variables are related to each other. This involves making careful observations of each variable and then performing statistical analyses to determine whether and to what extent the variables are correlated—to what extent changes in one are related to changes in the other. Correlations range from -1.00 to $+1.00$, and the more they depart from zero, the stronger the correlation. For instance, a correlation of $-.82$ is stronger than one of $+.23$. Positive correlations indicate that as one variable increases, the other increases too. For instance, the greater the number of hours students study for their psychology tests, the higher their grades tend to be. Negative correlations indicate that as one variable increases, the other decreases. For example, the less satisfied people are with their jobs, the more likely they are to search for another one and to leave. As job satisfaction decreases, in other words, quitting increases. Now let's examine a concrete example of how psychologists actually use the correlational method.

Correlational Method:

A research method in which researchers attempt to determine whether, and to what extent, different variables are related to each other.

The Correlational Method of Research: An Example

Suppose that a psychologist wanted to test the following hypothesis: *Use of small magnets strapped to various parts of one's body reduces joint and muscle pain.* How could research on this topic be conducted by the correlational method? Many possibilities exist, but one approach would be to measure both variables: the extent to which people used magnets and the amount of muscle or joint pain they experienced. The psychologist could measure magnet use by asking individuals to report the number of hours they wore magnets each day, or perhaps the number of magnets they used. Pain could be assessed by means of a rating scale on which the research participants would rate the intensity of the pain they experienced (e.g., from 1 for little or no pain, to 5 for intense pain). The researcher would then analyze these two sets of numbers through statistical procedures (statistics are a form of mathematics) to determine if they were correlated. If a positive correlation were obtained, this would offer support for the hypothesis, and would suggest that magnet use may indeed be linked to pain reduction.

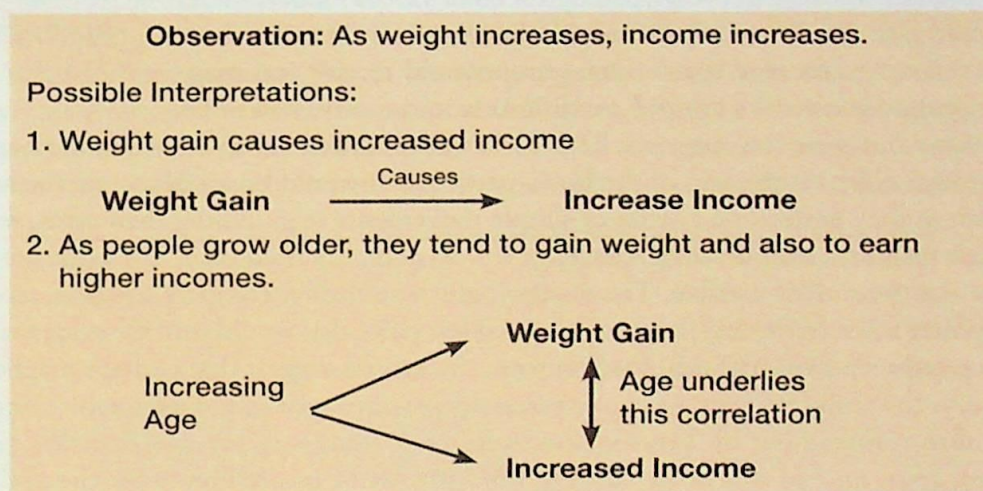
So far, so good. But watch out, for we are approaching a real danger zone—one in which many people seem to get confused. On the basis of findings indicating that as the use of magnets increased, pain decreased, many people would then jump to the following conclusion: *Wearing magnets causes reductions in pain.* This seems to make sense; after all, the greater people's use of magnets, the less pain they reported experiencing. But, in fact, such conclusions would not be justified, because correlational research does not, by itself, provide strong or direct evidence about cause-and-effect relationships. Indeed, this is one of the major drawbacks of such research. In this case, we may find that as magnet use increases, pain decreases—but we do not know whether these effects result from magnet use or from some other variable that is related to both magnet use and pain reduction.

For instance, it is quite possible that wearing magnets restricts people's movement. As a result, the more they wear them, the less they move around. This, in turn, might allow their injured muscles or joints to heal. If this were true, then it would not be the magnets themselves that cause pain reductions, but rather physical rest. Similarly, it could be the case that the more people use magnets, the stronger their beliefs that magnets work. These beliefs, not magnets themselves, may be responsible for reported reductions in pain. In short, although the correlational method of research can be very valuable—and is, for reasons we'll soon describe, sometimes the only method psychologists can use to study a specific topic or question—it cannot answer the

question “Why?” (as in “Why is magnet use related to pain reduction?”) in a very definitive way. For this reason, psychologists often use another research method, to which we’ll now turn.

Figure 1.9
Correlation Does Not Equal Causation

As shown by this example, the fact that two variables are strongly correlated does not guarantee that they are causally linked—that changes in one cause changes in the other. Instead, changes in both variables may stem from the influence of another factor—in this case, age.



REVIEW QUESTIONS

- What is naturalistic observation?
- What is the correlational method of research, and how do psychologists use it?
- Why are even strong correlations between variables not evidence that changes in one cause changes in the other?

The Experimental Method: Knowledge Through Systematic Intervention

In its most basic form, the experimental method in psychology involves two key steps: (1) The presence or strength of some variable believed to affect behavior is systematically altered, and (2) the effects of such alterations (if any) are carefully measured. The logic behind these steps is this: If the variable that is systematically changed does indeed influence some aspect of behavior, then individuals exposed to different levels or amounts of that factor should differ in their behavior. For instance, exposure to a low amount of the variable should result in one level of behavior, while exposure to a higher amount should result in a different level, and so on.

The factor systematically varied by the researcher is termed the **independent variable**, while the aspect of behavior studied is termed the **dependent variable**. In a simple experiment, then, different groups of participants are exposed to contrasting levels of the independent variable (such as low, moderate, and high). The researcher then carefully measures the research participant’s behavior to

Experimentation (the Experimental Method): A research method in which researchers systematically alter one or more variables in order to determine whether such changes influence some aspect of behavior.