8 Descriptive Research

To behold is to look beyond the fact; to observe, to go beyond the observation. Look at the world of people and objects around you, and you will be overwhelmed by what you see. But select from that world a well-chosen few, and observe them with insight, and they will tell you a great deal.

In this chapter we discuss types of quantitative study that fall under the broad heading *descriptive quantitative research*. This general category of research designs involves either identifying the characteristics of an observed phenomenon or exploring possible associations among two or more phenomena. In every case, descriptive research examines a situation *as it is*. It does not involve changing or modifying the situation under investigation, nor is it intended to determine cause-and-effect relationships.

As you proceed through the chapter, you will find several strategies—sampling, making observations, interviewing—that you encountered previously in the discussion of qualitative research in Chapter 6. This is old news, you might think. On the contrary, such strategies take on a very different form when we want them to yield quantitative data.

Descriptive Research Designs

In the next few pages, we describe observation studies, correlational research, developmental designs, and survey research, all of which yield quantitative information that can be summarized through statistical analyses. We devote a significant portion of the chapter to survey research, because this approach is used quite frequently in such diverse disciplines as business, government, public health, sociology, and education.

Observation Studies

In the qualitative studies described in Chapter 6, observations are usually recorded in great detail, perhaps with field notes or videotapes that capture the wide variety of ways in which people or other animal species act and interact. From these data, the researcher constructs a complex yet integrated picture of how certain humans or nonhumans spend their time.

In *quantitative* research, however, an **observation study** is quite different. Perhaps most importantly, an observation study does not necessarily involve members of the animal kingdom. Certainly it might involve humans or other animals. But it might, instead, be aimed at studying plant species, nonliving objects (e.g., rock formations, soil samples), or dynamic physical phenomena (e.g., weather patterns, black holes).

In addition, a quantitative observation study tends to have a particular, prespecified focus. When human beings are the topic of study, the focus is typically on a certain aspect of behavior. Furthermore, the behavior is quantified in some way. In some situations, each occurrence of the behavior is *counted* to determine its overall frequency. In other situations, the behavior is *rated* for accuracy, intensity, maturity, or some other dimension. But regardless of approach, the researcher strives to be *as objective as possible* in assessing the behavior

being studied. To maintain such objectivity, he or she is likely to use strategies such as the following:

- Define the behavior being studied in such a precise, concrete manner that the behavior is easily recognized when it occurs.
- Divide the observation period into small segments and then record whether the behavior does or does not occur during each segment. (Each segment might be 30 seconds, 5 minutes, 15 minutes, or whatever other time span is suitable for the behavior being observed.)
- Use a rating scale to evaluate the behavior in terms of specific dimensions (more about rating scales a bit later in the chapter).
- Have two or three people rate the same behavior independently, without knowledge of one another's ratings.
- Train the rater(s) to use specific criteria when counting or evaluating the behavior, and continue training until consistent ratings are obtained for any single occurrence of the behavior.

A study by Kontos (1999) can give you a flavor for what a researcher might do in an observation study. Kontos's research question was this: What roles do preschool teachers adopt during children's free-play periods? (She asked the question within the context of theoretical issues that are irrelevant to our purposes here.) The study took place during free-play sessions in Head Start classrooms, where 40 preschool teachers wore cordless microphones that transmitted what they said (and what people near them said as well) to a remote audiotape recorder. Each teacher was audiotaped for 15 minutes on each of two different days. Following data collection, the tapes were transcribed and broken into 1-minute segments. Each segment was coded in terms of the primary role the teacher assumed during that time, with five possible roles being identified: *interviewer* (talking with children about issues unrelated to a play activity), *stage manager* (helping children get ready to engage in a play activity), *play enhancer/playmate* (joining a play activity in some way), *safety/behavior monitor* (managing children's behavior), or *uninvolved* (not attending to the children's activities in any manner). Two research assistants were trained in using this coding scheme until they were consistent in their judgments at least 90% of the time, indicating a reasonably high *interrater reliability*. They then independently coded each of the 1-minute segments and discussed any segments on which they disagreed, eventually reaching consensus on all segments. (The researcher found, among other things, that teachers' behaviors were to some degree a function of the activities in which the children were engaging. Her conclusions, like her consideration of theoretical issues, go beyond the scope of this book.)

As should be clear from the preceding example, an observation study involves considerable advance planning, meticulous attention to detail, a great deal of time, and, often, the help of one or more research assistants. Furthermore, a pilot study is essential for ironing out any wrinkles in identifying and classifying the behavior(s) or other characteristic(s) under investigation. Embarking on a full-fledged study without first pilot-testing the methodology can result in many hours of wasted time.

Ultimately, an observation study can yield data that portray much of the richness and complexity of human behavior. In some situations, then, it provides a quantitative alternative to such approaches as ethnographies and grounded theory studies.

Correlational Research

A **correlational study** examines the extent to which differences in one characteristic or variable are related to differences in one or more *other* characteristics or variables. A **correlation** exists if, when one variable increases, another variable either increases or decreases in a somewhat predictable fashion.

In correlational studies, researchers gather data about two or more characteristics for a particular group of people or other appropriate units of study. These data are numbers that reflect specific measurements of the characteristics in question. When human beings are the focus of investigation, the data might be test scores, ratings assigned by an expert observer, or frequencies of certain behaviors. Data in animal studies, too, might be frequencies of

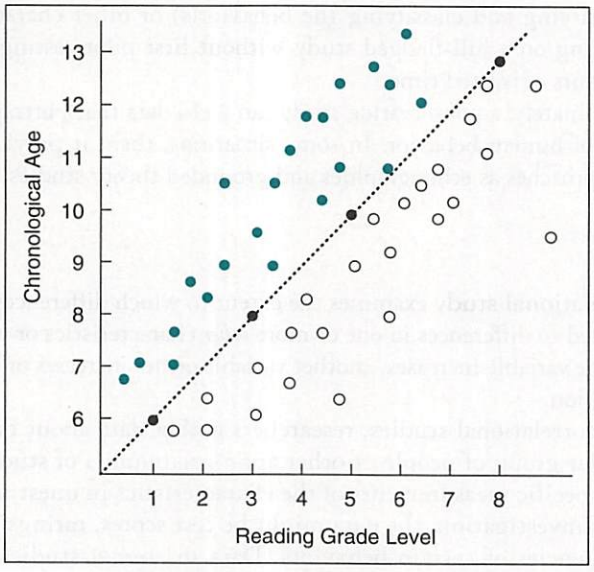
particular behaviors, but alternatively they might be fertility rates, metabolic processes, or measures of health and longevity. Data in studies of plants, inanimate objects, or dynamic physical phenomena might be measures of growth, chemical reactions, density, temperature, or virtually any other characteristic that human measurement instruments can assess with some objectivity. Whatever the nature of the data, at least two different characteristics are measured in order to determine whether and in what way these characteristics are interrelated.

An example of a correlational study may be helpful. As you well know, as children grow older, they become better readers. In other words, there is a *correlation* between age and reading ability. Imagine that a researcher has a sample of 50 children and knows two things about these children: their age and their scores on a reading achievement test (the test scores indicate the approximate "grade level" at which the children are reading). The researcher might plot the data on a **scatter plot** (also known as a *scattergram)* to allow a visual inspection of the relationship between the two variables. Figure 8.1 presents this hypothetical scatter plot. Chronological age is on the vertical axis (the *ordinate)* of the graph, and reading level is on the horizontal axis (the *abscissa)*. Each dot represents a particular child; its placement on the scatter plot indicates both the child's age and his or her reading level.

If age and reading ability were two completely unrelated characteristics, the dots would be scattered all over the graph in a seemingly random manner. When the dots instead form a rough elliptical shape (as the dots in Figure 8.1 do) or perhaps a skinnier sausage shape, then we know that the two characteristics are correlated to some degree. The diagonal line running through the middle of the dots in Figure 8.1—sometimes called the *line of regression*—reflects a hypothetical perfect correlation between age and reading level; if all the dots fell on this line, a child's age would tell us *exactly* what the child's reading level is. In actuality, only four dots—the solid black ones—fall on the line. Some dots lie below the line, showing children whose reading level is, relatively speaking, advanced for their age (these children are designated by hollow black dots). Other dots lie above the line, indicating children who are lagging a bit in reading (these children are designated by solid blue dots).

As we examine the scatter plot, we can say several things about it. First, we can *describe* the homogeneity or heterogeneity of the two variables—the extent to which the children are similar to or different from one another with respect to age and reading level. For instance, if the data were to include only children of ages 6 and 7, we would have greater homogeneity with respect to age than would be the case for a sample of children ages 6 through 13. Second, we can *describe* the degree to which the two variables are intercorrelated, perhaps by computing a statistic known as a *correlation coefficient* (Chapter 11 provides details). But third—and most

FIGURE 8.1
Example of a scatter plot: Correlation between age and reading level



importantly—we can *interpret* these data and give them meaning. For instance, the upward trend of the dots from left to right tells us that as children grow older, their reading level improves. This correlation enables us to use a child's age to estimate—that is, to *predict*—the child's reading level to some degree.

A Caution about Interpreting Correlational Results

In all correlational studies, be alert for faulty logic. When two variables are correlated, researchers sometimes conclude that one of the variables must in some way influence the other. In some instances, such an influence may indeed exist; for example, chronological age—or at least the amount of experience that one's age reflects—almost certainly has a direct bearing on children's mental development, including their reading ability. But ultimately we can never infer a cause-and-effect relationship on the basis of correlation alone. Simply put, *correlation does not, in and of itself, indicate causation.*

Take a logically absurd yet statistically demonstrable example. We could conceivably find a statistical correlation between the number of elephants in Thailand in any given year and the size of the Florida orange crop the same year. The facts may be very clear: As the size of the elephant population increases over time, the Florida orange crop also increases. Yet it is ludicrous to think that because we can show a positive correlation there must therefore be a causal bond at the root of the relationship. There is no connection whatsoever between the elephant population in Thailand and the production of oranges in Florida—at least none that we authors can think of! The correlation is simply a fluke and has no meaning.

In the extreme situation of the elephants–oranges correlation, the faulty logic is readily apparent. Yet we often see similarly faulty reasoning proposed in correlational research reports. For instance, imagine that a researcher finds a correlation between family income level and children's school performance: On average, the lower a child's family income is, the lower the child's academic grade-point-average (GPA) is likely to be. It would be all too easy to draw the conclusion that socioeconomic status directly *affects* (i.e., has a causal influence on) academic achievement. We might think that *because* family paychecks, family living conditions, and so forth are below average, the achievement of the boys and girls of such families is also below par. If a family's economic status could be improved, we conclude, the school achievement of the family's children would also improve.

No, no, no! We *cannot* make an inference about causation on the basis of correlated data alone. It's possible that paycheck size does have an impact on children's grades, but it's equally possible that it does not. Perhaps, instead, an undetermined third variable—maybe parents' education levels or maybe the degree to which family members are victims to society-wide discrimination—influences both the size of the family paycheck and the children's school performance.

If we were to infer that socioeconomic status directly affects academic achievement, not only would we be going far beyond the data we have but we would also have trouble accounting for all of the world's intellectual giants, some of whom have grown up in severe poverty. For example, Robert Burns, a great Scottish poet, had very little formal schooling as a result of his family's poverty. George Washington Carver, a famous American botanist, was born of slaves. The father of Franz Schubert, the Austrian composer, was a peasant, and his mother was a cook; Schubert himself lived in poverty most of his life. The case of Abraham Lincoln, born in a log cabin, walking miles to borrow a book, also discredits the impoverished environment-deprived child notion.

The data may not lie, but the causal conclusions we draw from the data may, at times, be extremely suspect. Nevertheless, a good researcher must not be content to stop at the point of finding a correlational relationship, because *beneath the correlation* lie some potentially quite interesting dynamics. One way to explore these dynamics is through *structural equation modeling (SEM)*, a statistical procedure we describe briefly in Table 11.5 in Chapter 11. Another approach—one that can yield more solid conclusions about cause-and-effect relationships—is to follow up a correlational study with one or more experimental studies (described in Chapter 9) to test various hypotheses about what causes what.

Developmental Designs

Earlier we presented a hypothetical example of how children's ages might correlate with their reading achievement levels. Oftentimes when researchers want to study how a particular characteristic changes as people grow older, they use one of two developmental designs, either a cross-sectional study or a longitudinal study.

In a **cross-sectional study**, people from several different age-groups are sampled and compared. For instance, a developmental psychologist might study the nature of friendships for children at ages 4, 8, 12, and 16. A gerontologist might consider how retired people in their 70s, 80s, and 90s tend to spend their leisure time.

In a **longitudinal study**, a single group of people is followed over the course of several months or years, and data related to the characteristic(s) under investigation are collected at various times.[1] For example, a psycholinguist might examine how children's spoken language changes between 6 months and 5 years of age. Or an educational psychologist might get measures of academic achievement and social adjustment for a group of fourth graders and then, 10 years later, find out which students had completed high school (and what their high school GPAs were) and which ones had not. The educational psychologist might also compute correlations between the measures taken in the fourth grade and the students' high school GPAs; thus, the project would be a correlational study—in this case enabling predictions from Time 1 to Time 2—as well as a longitudinal one.

When longitudinal studies are also correlational studies, they enable researchers to identify potential mediating and moderating variables in correlational relationships. As previously explained in Chapter 2, *mediating variables*—also known as *intervening variables*—may help explain why a characteristic observed at Time 1 is correlated with a characteristic observed at Time 2. Mediating variables are typically measured at some point between Time 1 and Time 2—we might call it Time 1½. In contrast, *moderating variables* influence the nature and strength of a correlational relationship; these might be measured at either Time 1 or Time 1½. A statistical technique mentioned earlier—structural equation modeling (SEM)—can be especially helpful for identifying mediating and moderating variables in a longitudinal study (again we refer you to Table 11.5 in Chapter 11). Yet keep in mind that even with a complex statistical analysis such as SEM, *correlational studies cannot conclusively demonstrate cause-and-effect relationships.*

Obviously, cross-sectional studies are easier and more expedient to conduct than longitudinal studies, because the researcher can collect all the needed data at a single time. In contrast, a researcher who conducts a longitudinal study must collect data over a lengthy period and will almost invariably lose some participants along the way, perhaps because they move to unknown locations or perhaps because they no longer want to participate. An additional disadvantage of a longitudinal design is that when people respond repeatedly to the same measurement instrument, they are likely to improve simply because of their *practice* with the instrument, even if the characteristic being measured hasn't changed at all.

But cross-sectional designs have their disadvantages as well. For one thing, the different age-groups sampled may have been raised under different environmental conditions. For example, imagine that we want to find out whether logical thinking ability improves or declines between the ages of 20 and 70. If we take a cross-sectional approach, we might get samples of 20-year-olds and 70-year-olds and then measure their ability to think logically about various scenarios, perhaps using a standardized multiple-choice test. Now imagine that, in this study, the 20-year-olds obtain higher scores on our logical thinking test than the 70-year-olds. Does this mean that logical thinking ability declines with age? Not necessarily. At least two other possible explanations readily come to mind. The quality of education has changed in many ways over the past few decades, and the younger people have probably had a superior education to that of the older people. And the younger folks have almost certainly had more experience taking multiple-choice tests than the older folks have. Such problems pose threats to the *interval validity*

[1] Some longitudinal studies are conducted over a much shorter time period—perhaps a few minutes or a couple of hours. Such studies, often called *microgenetic studies*, can be useful in studying how children's thinking processes change as a result of short-term, targeted interventions (e.g., Kuhn, 1995).

of this cross-sectional study: We cannot eliminate other possible explanations for the results observed (recall the discussion of internal validity in Chapter 4).

A second disadvantage of a cross-sectional design is that we cannot compute correlations between characteristics at different age levels. Consider, again, the educational psychologist who wants to use students' academic achievement and social adjustment in fourth grade to predict their tendency to complete their high school education. If the educational psychologist were to use a cross-sectional study, there would be different students in each age-group—and only one set of measures for each student—making predictions across time impossible.

To address some of the weaknesses of longitudinal and cross-sectional designs, researchers occasionally combine both approaches in what is known as a **cohort-sequential study**. In particular, a researcher begins with two or more age-groups (this is the cross-sectional piece) and follows each age-group over a period of time (this is the longitudinal piece). As an example, let's return to the issue of how people's logical thinking ability changes over time. Imagine that instead of doing a simple cross-sectional study involving 20-year-olds and 70-year-olds, we begin with a group of 20-year-olds and a group of 65-year-olds. We give them a multiple-choice test designed to assess logical reasoning both at the beginning of the study and then again five years later when they are 25 and 70 years old, respectively. If both groups improve over the five-year time span, we might wonder if practice in taking multiple-choice tests or practice in taking this *particular* test may partly account for the improvement. Alternatively, if the test scores increase for the younger group but decrease for the older group, we might reasonably conclude that logical thinking ability *does* decrease somewhat in the later decades of life.

A cohort-sequential study offers a second advantage, in that, like a longitudinal study, it enables us to calculate correlations between measures taken at two different time periods and therefore to make predictions across time. For instance, we might determine whether people who score highest on the logical thinking test at Time 1 (when they are either 20 or 65 years old) are also those who score highest on the test at Time 2 (when they are either 25 or 70 years old). If we find such a correlation, we can reasonably conclude that logical thinking ability is a relatively stable characteristic—that certain people currently think and will continue to think in a more logical manner than others. We could also add other variables to the study—for instance, determining the extent of participants' postsecondary education or the frequency with which participants engage in activities that require logical reasoning—and determine whether such variables mediate or moderate the long-term stability of logical reasoning ability.

Cross-sectional, longitudinal, and cohort-sequential designs are used in a variety of disciplines, but, as you might guess, they are most commonly seen in developmental research (e.g., studies in child development or gerontology). Should you wish to conduct a developmental study, we urge you to browse in such journals as *Child Development* and *Developmental Psychology* for ideas about specific research strategies.

Survey Research

Some scholars use the term *survey research* to refer to almost *any* form of descriptive, quantitative research. We use a more restricted meaning here: **Survey research** involves acquiring information about one or more groups of people—perhaps about their characteristics, opinions, attitudes, or previous experiences—by asking them questions and tabulating their answers. The ultimate goal is to learn about a large population by surveying a sample of that population; thus, we might call this approach a *descriptive survey* or *normative survey*.

Reduced to its basic elements, a **survey** is quite simple in design: The researcher poses a series of questions to willing participants; summarizes their responses with percentages, frequency counts, or more sophisticated statistical indexes; and then draws inferences about a particular population from the responses of the sample. It is used with more or less sophistication in many areas of human activity—for instance, in a neighborhood petition in support of or against a proposed town ordinance or in a national telephone survey seeking to ascertain people's attitudes about various candidates for political office. This is not to suggest, however, that because of their frequent use, surveys are any less demanding in their design requirements or any easier for the researcher to conduct than other types of research. Quite the contrary, the survey design

makes critical demands on the researcher that, if not carefully respected, can place the entire research effort in jeopardy.

Survey research captures a fleeting moment in time, much as a camera takes a single-frame photograph of an ongoing activity. By drawing conclusions from one transitory collection of data, we may generalize about the state of affairs for a longer time period. But we must never assume that the results can be entered into the Book of Eternal Certainties as ever-abiding Truth. Remember the wisdom of the Greek philosopher Heraclitus: There is nothing permanent but change.

An additional consideration in survey research is that we are relying on *self-report* data: People are telling us what they believe to be true or, perhaps, what they think we want to hear. As noted in the discussion of interviews in Chapter 6, people's memories for events are often distortions of reality—what they think happened isn't always what *did* happen—and people aren't always insightful about their true thoughts and feelings. Furthermore, people's descriptions of their attitudes and opinions are often constructed on the spot—sometimes they haven't really thought about a certain issue until a researcher poses a question about it—and so may be colored by recent events or the current context (Schwarz, 1999). An additional problem is that some participants may intentionally misrepresent the facts—at least, the "facts" as they know them—in order to give the researcher a favorable impression. For example, if we were to ask parents the question "Have you ever abused your children?" the percentage of parents who told us *yes* would be close to zero, and so we would almost certainly underestimate the prevalence of child abuse in our society.

Survey research typically employs a face-to-face interview, a telephone interview, or a written questionnaire. We discuss these techniques briefly here and then offer practical suggestions for conducting them in "Practical Application" sections later on. We describe a fourth approach—using the Internet—in a subsequent "Practical Application" that addresses technology-based methods of data collection.

Face-to-Face and Telephone Interviews

In qualitative research studies, interviews are often quite open-ended, perhaps addressing one or a few central issues but otherwise going in different directions for different participants. In survey research, however, interviews are fairly structured. In a **structured interview**, the researcher asks a standard set of questions and nothing more. In a **semistructured interview**, the research may follow the standard questions with one or more individually tailored questions to get clarification or probe a person's reasoning.

Another difference between qualitative and quantitative studies is the general "feel" of the interview: It tends to be informal and friendly in a qualitative study but more formal and emotionally neutral in a quantitative one. Participants in a qualitative interview may feel as if they're simply engaging in a friendly chat with the researcher, who is typically someone they have come to know and trust. In contrast, participants in survey research are continually aware that, yes, this is an interview and that the temporary relationship they've formed with the researcher will end once the interview is complete. This is not to say, however, that a survey researcher shouldn't strive to establish rapport with participants. Quite the contrary, the researcher is more likely to gain participants' cooperation and encourage them to respond honestly if he or she is likable and friendly and shows a genuine interest in what people have to say.

Face-to-face interviews have the distinct advantage of enabling the researcher to establish rapport with potential participants and therefore gain their cooperation. Thus, such interviews yield the highest **response rates**—the percentages of people agreeing to participate—in survey research. However, the time and expense involved may be prohibitive if the needed interviewees reside in a variety of states, provinces, or countries.

Telephone interviews are less time-consuming and less expensive (they involve only the cost of any long-distance calls), and the researcher has potential access to virtually anyone on the planet who has a landline telephone or cell phone. Although the response rate is not as high as for a face-to-face interview—many people are apt to be busy, annoyed at being bothered, concerned about using costly cell phone minutes, or otherwise not interested in participating—it is considerably higher than for a mailed questionnaire. Unfortunately, the researcher conducting telephone interviews cannot establish the same kind of rapport that is possible in a face-to-face

situation, and the sample will be biased to the extent that people without phones are part of the population about whom the researcher wants to draw inferences.[2]

Whether they are conducted face-to-face or over the telephone, personal interviews allow the researcher to clarify ambiguous answers and, when appropriate, seek follow-up information. Because such interviews take time, however, they may not be practical when large sample sizes are important.

Questionnaires

Paper-and-pencil questionnaires can be sent to a large number of people, including those who live thousands of miles away. Thus, they may save the researcher travel expenses, and postage is typically cheaper than a lengthy long-distance telephone call. The social scientist who collects data with a questionnaire and the physicist who determines the presence of radioactivity with a Geiger counter are at just about the same degree of remoteness from their respective sources of data: Neither sees the source from which the data originate. From the perspective of survey participants, this distance can be an additional advantage: Participants can respond to questions with some assurance that their responses won't come back to haunt them. Thus, they may be more truthful than they would be in a personal interview, especially when addressing sensitive or controversial issues.

Yet questionnaires have their drawbacks as well. Typically, the majority of people who receive questionnaires don't return them—in other words, there may be a low **return rate**—and the people who do return them are not necessarily representative of the originally selected sample. Even when people are willing participants in a questionnaire study, their responses will reflect their reading and writing skills and, perhaps, their misinterpretation of one or more questions. Furthermore, by specifying in advance all of the questions that will be asked—and thereby eliminating other questions that *could* be asked about the issue or phenomenon in question—the researcher is apt to gain only limited, and possibly distorted, information (Dowson & McInerney, 2001).

If questionnaires are to yield useful data, they must be carefully planned, constructed, and distributed. In fact, *any* descriptive study requires careful planning, with close attention to each methodological detail. We now turn to the topic of planning.

Planning for Data Collection in a Descriptive Study

In quantitative research, a descriptive study invariably involves measuring one or more variables in some way. With this point in mind, let's return to a distinction we first made in Chapter 4—the distinction between substantial and insubstantial phenomena. When studying the nature of *substantial phenomena*—phenomena that have physical substance, an obvious basis in the physical world—a researcher can often use measurement instruments that are clearly valid for their purpose. Tape measures, balance scales, oscilloscopes, MRI machines—these instruments are indisputably valid for measuring length, weight, electrical waves, and internal body structures, respectively. Some widely accepted measurement techniques also exist for studying *insubstantial phenomena*—concepts, abilities, and other intangible entities that cannot be pinned down in terms of precise physical qualities. For example, an economist might use Gross Domestic Product statistics as measures of a nation's economic growth, and a psychologist might use the *Stanford-Binet Intelligence Scale* to measure children's general cognitive ability.

Yet many descriptive studies address complex variables—perhaps people's or animals' day-to-day behaviors, or perhaps people's opinions and attitudes about a particular topic—for which no ready-made measurement instruments exist. In their observations, interviews, questionnaires, and so on, descriptive researchers use a variety of strategies to measure complex variables, as you will see in the upcoming Practical Application sections.

[2] Midway between a face-to-face interview and a telephone interview is an interview conducted on the Internet using Skype (www.skype.com) or other video conferencing software. As this tenth edition of the book goes to press, however, people's access to such software is quite limited—and, in our experience, not always dependable—thereby introducing a significant bias into the sample a researcher might get.

PRACTICAL APPLICATION Using Checklists and Rating Scales

Two techniques that facilitate evaluation and quantification of complex phenomena are the checklist and the rating scale. A **checklist** is a list of behaviors or characteristics for which a researcher is looking. The researcher—or in some studies, each participant—simply indicates whether each item on the list is observed, present, or true or, in contrast, is *not* observed, present, or true.

A **rating scale** is more useful when a behavior, attitude, or other phenomenon of interest needs to be evaluated on a continuum of, say, "inadequate" to "excellent," "never" to "always," or "strongly disapprove" to "strongly approve." Rating scales were developed by Rensis Likert in the 1930s to assess people's attitudes; accordingly, they are sometimes called **Likert scales.**[3]

Checklists and rating scales can presumably be used in research related to a wide variety of phenomena, including those involving human beings, nonhuman animals, plants, or inanimate objects (e.g., works of art and literature, geomorphological formations). We illustrate the use of both techniques with a simple example involving human participants. In the late 1970s, park rangers at Rocky Mountain National Park in Colorado were concerned about the heavy summertime traffic traveling up a narrow mountain road to Bear Lake, a popular destination for park visitors. So in the summer of 1978, they provided buses that would shuttle visitors to Bear Lake and back again. This being a radical innovation at the time, the rangers wondered about people's reactions to the buses; if there were strong objections, other solutions to the traffic problem would have to be identified for the following summer.

Park officials asked a sociologist friend of ours to address their research question: How do park visitors feel about the new bus system? The sociologist decided that the best way to approach the problem was to conduct a survey. He and his research assistants waited at the parking lot to which buses returned after their trip to Bear Lake; they randomly selected people who exited the bus and administered the survey. With such a captive audience, the response rate was extremely high: 1,246 of the 1,268 people who were approached agreed to participate in the study, yielding a response rate of 98%.

We present three of the interview questions in Figure 8.2. Based on people's responses, the sociologist concluded that people were solidly in favor of the bus system

FIGURE 8.2

Excerpts from a survey at Rocky Mountain National Park. Item 4 is a *checklist.* Items 5 and 6 are *rating scales.*

From Trahan (1978, Appendix A).

4. Why did you decide to use the bus system?

_____ Forced to; Bear Lake was closed to cars
_____ Thought it was required
_____ Environmental and aesthetic reasons
_____ To save time and/or gas
_____ To avoid or lessen traffic
_____ Easier to park
_____ To receive some park interpretation
_____ Other (specify): _____

5. In general, what is your opinion of public bus use in national parks as an effort to reduce traffic congestion and park problems and help maintain the environmental quality of the park?

Strongly approve	Approve	Neutral	Disapprove	Strongly disapprove

If "disapprove" or "strongly disapprove," why? _____

6. What is your overall reaction to the present Bear Lake bus system?

Very satisfied	Satisfied	Neutral	Dissatisfied	Very dissatisfied

[3]Although we have often heard *Likert* pronounced as "lie-kert," Likert himself pronounced it "lick-ert."

(Trahan, 1978). As a result, it continues to be in operation today, many years after the survey was conducted.

One of us authors was once a member of a dissertation committee for a doctoral student who developed a creative way of presenting a Likert scale to children (Shaklee, 1998). The student was investigating the effects of a particular approach to teaching elementary school science and wanted to determine whether students' beliefs about the nature of school learning—especially learning science—would change as a result of the approach. Both before and after the instructional intervention, she read a series of statements and asked students either to agree or to disagree with them by pointing to one of four faces. The statements and the rating scale that students used to respond to them are presented in Figure 8.3.

Notice that in the rating scale items in the Rocky Mountain National Park survey, park visitors were given the option of responding "Neutral" to each question. In the elementary school study, however, the children always had to answer "yes" or "no." Experts have mixed views about letting respondents remain neutral in interviews and questionnaires. If you use rating scales in your own research, you should consider the implications of letting your respondents straddle the fence by including a "no opinion" or other neutral response, and design your scales accordingly.

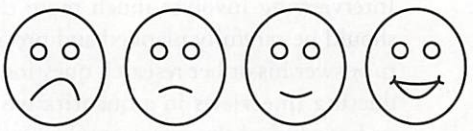
Whenever you use checklists or rating scales, you simplify and more easily quantify people's behaviors or attitudes. In the process, however, you may lose valuable information that clarifies or qualifies people's responses. Ultimately you will have to determine whether the trade-off is worth it for the particular research problem you are investigating.

FIGURE 8.3

Asking elementary school children about science and learning

From *Elementary Children's Epistemological Beliefs and Understandings of Science in the Context of Computer-Mediated Video Conferencing with Scientists* (pp. 132, 134) by J. M. Shaklee, 1998, unpublished doctoral dissertation, University of Northern Colorado, Greeley. Reprinted with permission.

Students responded to each statement by pointing to one of the faces below.



1. No 2. Sort of No 3. Sort of Yes 4. Yes

Students who were unfamiliar with Likert scales practiced the procedure using items A and B; others began with item 1.

A. Are cats green?
B. Is it a nice day?
1. The best thing about science is that most problems have one right answer.
2. If I can't understand something quickly, I keep trying.
3. When I don't understand a new idea, it is best to figure it out on my own.
4. I get confused when books have different information from what I already know.
5. An expert is someone who is born really smart.
6. If scientists try hard enough, they can find the truth to almost everything.
7. Students who do well learn quickly.
8. Getting ahead takes a lot of work.
9. The most important part about being a good student is memorizing the facts.
10. I can believe what I read.
11. Truth never changes.
12. Learning takes a long time.
13. Really smart students don't have to work hard to do well in school.
14. Kids who disagree with teachers are show-offs.
15. Scientists can get to the truth.
16. I try to use information from books and many other places.
17. It is annoying to listen to people who can't make up their minds.
18. Everyone needs to learn how to learn.
19. If I try too hard to understand a problem, I just get confused.
20. Sometimes I just have to accept answers from a teacher even if they don't make sense to me.

PRACTICAL APPLICATION Computerizing Observations

In quantitative research studies, most observations are, of course, quantified in some way, sometimes with simple frequency counts—perhaps using a checklist for guidance—and at other times with rating scales. Either way, you might record your observations on a computer laptop or tablet as you are making them. For example, when using a checklist, you might create a spreadsheet with a small number of columns—one for each item on the checklist—and a row for every entity you will observe. Then, as you conduct your observations, you can enter an "X" or other symbol into the appropriate cell whenever you see an item in the checklist.

For more complex observations, you might create a general *template* document in either a spreadsheet or word processing software and then electronically "save" a separate version of the document for each person, situation, or other entity you are observing. You can either print out these entity-specific documents for handwritten coding during your observations, or, if time and your keyboarding skills allow, you can fill in each document while on-site in the research setting.

You might also look for *peripheral devices*—devices you can hook to your computer to enhance its capabilities—to aid your data collection. For example, Acheson and Gall (2003) have described an approach in which observers use a bar code reader and a special list of bar codes to record different types of behaviors. Each code is associated with a specific type of behavior. When a particular behavior is observed, the bar code reader is swept over the appropriate bar code, and immediately the type and time of the behavior are recorded. In this way, all observations are electronically entered and categorized in a single motion.

PRACTICAL APPLICATION Planning and Conducting Interviews in a Quantitative Study

Interviewing involves much more than just asking questions. The questions for an interview should be carefully planned and precisely worded to yield the kinds of data the researcher needs to answer his or her research question. In the following two sections, we offer guidelines for conducting interviews in a quantitative study and describe how one student successfully planned and conducted the interviews he needed for a research project.

GUIDELINES Conducting Interviews in a Quantitative Study

In Chapter 6 we presented guidelines for conducting interviews in qualitative research. Most of those guidelines are equally applicable in quantitative research, and so we list them again here:

1. Identify questions in advance.
2. Consider how participants' cultural backgrounds might influence their responses.
3. Make sure your interviewees are representative of the group.
4. Find a suitable location.
5. Get written permission.
6. Establish and maintain rapport.
7. Focus on the actual rather than on the abstract or hypothetical.
8. Don't put words in people's mouths.
9. Record responses verbatim.
10. Keep your reactions to yourself.
11. Remember that you are not necessarily getting the facts.

But interviews are typically more structured in quantitative studies than they are in qualitative studies. Therefore, we add several additional guidelines for conducting interviews in quantitative research.

12. *As you write the questions, consider how you can quantify the responses, and modify the questions accordingly.* Remember, you are conducting a *quantitative* study. Thus you will, to some extent,

be coding people's responses as numbers and, quite possibly, conducting statistical analyses on those numbers. You will be able to assign numerical codes to responses more easily if you identify an appropriate coding scheme ahead of time.

13. *Consider asking questions that will elicit qualitative information as well.* You don't necessarily have to quantify *everything*. People's responses to a few open-ended questions may support or provide additional insights into the numerical data you obtain from more structured questions (for example, see the open-ended question in Item 5 of Figure 8.2). By combining quantitative and qualitative data in this manner, you are essentially employing a *mixed-methods design*.

14. *Pilot-test the questions.* When you plan your interview, you will, of course, be trying to develop questions that elicit the kinds of information you are seeking. But despite your best intentions, you may create questions that are ambiguous or misleading or that yield uninterpretable or otherwise useless responses. You can save yourself a great deal of time over the long run if you fine-tune your questions before you begin data collection. You can easily find the weak spots in your questions by asking a few volunteers to answer them in a pilot study.

15. *Restrict each question to a single idea.* Don't try to get too much information in any single question; in doing so, you may get multiple kinds of data—"mixed messages," so to speak—that are difficult to interpret (Gall, Gall, & Borg, 2007).

16. *Save controversial questions for the latter part of the interview.* If you will be touching on sensitive topics (e.g., opinions about gun control, attitudes toward people with diverse sexual orientations), put them near the end of the interview, after you have established rapport and gained the person's trust (Gall et al., 2007).

17. *Seek clarifying information when necessary.* Be alert for responses that are vague or otherwise difficult to interpret. Simple, nonleading questions—for instance, "Can you tell me more about that?"—may yield the additional information you need (Gall et al., 2007, p. 254).

18. *Consider how you might use a computer to streamline the process.* As mentioned in Chapter 6, some computer software programs allow you to record interviews directly onto a laptop computer and then transform these conversations into written text. Alternatively, if interviewees' responses are likely to be short, you might type them directly into a spreadsheet or word processing program.

An Example in International Relations

A student wanted to interview certain United Nations personnel to get their opinions concerning issues related to his study. He planned to go to New York City for a series of interviews and, to conserve both time and expense, wanted to schedule them as tightly as possible. His procedure was organized and logical.

Approximately 6 weeks before going for the interviews, the student wrote the United Nations representatives with whom he wished to confer; he told them when he would be in New York and requested an interview that would last 30 minutes at most. He asked each prospective interviewee for an indication of several time slots when the interview might be scheduled. In his letter, he clearly explained what information he was seeking and why he was seeking it. His reasons were mature and meaningful and were phrased to pique the interest for those he wanted to interview. (*Not* among his reasons was the fact that he was writing a thesis! If you must reveal that you are collecting data for a thesis, use the word *study* instead of *thesis*. Aside from the student and the graduate advisor, theses hold very little glamour in the everyday world. "Studies" are much more acceptable.)

With the letter, the student enclosed a separate sheet containing the questions he intended to ask during the interview, arranged in the order he would ask them. He also suggested that if the interviewee had no objections, he would tape the interview in order to conserve time and lessen the distraction of handwritten notes. He provided a check box on a return postcard for the interviewee to indicate whether he or she had any objection to recording the interview.

After receiving potential interviewees' replies, he set up a master chart of appointments and, by letter, immediately confirmed each interviewee's appointment time and thanked the

interviewee for his or her cooperation. When a time conflict arose, he sought to resolve it by suggesting alternative times that were still open.

Ten days before the scheduled interviews, the student mailed reminders, together with another copy of the interview questions, just in case any interviewees had misplaced the previously sent copies. He also enclosed his full interview schedule so that the interviewees might appreciate the time constraints under which he was working.

The student arrived promptly for each scheduled interview, introduced himself, asked whether the interviewee wanted a copy of the questions he had previously sent, and began with the first question. He tried to guide the interview, always keeping to his agenda of questions and seeking to preserve a relaxed, friendly, yet also professional atmosphere. He wrapped up each interview by thanking the interviewee for the courtesy of giving his or her time. In 3½ days, he interviewed 35 United Nations representatives and had more than four-fifths of his data on tape.

The student transcribed the substance of the interviews and, within 10 days of his visit, sent each interviewee a typed, double-spaced transcript accompanied by a thank-you letter for granting the interview. He asked each individual to read the transcript carefully and, if it was correct, to sign a statement that it was a correct record of the interview. If the person found it inexact or incorrect in any place, he or she could correct the script as desired. In the same mailing, the researcher included a request for permission to use any quotations from the interview in his final report, with the understanding that he would again send the interview content for the interviewee's approval. In his final thesis, the researcher acknowledged his interviewees and noted that they had inspected and approved all of their quoted statements. With the use of such strategies, the researcher and the readers of his report could all be confident that the participants' thoughts and opinions were accurately represented.

In summary, the researcher's use of the following steps led to a highly productive research effort:

1. Set up the interview well in advance.
2. Send the agenda of questions to ask the interviewee.
3. Ask for permission to tape the conference.
4. Confirm the date immediately in writing.
5. Send a reminder, together with another copy of the questions, 10 days before the interview.
6. Be prompt; follow the agenda; offer a copy of the questions in case the original copy has been mislaid.
7. After the interview, submit a transcript of the interview, and get from the interviewee either a written acknowledgment of its accuracy or a corrected copy.
8. After incorporating the material into a semifinal draft of the research report, send that section of the report to the interviewee for final approval and written permission to use the data in the report.

PRACTICAL APPLICATION Constructing and Administering a Questionnaire

Questionnaires seem so simple, yet in our experience they can be tricky to construct and administer. One false step can lead to uninterpretable data or an abysmally low return rate. We have numerous suggestions that can help you make your use of a questionnaire both fruitful and efficient. We have divided our suggestions into three categories: constructing your questionnaire, using technology to facilitate questionnaire administration and data analysis, and maximizing your return rate. In a subsequent Practical Application, we discuss how you might solicit survey participants and collect your data online.

GUIDELINES Constructing Your Questionnaire

Following are 12 guidelines for developing a questionnaire that encourages people to be cooperative and yields responses you can use and interpret. We apologize for the length of the list, but, as we just said, questionnaire construction is a tricky business.

1. *Keep it short.* Your questionnaire should be as brief as possible and solicit only information that is essential to the research effort. You should test every item by two criteria: (a) What do I intend to do with the information I am requesting? and (b) Is it absolutely essential to have this information to solve part of the research problem?

2. *Keep the respondent's task simple and concrete.* Make the instrument as simple to read and respond to as possible. Remember, you are asking for people's *time*, a precious commodity for many people these days. People are more likely to respond to a questionnaire—and to do so quickly—if they perceive it to be quick and easy to complete (McCrea et al., 2008).

Discussion items—those that present open-ended questions and ask people to respond with lengthy answers—are time-consuming and mentally exhausting for both the participants and the researcher. Don't forget that you will have to wrestle with the participants' words to try to determine exactly what their answers mean. The usefulness of responses to discussion items rests entirely on participants' skill to express their thoughts in writing. Those who write in the "Yes/no, and I'll tell you exactly why" style are few and far between. Some respondents may ramble, engaging in discussions that aren't focused or don't answer the questions. Furthermore, after answering 15 to 20 discussion questions, your respondents will think you are demanding a book! Such a major compositional exercise is unfair to those from whom you are requesting a favor.

3. *Provide straightforward, specific instructions.* Communicate exactly how you want people to respond. For instance, don't assume that they are familiar with Likert scales. Some of them may never have seen such scales before.

4. *Use simple, clear, unambiguous language.* Write questions that communicate exactly what you want to know. Avoid terms that your respondents may not understand, such as obscure words or technical jargon. Also avoid words that have imprecise meanings, such as *several* and *usually*.

5. *Give a rationale for any items whose purpose may be unclear.* We cannot say this enough: You are asking people to do you a favor by responding to your questionnaire. Give them a reason to *want* to do the favor. Each question should have a purpose, and in one way or another, you should make that purpose clear.

6. *Check for unwarranted assumptions implicit in your questions.* Consider a very simple question: "How many cigarettes do you smoke each day?" It seems to be a clear and unambiguous question, especially if it is accompanied with certain choices so that all the respondent has to do is to check one of them:

> How many cigarettes do you smoke each day? Check one of the following:
> ___ More than 25 ____ 25–16 ____ 15–11 ____ 10–6 ____ 5–1 ____ none

One underlying assumption here is that a person is likely to be a smoker rather than nonsmoker, which isn't necessarily the case. A second assumption is that a person smokes the same number of cigarettes each day, but for many smokers this assumption isn't viable. At work, when the pressure is on, people may be chain smokers. But on weekends and holidays, they may relax and smoke only one or two cigarettes a day or go without smoking at all. How are the people in this group supposed to answer the question? What box does this type of smoker check?

Had the author of the question considered the assumptions on which the question was predicated, he or she might first have asked questions such as these:

> Do you smoke cigarettes?
> ____ Yes
> ____ No (If you mark "no," skip the next two questions.)
>
> Are your daily smoking habits reasonably consistent; that is, do you smoke about the same number of cigarettes each day?
> ____ Yes
> ____ No (If you mark "no," skip the next question.)

7. *Word your questions in ways that don't give clues about preferred or more desirable responses.* Take another question: "What strategies have you used to try to quit smoking?" By implying that the

respondent has, in fact, tried to quit, it may lead him or her to describe strategies that have never been seriously tried at all.

8. *Determine in advance how you will code the responses.* As you write your questions—perhaps even *before* you write them—develop a plan for recoding participants' responses into numerical data you can statistically analyze. Data processing procedures may also dictate the form a questionnaire should take. If, for example, people's response sheets will be fed into a computer scanner, the questionnaire must be structured differently than if the responses will be tabulated using paper and pencil (we'll say more about computer scanning in the subsequent set of guidelines).

9. *Check for consistency.* When a questionnaire asks questions about a potentially controversial topic, some respondents might give answers that are socially acceptable rather than accurate in order to present a favorable impression. To allow for this possibility, you may wish to ask the same question two or more times—using different words each time—at various points in your questionnaire. For example, take the following two items, appearing in a questionnaire as Items 2 and 30. (Their distance from each other increases the likelihood that a person will answer the second without recalling how he or she answered the first.) Notice how one individual has answered them:

2. Check one of the following choices:
   _X_ In my thinking, I am a liberal.
   ___ In my thinking, I am a conservative.

30. Check one of the following choices:
   ___ I find new ideas stimulating and attractive, and I would find it challenging to be among the first to try them.
   _X_ I subscribe to the position of Alexander Pope:
   "Be not the first by whom the new is tried,
   nor yet the last to lay the old aside."

The two responses are inconsistent. In the first, the respondent claims to be a liberal thinker but later, when given liberal and conservative positions in other forms, indicates a position generally thought to be more conservative than liberal. Such an inconsistency might lead you to question whether the respondent is truly the liberal thinker he or she claims to be.

When developing a questionnaire, researchers sometimes include several items designed to assess essentially the same characteristic. This approach is especially common in studies that involve personality characteristics, motivation, attitudes, and other complex psychological traits. For example, one of us authors once worked with two colleagues to explore factors that might influence the teaching effectiveness of college education majors who were completing their teaching internship year (Middleton, Ormrod, & Abrams, 2007). The research team speculated that one factor potentially affecting teaching effectiveness was willingness to try new teaching techniques and in other ways take reasonable risks in the classroom. The team developed eight items to assess risk taking. Following are four examples, which were interspersed among items designed to assess other characteristics:

	Not at All True		*Somewhat True*		*Very True*
11. I would prefer to teach in a way that is familiar to me rather than trying a teaching strategy that I would have to learn how to do.	1	2	3	4	5
16. I like trying new approaches to teaching, even if I occasionally find they don't work very well.	1	2	3	4	5
39. I would choose to teach something I knew I could do, rather than a topic I haven't taught before.	1	2	3	4	5
51. I sometimes change my plan in the middle of a lesson if I see an opportunity to practice teaching skills I haven't yet mastered.	1	2	3	4	5

Notice how a response of "Very true" to Items 16 and 51 would be indicative of a *high* risk taker, whereas a response of "Very true" to Items 11 and 39 would be indicative of a *low* risk taker. Such counterbalancing of items—some reflecting a high level of a characteristic and others reflecting a low level of the characteristic—can help address some people's general tendency to agree or disagree with a great many statements, including contradictory ones (Nicholls, Orr, Okubo, & Loftus, 2006). A researcher who uses this counterbalancing approach cannot, of course, simply add up a participant's numerical responses for a particular characteristic. For example, for the four risk-taking items just presented, a researcher who wanted high risk takers to have higher scores than low risk takers might give 5 points each for "Very true" responses to the high-risk-taking items (16 and 51) and 5 points each for "Not at all true" responses to the low-risk-taking items (11 and 39). In general, the values of the low-risk-taking items would, during scoring, be opposite to what they are on the questionnaire, with 1s being worth 5 points each, 2s being worth 4 points, 3s being worth 3, 4s being worth 2, and 5s being worth 1. In Appendix A, we describe how to recode participants' responses in precisely this way.

Especially when multiple items are created to assess a single characteristic, a good researcher mathematically determines the degree to which, overall, participants' responses to those items yield consistent results—for instance, the extent to which each person's responses to all "risk-taking" items yield similar results. Essentially, the researcher is determining the *internal consistency reliability* of the set of items. Most statistical software packages can easily compute internal consistency reliability coefficients for you.[4]

Ideally, preliminary data on internal consistency reliability is collected in advance of full-fledged data collection. This point leads us to our next suggestion: Conduct at least one pilot test.

10. *Conduct one or more pilot tests to determine the validity of your questionnaire.* Even experienced researchers conduct test runs of newly designed questionnaires to make sure that the questions are clear and will effectively solicit the desired information. At a minimum, you should give your questionnaire to several friends or colleagues to see whether they have difficulty understanding any items. Have them actually fill out the questionnaire. Better still, ask your pilot-test participants what thoughts run through their minds as they read a question:

> Please read this question out loud. . . . What is this question trying to find out from you? . . . Which answer would you choose as the right answer for you? . . . Can you explain to me why you chose that answer? (Karabenick et al., 2007, p. 143)

Through such strategies you can see the kinds of responses you are likely to get and make sure that in your actual study, the responses you obtain will be of sufficient quality to help you answer your research question.

If your research project will include participants of both genders and various cultural backgrounds, be sure to include a diverse sample in your pilot test(s) as well. Gender and culture *do* play a role in people's responses to certain types of questionnaire items. For instance, some researchers have found a tendency for males to play up their strengths and overrate their abilities, whereas females are apt to ruminate on their weaknesses and *under*rate their abilities (Chipman, 2005; Lundeberg & Mohan, 2009). And people from East Asian cultures are more likely to downplay their abilities than people from Western cultures (Heine, 2007). Keep such differences in mind when asking people to rate themselves on their strengths and weaknesses, and experiment with different wordings that might minimize the effects of gender and culture on participants' responses.

Conducting a pilot study for a questionnaire—and especially asking participants what they are thinking as they read and respond to particular items—is one step toward determining whether a questionnaire has *validity* for its purpose—in other words, whether it truly measures what it is intended to measure. Some academic disciplines (e.g., psychology and related fields) insist that a researcher use more formal and objective strategies to determine a questionnaire's validity, especially when the questionnaire is intended to measure complex psychological traits

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[4]Two common reliability coefficients, known by the researchers who originated them, are the Kuder-Richardson Formula 20 (for either–or responses such as *yes* vs. *no* or *true* vs. *false*) and Cronbach's alpha coefficient (for multinumber rating scales such as the 5-point scale for the risk-taking items).

TABLE 8.1 Guide for the construction of a questionnaire

Write the question in the space below.	*Why are you asking the question? How does it relate to the research problem?*

(personality, motivation, attitudes, etc.). We refer you to the section "Determining the Validity of a Measurement Instrument" in Chapter 4 for a refresher on strategies you might use.

11. *Scrutinize the almost-final product one more time to make sure it addresses your needs.* Item by item, a questionnaire should be quality tested again and again for precision of expression, objectivity, relevance, and probability of favorable reception and return. Have you concentrated on the recipient of the questionnaire, putting yourself in the place of someone who is asked to invest time on your behalf? If you received such a questionnaire from a stranger, what would your honest reaction be? These questions are important and should be answered impartially.

Above all, you should make sure that *every question is essential for you to address the research problem.* Table 8.1 can help you examine your items with this criterion in mind. Using either paper and pencil or appropriate software (e.g., a spreadsheet or the *table* feature in a word processing program), insert each item in the left-hand column and then, in the right-hand column, explain why you need to include it. If you can't explain how an item relates to your research problem, eliminate it!

12. *Make the questionnaire attractive and professional looking.* Your final instrument should have clean lines, crystal-clear printing (and certainly no typos!), and perhaps two or more colors. It should ultimately communicate that its author is a careful, well-organized professional who takes his or her work seriously and has high regard for the research participants.

GUIDELINES Using Technology to Facilitate Questionnaire Administration and Data Analysis

USING TECHNOLOGY

Throughout most of the 20th century, questionnaire-based surveys were almost exclusively paper-and-pencil in nature. But with continuing technological advances and people's increasing computer literacy in recent years, many survey researchers are now turning to technology to share some of the burden of data collection and analysis. Following are several suggestions for using technology to make the use of a questionnaire more efficient and cost-effective:

1. *Use e-mail to request participation and obtain participants' responses.* If the people you wish to survey are a computer-savvy group, have easily obtainable e-mail addresses, and are regularly online, then an e-mail request to participate can be quite appropriate. Furthermore, you can send the survey either within the body of your e-mail message or as an attachment. Participants can respond in a return e-mail message or electronically fill out and return your attachment.

2. *If you use paper mail delivery rather than e-mail, use a word processing program to personalize your correspondence.* Inquiry letters, thank-you letters, and other correspondence can be personalized by using the *merge* function of most word processing programs. This function allows you to combine the information in your database with the documents you wish to send out. For example, when printing the final version of your cover letter, you can include the person's name immediately after the greeting (e.g., "Dear Carlos" or "Dear Mr. Asay")—a simple touch that is likely to yield a higher return rate than letters addressed to "Potential Respondent" or "To whom it may concern." The computer inserts the names for you; you need only tell it where to find the names in your database. The same process is used on every item of junk mail you receive that addresses you personally or that shows your name on a $10,000,000 check (that you may already have won!) and asks you to order magazines. Advertisers have realized the importance of personalization for quite some time. When individuals are addressed by name, they feel special and are more inclined to invest a little of their time.

3. *Use a computer database to keep track of who has responded and who has not.* Computer databases can be readily adapted for use with research involving questionnaires. Information regarding participants' names and addresses, as well as information regarding which materials have been sent and received, can be incorporated into such a database. A search through the database can quickly identify people who have and have not received your request for participation, those who have or have not yet responded, and those who need a first or second reminder letter or e-mail message.

Combining the database with a word processing program can also be helpful. For example, mailing labels can be quickly produced, thus decreasing the amount of time needed to address various mailings to potential participants. Many word processing and spreadsheet programs come with prepared templates for a variety of mailing labels. By identifying the type of label you have for your printer, you can print any or all of the names from your database directly onto the labels.

4. *Use a scanner to facilitate data tabulation.* When you need a large sample to address your research problem adequately, you should consider in advance how you will tabulate the responses after the questionnaires are returned to you. One widely used strategy is to have a computer scan preformatted answer sheets and automatically sort and organize the results. To use this strategy, your questions must each involve a small set of possible answers; for instance, they might be multiple-choice, have yes-or-no answers, or incorporate a 5-point rating scale. You will want the participants to respond using a pencil or dark-colored ink. Enclosing a small number 2 pencil with the questionnaire you send is common courtesy. Furthermore, anything you can do to make participants' task easier—even something as simple as providing the writing implement—will increase your response rate.

5. *When participants are in the same location that you are, administer the questionnaire directly on a computer.* Electronic questionnaires can be highly effective if participants feel comfortable with computers. When participants enter their responses directly onto a computer, you obviously save a great deal of time. Furthermore, when appropriately programmed to do so, a computer can record how *quickly* people respond—information that may in some situations be relevant to your research question.

GUIDELINES Maximizing Your Return Rate for a Questionnaire

As university professors, we authors have sometimes been asked to distribute questionnaires in our classes that relate to some aspect of the university's student services or to students' preferences for the university calendar. The end-of-semester teacher evaluation forms you often fill out are questionnaires as well. Even though participation in such surveys is voluntary, the response rate when one has such a captive audience is typically quite high, often 100%.

Mailing or e-mailing questionnaires to people one doesn't know is quite another matter. Potential respondents have little or nothing to gain by answering and returning the questionnaire, and so many of them don't return it. As a result, the typical return rate for a mailed

questionnaire is 50% or less, and that for an e-mailed questionnaire is even lower (Rogelberg & Luong, 1998; Sheehan, 2001).

We think of one doctoral student who conducted dissertation research in the area of reading. As part of her study, she sent a questionnaire to reading teachers to inquire about their beliefs and attitudes regarding a certain kind of children's literature. Initially, the student sent out 103 questionnaires; 14 teachers completed and returned them (a return rate of 13%). In a second attempt, she sent out 72 questionnaires to a different group of teachers; 12 responded (a return rate of 15%). In one final effort, she sought volunteers on the Internet by using two lists of teachers' e-mail addresses; 57 teachers indicated that they were willing to fill out her questionnaire, and 20 of them actually did so (a return rate of 35%).

Was the student frustrated? Absolutely! Yet she had made a couple of mistakes that undoubtedly thwarted her efforts from the beginning. First, the questionnaire had 36 questions, 18 of which were open-ended ones requiring lengthy written responses. A quick glance would tell any discerning teacher that the questionnaire would take an entire evening to complete. Second, the questionnaires were sent out in the middle of the school year, when teachers were probably already quite busy planning lessons, grading papers, and so on. Even teachers who truly wanted to help this struggling doctoral student (who was a former teacher herself) may simply not have found the time to do it. Fortunately for the student, the questionnaire was only one small part of her study, and she was able to complete her dissertation successfully with the limited (and almost certainly nonrepresentative) sample of responses she received.

Should you decide that a mailed or e-mailed questionnaire is the most suitable approach for answering your research question, the following guidelines can help you increase your return rate:

1. *Consider the timing.* The student just described mailed her questionnaires in the winter and early spring because she wanted to graduate at the end of the summer. The timing of her mailing was convenient for her; however, it was *not* convenient for the people to whom she sent the questionnaire, and her response rate—and her study!—suffered as a result. Consider the characteristics of the sample you are surveying, and try to anticipate when respondents will be most likely to have time to answer a questionnaire. And as a general rule, stay away from peak holiday and vacation times, such as mid-December through early January.

2. *Make a good first impression.* Put yourself in the place of a potential respondent. Imagine a stranger sending you the questionnaire you propose to send. What is your initial impression as you open the envelope or e-mail message? Is the questionnaire inordinately long and time-consuming? Is it cleanly and neatly written? Does it give the impression of relaxation and uncluttered ease? Are the areas for response adequate and clearly indicated? Is the tone courteous, and are the requests reasonable?

3. *Motivate potential respondents.* Give people a reason to *want* to respond. Occasionally, researchers may actually have the resources to pay people for their time or offer other concrete inducements. But more often than not, you will have to rely on the power of persuasion to gain cooperation. Probably the best mechanism for doing so is the cover letter you include with your questionnaire.

One potentially effective strategy is to send a letter soliciting people's cooperation *before* actually sending them the questionnaire. For example, Figure 8.4 shows an example of a letter that a researcher might use to gain people's cooperation in responding to a questionnaire about the quality of a particular academic program. Several aspects of the letter are important to note:

- The letter begins with the name of the sponsoring institution. Ideally, the letter is written on the institution's official letterhead stationery.
- Rather than saying "Dear Sir or Madam," the letter is personalized. Such personalization is easily accomplished with the *mail merge* function of a word processing program.
- The letter describes the potential value of the study, both for the individual and for alumni in general, hence giving the potential responder a reason to *want* to respond.
- The letter assures the individual that his or her cooperation will not place any unreasonable burden—in particular, that the questionnaire will take a maximum of 15 minutes to complete.
- By filling out and sending a simple enclosed postcard (for example, see Figure 8.5)—a quick and easy first step—the researcher gains the individual's commitment to completing

FIGURE 8.4
A letter of inquiry

A B C University
Address

Date

Dear [person's name],

Your alma mater is appealing to you for help. We are not asking for funds, merely for a few minutes of your time.

We know you are proud of your accomplishments at A B C University, and your degree has almost certainly helped you advance your professional aspirations. You can help us maintain—and ideally also improve—your program's reputation by giving us your honest opinion of its strengths and weaknesses while you were here. We have a questionnaire that, with your permission, we would like to send you. It should take at most only fifteen minutes of your time.

Our program is growing, and with your help it can increase not only in size but also in excellence and national prominence. We are confident that you can help us make it the best that it can possibly be.

Enclosed with this letter is a return postcard on which you can indicate your willingness to respond to our questionnaire. Thank you in advance for your kind assistance. And please don't hesitate to contact me at [telephone number] or [e-mail address] if you have any questions or concerns.

Respectfully yours,

Your Signature

Your Name

a lengthier, more complex task in the near future. The postcard should be addressed and stamped for easy return.

- The letter includes two means of communicating with the researcher in case the individual has any reservations about participating in the study.
- The overall tone of the letter is, from beginning to end, courteous and respectful.

Compare the letter in Figure 8.4 with the brief note in Figure 8.6 that was sent to one of us authors and that, unfortunately, is all too typical of students' first attempts at drafting such a letter. A focus only on the researcher's needs in letters of this sort may be another reason for the poor return of questionnaires in some research projects.

The cover letter is extremely important. It should be carefully and thoughtfully composed and should stress the concerns of the recipient rather than any selfish interests of the sender. Some students forget this and, in doing so, unintentionally reveal their own self-centeredness.

FIGURE 8.5
Questionnaire response card

Dear [your name]

☐ Please send the questionnaire; I will be happy to cooperate.

☐ I am sorry, but I do not wish to answer the questionnaire.

Comments:

Date:_____ _____
Name

FIGURE 8.6
A poorly worded request for cooperation

X Y Z UNIVERSITY
Campus Station

Dear Sir:

I am a graduate student at X Y Z University, and the enclosed questionnaire is sent to you in the hope that you will assist me in obtaining information for my master's thesis.

I should appreciate your early reply since I am attempting to get my degree this June.

Yours truly

John Doe
John Doe

4. *If mailing your questionnaire, include a self-addressed envelope with return postage.* To impose on a person's time and spirit of cooperation and then to expect that person also to supply the envelope and pay the postage is unreasonable.

5. *Offer the results of your study.* In return for the investment of time and the courtesy of replying to your questions, offer to send your respondent a summary of your study's results. You might provide a check box, either at the beginning or at the end of your instrument, where a respondent can indicate the desire to have such a summary, together with a place for name and either mailing or e-mailing address. If anonymity is important, a mailed questionnaire might include a separate postcard on which the respondent can request the summary; this postcard should, of course, have a place for the respondent's name and address, along with the suggestion that the card be mailed separately from the questionnaire. For e-mailed questionnaires, a respondent can simply hit the "reply" button twice, once to return the completed questionnaire and a second time (perhaps a few hours later) to request the study's results.

6. *Be gently persistent.* Experts often suggest that when people don't initially respond to a questionnaire, you can increase your response rate by sending two follow-up reminders, perhaps sending each one out a week or two after the previous mailing (e.g., Neuman, 2011; Rogelberg & Luong, 1998). But if the questionnaire is meant to be anonymous, how do you know who has returned it and who has not?

To address this problem, many researchers put a different code number on each copy they send out and keep a list of which number they have sent to each person in their sample. When a questionnaire is returned, they remove the number and person's name from the list. When it is time to send a follow-up letter, they send it only to the people who are still on the list. Researchers should use the list of names and code numbers *only* for this purpose. At no point should they use it to determine who responded in what way to each question—a practice that violates the right to privacy discussed in Chapter 4.

Let's return to the solicitation letter and postcard in Figures 8.4 and 8.5. We have modeled them after a letter and postcard that an American University faculty member successfully used to get alumni feedback about the university's nursing program. After receiving a card that indicated willingness to cooperate, the faculty member immediately mailed the questionnaire. She kept a log of questionnaires mailed, the names and addresses of people to whom they were mailed, and the date of mailing. If a reply was not received within three weeks' time, she sent a reminder letter. The reminder was written in the same tone as the initial letter. An example of such a reminder letter appears in Figure 8.7.

FIGURE 8.7
A follow-up letter

A B C University
Address

Date

Dear [person's name],

We are all very busy these days, and sometimes we have trouble staying on top of our many commitments. Despite our best intentions, we may sometimes overlook something we have said we would do.

Three weeks ago I sent you a questionnaire asking for your input regarding your program at A B C University. To date I have not yet received your completed questionnaire. Perhaps you have simply mislaid it, or perhaps it has been lost in the mail—any one of several reasons might account for its delay in reaching me.

In any event, I am enclosing another copy of the questionnaire, along with another self-addressed, stamped envelope. I am hoping you can find fifteen minutes somewhere in your busy schedule to complete and return the questionnaire. I would really appreciate your personal insights and suggestions regarding your experiences in our program.

Thank you once again for your assistance and generosity in helping us enhance our program. And remember that if you have any questions, you can easily reach me at [telephone number] or [e-mail address].

Respectfully yours,

Your Signature

Your Name

The faculty member's follow-up letter brought results. She was being firm and persuasive, but with considerable skill and tact. Courtesy, understanding, and respect for others pay large dividends in a situation in which a researcher needs others' cooperation. This is especially true in questionnaire studies.

PRACTICAL APPLICATION Using the Internet to Collect Data for a Descriptive Study

In recent years, some researchers have collected descriptive-study data directly on the Internet. For instance, they may put a questionnaire on a website and ask people who visit the site to respond. One site providing links to a wide variety of online research projects is "Psychological Research on the Net."[5] As we write this tenth edition of the book, the site is hosting descriptive research projects on such diverse topics as television commercial effectiveness, gender roles in marriage, cigarette smoking, eating disorders, attitudes and behaviors in the workplace, the psychological impact of automobile commuting, and coping strategies for dealing with stressful life circumstances. The website is maintained by John Krantz, Professor of Psychology at Hanover College, who checks to be sure that each project has been approved by the appropriate internal review board and incorporates informed consent procedures. There is no fee for using the site (J. Krantz, personal communication, May 2003).

Commercial websites for data collection are available as well. Two widely used websites for online surveys are SurveyMonkey (www.surveymonkey.com) and Zoomerang (zoomerang.com).

[5] You can reach the site by going to the website of the Association for Psychological Science (www.psychologicalscience.org); click on "Psychology links," scroll down to "Other Sites of Interest," and then click on "Online Psychology Experiments." Alternatively, you can go directly to the site, which, as this book goes to press, is located at psych.hanover.edu/research/exponnet.html.