

controlled and monitored and, therefore, has high internal validity. Quasi-experimental studies tend to fall somewhere in between; they attempt to mimic the control of true experiments, which helps internal validity, and they tend to take place in applied, real-world situations, which helps external validity.

✓ Learning Check

1. Experimenter bias can threaten both internal and external validity because the results obtained in a study
 - a. may be specific to an experimenter with a certain set of characteristics.
 - b. may be specific to the experimenter who has the expectations.
 - c. may be specific to the cues about how to behave.
 - d. may be specific to the participants' knowledge that they are being measured.
2. The results of a study may be influenced by the fact that a participant knows he or she is being studied. This threat to external validity is
 - a. reactivity.
 - b. novelty.
 - c. experimenter bias.
 - d. volunteerism.

Answers appear at end of chapter.

■ CHAPTER SUMMARY

At this point, you should review the learning objectives presented at the beginning of each section and be sure that you have mastered each objective.

There are five general categories of research strategies: experimental, quasi-experimental, nonexperimental, correlational, and descriptive. The experimental strategy assesses whether there is a causal relationship between two variables. The quasi-experimental strategy attempts to obtain evidence for a causal relationship between two variables, but this strategy cannot unambiguously demonstrate cause and effect. The nonexperimental strategy examines relationships between variables by demonstrating differences between groups or treatment conditions. The correlational strategy determines whether there is a relationship or association between two variables by measuring both variables for each individual. The descriptive strategy assesses the variables being examined as they exist naturally.

Central to selecting a research strategy and design is validity, which is concerned with the truth of the research or the accuracy of the results. Any factor that raises doubts about the research results or the interpretation of the results is a threat to validity. Questions about the validity of research are traditionally grouped into two general categories: external validity and internal validity. A study has external validity if the results of the study can be generalized to people, settings, times, measures, and characteristics other than those in the study. The generality of a study's findings may be a function of virtually any characteristic of the study, including the participants or subjects, the features of the study, and the features of the measures. A research study has internal validity if it produces a single, unambiguous explanation for the relationship between variables. Any factor that allows for an alternative explanation of the

relationship is a threat to the internal validity of the research. Confounding variables are the most common threats to internal validity. Artifacts threaten both internal and external validity.

There tends to be a trade-off between internal and external validity. Research that is very strong with respect to one kind of validity is often relatively weak with respect to the second type. This basic relationship must be considered in planning a research study or evaluating someone else's work. Research strategies also vary in terms of validity. Descriptive, correlational, and nonexperimental studies tend to have high external validity and relatively low internal validity; experimental studies tend to have high internal validity and relatively low external validity. Quasi-experimental studies tend to fall in between these extremes.

KEY WORDS

research strategy	threat to external validity	confounding variable
research design	internal validity	assignment bias
research procedure	threat to internal validity	
external validity	extraneous variable	

EXERCISES

The exercises and engagement activities are identified with specific learning objectives and are intended to assess your mastery of the objectives. You should be aware that exam items are also generated to assess learning objectives.

- In addition to the key words, you should also be able to define each of the following terms:
 - descriptive research strategy
 - linear relationship
 - curvilinear relationship
 - positive relationship
 - negative relationship
 - correlational research strategy
 - experimental research strategy
 - quasi-experimental research strategy
 - nonexperimental research strategy
 - selection bias
 - volunteer bias
 - novelty effect
 - multiple treatment interference
 - sensitization, or assessment sensitization, or pretest sensitization

- individual differences
- time-related variables
- fatigue
- practice
- artifact
- experimenter bias
- single-blind
- double-blind
- demand characteristics
- reactivity
- laboratory
- field

- (LO 1)** For each of the following scenarios, identify which research strategy is used: descriptive, correlational, experimental, or nonexperimental. (Note: For now, do not differentiate between nonexperimental and quasi-experimental studies. The distinction between them is discussed in Chapter 10.)
 - Dr. Jones conducts a study examining the relationship between viewing violent television and aggressive behavior of 5-year-old

- boys. Television preferences are obtained by interviewing each child and aggressive behavior is measured by observing the children during an outdoor play period.
- b. Dr. Jones conducts a study examining the relationship between viewing violent television and aggressive behavior of 5-year-old boys. Television preferences are obtained by interviewing each child. Based on the interview results, the boys are divided into two groups: those who prefer violent television and those who prefer nonviolent television. Then aggressive behavior is measured by observing the children during an outdoor play period to determine if there is any difference between the two groups.
 - c. Dr. Jones conducts a study examining the relationship between viewing violent television and aggressive behavior of 5-year-old boys. A group of boys is randomly separated; half the boys are shown violent television programs for 30 minutes before play time and the other half of the boys are shown nonviolent television programs during the same period. Aggressive behavior is then measured by observing the children during an outdoor play period to determine if there is any difference between the two groups.
 - d. Dr. Jones conducts a study examining aggressive behavior of 5-year-old boys. Each afternoon for 1 week, a group of boys in a child-care center is observed during a 30-minute period while they play outdoors. Aggressive behaviors are recorded during the 30-minute period.
3. **(LO 1)** How is the descriptive strategy different from the other four research strategies?
 4. **(LO 2)** Explain the difference among the terms research strategy, design, and procedure.
 5. **(LO 3)** A researcher conducts a study with 6-year-old children at a summer computer camp for gifted children. However, the researcher suspects that different results would be obtained if the study were conducted with regular 6-year-old children. Does this study have a problem with internal validity or external validity?
 6. **(LO 4)** A researcher finds that college students are more anxious near final exams in December than at the beginning of the semester in September. However, it is not clear whether the anxiety is caused by exams or by the change in season. Does this study have a problem with internal validity or external validity?
 7. **(LO 5)** Explain how using college students as participants in a study may limit the external validity of a study's research findings.
 8. **(LO 5)** What is the novelty effect, and how does it affect a study's external validity?
 9. **(LO 6)** Suppose that you wake up in the morning with all the symptoms of a head cold. You take a cold pill and eat a big bowl of your mother's chicken soup. By midday your cold symptoms are gone, and you are feeling much better. Can you conclude that the chicken soup cured your cold? Explain why or why not.
 10. **(LO 7)** What is the primary threat to internal validity for a study that compares different groups of participants?
 11. **(LO 8)** Describe how experimenter bias can be a threat to internal validity; that is, how can experimenter bias provide an explanation for the scores in one condition being higher than the scores in a second condition?
 12. **(LO 8)** Describe how participant reactivity can be a threat to external validity; that is, how can participant reactivity limit the ability to generalize research results?

ENGAGEMENT ACTIVITIES

13. **(LO5 and 7)** Selection bias and assignment bias are both potential problems dealing with the participants in a study.
 - a. Identify which form of bias is a threat to internal validity and which is a threat to external validity and describe how each one is a threat.