

## Chapter 2

### Research Approaches and Methods of Data Collection

#### Learning Objectives

- Describe the different types of variables used in quantitative research.
- Explain the nature of causation and how researchers establish cause-and-effect relationships.
- Describe the key characteristics of the experimental research approach as used in psychology.
- Describe the advantages and disadvantages of experimental research.
- Describe the different settings in which experimental research is conducted and the advantages and disadvantages associated with each setting.
- Explain the differences between nonexperimental and experimental quantitative research methods.
- Compare and contrast the different kinds of nonexperimental quantitative research.
- Define and explain the goals and characteristics of qualitative research.
- Compare and contrast the six major methods of data collection.

#### Chapter Outline

##### Ways of Categorizing Research Approaches

- Experimental versus descriptive research
  - experimental
    - attempts to identify cause and effect relationships through psychological experiments
  - descriptive
    - focuses on describing phenomena, events, or situations
- Quantitative versus qualitative research
  - quantitative studies – collect numerical data
    - e.g., ratings of attractiveness, number of times a rat presses a bar
  - qualitative studies – collect non-numerical data to answer research questions
    - e.g., pictures, clothing worn, interview statements
  - Creswell (1998) and Patton (1990)
    - quantitative data provides an incomplete analysis of what is being investigated
    - qualitative data adds additional level of understanding

##### Variables in Quantitative Research

- Variable
  - something that takes on different values or categories
  - e.g., gender
- Constant
  - something that cannot vary, a single value or category
  - e.g., male and female
- Categorical versus quantitative variables
  - categorical variables
    - varies by type or kind
    - e.g., gender, religion, college major, method of therapy
  - quantitative variables
    - varies by degree or amount
    - e.g., reaction time, height, age, anxiety level

- Independent versus dependent variables
  - independent variable (IV)
    - presumed to cause changes in another variable
    - variable manipulated by the researcher
    - e.g., therapy vs. no therapy
  - dependent variable (DV)
    - the presumed effect or outcome of the study
    - variable that is measured by the researcher
    - variable that influenced by the IV
- Extraneous variables
  - a variable that competes with the IV in explaining the DV
  - sometimes called third variables or confounding variables
- Mediating and moderating variables
  - mediating variable
    - occurs between two other variables in a causal chain
    - also called intervening variable
    - e.g., anxiety causes distraction (mediating variable), which affects memory
  - moderating variable
    - qualify a causal relationship as dependent on another variable
    - e.g., the impact of anxiety on memory depends on level of fatigue (moderating variable)

#### Causation

- Causation
  - a condition in which one event (the cause) generates another event (the effect)
- Cause and effect
  - definition is different from common use
  - refers to a probabilistic relationship between an IV and a DV
  - attempts to identify what would have happened if IV not administered
- Criteria for identifying a causal relationship
  - cause (IV) must be related to the effect (DV) (relationship condition)
  - changes in IV must precede changes in DV (temporal order condition)
  - no other plausible explanation must exist for the effect

#### The Psychological Experiment

- Zimney (1961, p. 18)
  - “objective observation of phenomena which are made to occur in a strictly controlled situation in which one or more factors are varied and the others are kept constant”
- Definition of the psychological experiment
  - objective observation
    - impartiality and freedom from bias on the part of the investigator
    - Zimney (1961) – three rules for minimizing recording and observation errors
      - accept the possibility that mistakes can occur
      - attempt to identify where the mistakes are likely to occur
      - take the necessary steps to avoid the errors
- Definition of the psychological experiment
  - of phenomenon that are made to occur
    - any publicly observable behavior
    - satisfy the demands of operationalism and replication of experiments

- in a strictly controlled situation in which one or more factors are varied and others are kept constant
  - only variability in experiment is IV
    - no extraneous variables are allowed to threaten study
  - groups must be the same except for the levels of the IV
    - random assignment helps to construct equivalent groups

#### Example of an Experiment and Its Logic

- Convenience sample of 100 people experiencing generalized anxiety
- 50 randomly assigned to each of two groups
- IV = new drug for anxiety
  - Treatment group = new drug in pill form
  - Control group = placebo pill
- DV = measure anxiety levels
- Results
  - participants in the treatment group show lower anxiety after receiving the new drug compared to those who received the placebo pill
- what would you conclude? Is the drug effective?
- Yes, we can conclude there is a causal relationship because:
  - we made objective observations
  - we made the key phenomena occur
  - we varied the IV and held other variables constant
    - random assignment
    - treating the groups the same
- Same example without random assignment
  - same IV = new drug for anxiety
  - same DV = measure anxiety levels
  - let participants self-choose which group they want to be in
    - those who fear medication are more likely to choose to be in the control group
    - those who want treatment and will take medication are more likely to choose to be in the treatment group
  - you have created a confounding variable
- Same example without random assignment
  - confounding variable
    - an extraneous variable that is allowed to vary along with the levels of the IV
  - motivation to take medication has been allowed to vary along with drug treatment (drug vs. placebo)
  - what would you conclude? Is the drug effective?
    - cannot make the same conclusions because you have a confound

#### Advantages of the Experimental Approach

- causal inference – experimental approach is best method for inferring causation
  - causal description refers to identifying the consequences of manipulating an IV
  - causal explanation refers to explaining the mechanisms through which the relationship exists
- ability to manipulate variables
  - only scientific methodology in which variables are manipulated
- control
  - extraneous variables are controlled by:
    - holding them constant
    - using random assignment
    - matching

## Disadvantages of the Experimental Approach

- does not test the effects of nonmanipulated variables
  - many potential independent variables cannot be directly manipulated
  - e.g., people's ages, gender, the weather
- artificiality
  - refers to potential problems in generalizing findings from laboratory settings to the “real world”
- inadequate method of scientific inquiry

## Experimental Research Settings

- Field experiments
  - an experimental research study that is conducted in a real-life setting
    - advantage – may be easier to generalize findings
    - disadvantage – less control of extraneous variables
  - confederate
    - someone working with the experimenter to set up the experimental situation
    - which is not known to the participants
  - Regan and Llamas (2002)
    - wanted to find out if a female shopper's appearance influenced the amount of time it took for an employee of a store to approach and acknowledge her
    - IV= female confederate's dress
      - formal work clothes and grooming
      - informal sports clothes and grooming
    - confederates enter randomly selected women's stores between the hours of 3:00 and 4:00 p.m. on two consecutive Thursdays
    - DV = time it took for an employee to approach and speak to the confederate
      - upon entering the store, the female confederate activated a stopwatch and proceeded down the first open aisle
      - she stopped the stopwatch when an employee approached and spoke to her
- Laboratory Experiments
  - an experimental research study that is conducted in a controlled laboratory setting
    - advantage – more control over extraneous variables
    - disadvantage – less generalization related to artificiality
  - Kassin and Kiechel (1996)
    - wanted to experimentally demonstrate that vulnerable individuals, under the right circumstances, would confess to an act they did not commit and have memory of committing the act
  - Kassin and Kiechel (1996)
    - IV1 = vulnerability of the participant
      - created by having participant complete a task at moderate (control) or fast speed (vulnerable)
    - IV2 = the presence of a person falsely incriminating the participant
    - other controlled variables
      - the presence of a witness and others confirming or refuting the false accusation
    - DV = confession to making a mistake
    - results
      - individuals were more likely to confess to making a mistake they had not made in the vulnerable condition when a confederate, or witness, said that the research participant had made the error
      - these vulnerable individuals were more likely to internalize the false confession and tell others that they had committed the error

## Internet Research

- Advantages
  - access to diverse population
  - bring experiment to participant
  - large sample and thus greater power
  - direct assessment of motivational confounding
  - cost savings
- Disadvantages
  - multiple submissions
  - lack of control
  - self-selection
  - dropout

## Nonexperimental Quantitative Research

- No manipulation of independent variables
- Primary goal
  - to provide an accurate description of a situation or phenomenon, or to describe the size and direction of relationships among variables
- Types
  - correlational study
  - natural manipulation research
  - cross-sectional and longitudinal studies

## Correlational Study

- Measures the degree of relationship between two variables
  - Conrad and Jones (1940)
    - interested in the relationship between IQ scores of parents and IQ scores of their offspring
    - measured each IQ and correlated
- Can be used for prediction
  - examples
    - recidivism for sexual offenders (Hanson & Morton-Bourgon, 2009)
    - relapse in depression (Lethbridge, & Allen, 2008)
    - recovery after mild traumatic brain injury (Stulemeijer, van der Werf, Borm, & Vos, 2008)
- Primary limitation – inability to determine causality
  - third variable problem
    - relationship between two variables is due to a separate, unmeasured, variable
  - path analysis
    - method of testing relationships among variables by seeing how well they fit some theoretical model
      - direct effects – when a variable directly impacts another
      - indirect effects – effect occurs through mediating variable

## Natural Manipulation Research

- Variables of interest are not directly manipulated
  - e.g., a comparison of psychological functioning of people living near twin towers versus farther away
    - IV= distance living from the twin towers (within two miles (near condition) vs. more than 100 miles away (faraway condition))
    - DV = psychological functioning
- Because variables not directly controlled, extraneous variables could be a problem

## Cross-Sectional and Longitudinal Studies

- Cross-sectional studies
  - assess groups of participants at one point in time
    - e.g., comparing IQ scores of several different age groups
    - potential problem – age-cohort effects
- Longitudinal studies
  - assess the same participants over a period of time
    - e.g., measuring changes in IQ for the same participants over several years
    - disadvantages – attrition and cost
- Cohort-sequential studies
  - a combination of cross-sectional and longitudinal designs
  - different age groups are tested longitudinally
  - Chouinard and Roy (2008)
    - interested in the changes that occur in students' academic motivation during adolescence
    - recruited a group of seventh graders and a group of ninth graders and followed them until they completed 9th and 11th grade, respectively

## Qualitative Research

- An interpretive research approach that relies on multiple types of subjective data and investigates people in particular situations in their natural environment (Denzin & Lincoln, 1994)
- Strengths
  - description of individuals with common identity
  - develop theoretical understanding of phenomena
- Weaknesses
  - difficult to generalize findings
  - possible lack of agreement among researchers
  - objective hypothesis testing not used
- Tests
  - commonly used to measure personality, aptitude, achievement, and performance
  - come with information on reliability, validity, and norms
- Strengths of tests
  - can provide measures of many characteristics of people
  - allows comparability of common measures across research populations
  - often standardized and have strong psychometric properties (reliability, validity, and norms)
  - many tests can be administered to groups
  - can provide “hard,” quantitative data
  - ease of data analysis because of quantitative nature of data
- Weaknesses of tests
  - can be expensive
  - reactivity of participants, such as social desirability
  - test might not be appropriate for a local or unique population
  - open-ended questions and probing not available
  - tests are sometimes biased against certain groups of people
  - nonresponse to selected items on the test
  - some tests lack psychometric data

- Questionnaires
  - a self-report data collection instrument that is filled out by research participants
  - strengths of questionnaires
    - good for measuring attitudes and eliciting other content from research participants
    - inexpensive
    - can provide information about participants' subjective perspectives and ways of thinking
    - quick turnaround for group-administered questionnaires
  - strengths of questionnaires
    - perceived anonymity by respondent can be high if situation is carefully controlled
    - moderately high measurement validity for well-constructed and validated questionnaires
    - closed-ended items can provide exact information needed by researcher and ease of data analysis
    - open-ended items can provide detailed information in respondents' own words
    - useful for exploration, as well as hypothesis testing research
  - weaknesses
    - usually must be kept short
    - reactivity of participants, such as social desirability
    - nonresponse to selective items
    - people filling out questionnaires might not recall important information and might lack self-awareness
    - response rate may be low for mail and e-mail questionnaires
    - open-ended items may reflect differences in verbal ability, obscuring the issues of interest
    - data analysis can be time consuming for open-ended items
- Interviews
  - a situation where the interviewer asks the interviewee a series of questions
  - strengths of interviews
    - good for measuring attitudes and most other content of interest
    - allows probing and posing of follow-up questions by the interviewer
    - can provide in-depth information
    - can provide information about participants' subjective perspectives and ways of thinking
  - strengths of interviews
    - closed-ended interviews provide exact information needed by researcher.
    - telephone and e-mail interviews usually provide very quick turnaround.
    - moderately high measurement validity (i.e., high reliability and validity) for well-constructed and well-tested interview protocols.
    - relatively high response rates are often attainable.
    - useful for exploration as well as hypothesis-testing research.
  - weaknesses
    - in-person interviews usually are expensive and time consuming
    - reactivity of participants, such as social desirability
    - investigator effects might occur
    - interviewees might not recall important information and might lack self-awareness
    - perceived anonymity by respondents might be low
    - data analysis can be time consuming for open-ended items
    - measures need validation
- Focus groups
  - a situation where a focus group moderator keeps a small and homogeneous group focused on the discussion of a research topic or issue
    - 6–12 people
    - generally last between 1 and 3 hours
    - recorded using audio and/or videotapes
    - not a group interview

- strengths
  - useful for exploring ideas and concepts
  - provides window into participants’ internal thinking
  - can obtain in-depth information
  - can examine how participants react to each other
  - allows probing
  - most content can be tapped
  - allows quick turnaround
  
- weaknesses
  - sometimes expensive
  - might be difficult to find a focus group moderator with good facilitative and rapport-building skills
  - reactive and investigator effects
  - might be dominated by one or two participants
  - difficult to generalize results if small, unrepresentative samples of participants are used
  - might include large amount of extra or unnecessary information
  - measurement validity might be low
  - usually should not be the only data collection methods used in a study
  - data analysis can be time consuming because of the open-ended nature of the data
  
- Observation
  - naturalistic observation
    - done in real-world settings
  - laboratory observation
    - conducted in a lab or other controlled environment
  - time-interval sampling
    - observing during preselected time intervals
    - e.g., first 5 minutes of each 30-minute time interval
  - event sampling
    - every time that a particular event takes place
  
- Existing or secondary data
  - “data” that were originally left behind or used for some purpose other than the new research study
  - most frequently used existing data
    - documents, physical data, and archived research data
      - archived research data
        - secondary research data that were collected by other researchers for other purposes
  
- Strengths of documents and physical data
  - unobtrusive
  - can be collected for time periods occurring in the past
  - provides background and historical data
  - useful for corroboration
  - grounded in local setting
  - useful for exploration
  
- Strengths of archived research data
  - available on a wide variety of topics
  - inexpensive
  - often are reliable and valid
  - can study trends
  - ease of data analysis
  - often based on high quality or large probability samples
  
- Weaknesses of documents and physical data

- might be incomplete
- might represent only one perspective
- access may be limited
- might not provide insight into participants' personal thinking for physical data
- might not apply to general populations
- Weaknesses of archived research data
  - might not be available for the population of interest
  - might not be available for your research questions
  - data might be dated
  - open-ended or qualitative data usually not available
  - most important findings have already been mined from the data

### Multiple-choice questions

1. What is the main difference between descriptive and experimental research approaches?
  - a. the former always uses qualitative data while the latter always uses quantitative data
  - b. descriptive research is done by social scientists while natural scientists do experimental research
  - c. descriptive research involves manipulating variables but experimental research does not
  - \* d. experimental research is designed to establish cause-and-effect relationships but descriptive research focuses on describing something
  
2. \_\_\_\_\_ studies collect numerical data, while \_\_\_\_\_ studies collect non-numerical data.
  - a. Qualitative; quantitative
  - b. Experimental; descriptive
  - \* c. Quantitative; qualitative
  - d. Quantity ; quality
  
3. Which of the following is an example of data collected in a quantitative research study?
  - a. pictures
  - b. ratings of teacher effectiveness
  - c. reaction time
  - \* d. b and c
  
4. Which of the following is NOT an example of data collected in a quantitative research study?
  - a. number of words a one year old can understand
  - b. parents' ratings of their child's language development
  - c. the number of words a one year old can say
  - \* d. recording of a one year old talking
  
5. Which of the following is an example of a categorical variable?
  - a. reaction time
  - \* b. gender
  - c. age
  - d. height

6. Which of the following is an example of a quantitative variable?

- a. gender
- b. religion
- \* c. College GPA
- d. relationship status

7. The \_\_\_\_\_ variable is the presumed cause of another variable while the \_\_\_\_\_ variable is the presumed effect.

- \* a. independent; dependent
- b. dependent; independent
- c. independent; extraneous
- d. dependent; mediating

8. In a study designed to identify factors involved in helping behavior, a man on a crowded bus clutches his chest and falls to the floor. In one of the conditions of the study the man is clean shaven and wearing a suit; in the other condition he has a scraggly beard and is wearing a dirty t-shirt and jeans. The amount of time it takes for someone to help the man is recorded. In this example the independent variable is

- a. the amount of time it takes someone to help.
- \* b. the appearance of the man.
- c. the participants in the study.
- d. how crowded the bus is.

9. In a study designed to identify factors involved in helping behavior, a man on a crowded bus clutches his chest and falls to the floor. In one of the conditions of the study the man is clean shaven and wearing a suit; in the other condition he has a scraggly beard and is wearing a dirty t-shirt and jeans. The amount of time it takes for someone to help the man is recorded. In this example the dependent variable is

- \* a. the amount of time it takes someone to help.
- b. the appearance of the man.
- c. the participants in the study.
- d. how crowded the bus is.

10. A(n) \_\_\_\_\_ variable is one that can compete with the independent variable in explaining the outcome of the experiment.

- a. independent
- \* b. extraneous
- c. dependent
- d. moderating

11. A researcher is interested in the effects of teaching styles on learning. She randomly assigns students to either a lecture-based class taught at 8:00 a.m. or a discussion-based class taught at 2:00 p.m. Her results reveal that students in the discussion-based class performed better than those in the lecture-based class. In this example the time that the class is taught could be considered a(n) \_\_\_\_\_ variable, making it impossible to establish a causal connection between teaching method and classroom performance.

- a. independent
- b. dependent
- \* c. extraneous
- d. mediating

12. Several recent studies have found that moderate drinkers of alcohol have lowered levels of heart disease risk than non-drinkers. It has been hypothesized that moderate drinking may reduce stress which in turn may lead to a reduction in the risk of heart disease. In this example lowered stress levels would be considered a(n) \_\_\_\_\_ variable.

- a. independent
- b. dependent
- c. extraneous
- \* d. mediating

13. A(n) \_\_\_\_\_ variable specifies how a causal relationship between two variables is different depending on a particular situation or circumstance. For example, if a researcher finds that a new experimental drug is effective in alleviating depression in young adult but not older adults.

- a. mediating
- \* b. moderating
- c. extraneous
- d. independent

14. According to your text there are three conditions for making justified claims of cause and effect. Which of the following is NOT one of these conditions?

- a. the independent and dependent variables must be related
- \* b. the dependent variable must be manipulated by the researcher
- c. the independent variable must precede the dependent variable
- d. no other plausible explanations for the relation between the independent and dependent variables should exist

15. An effect is

- a. a reaction that a person makes
- b. the difference between what you want to happen and what does happen
- c. the difference between what does happen and what you want to happen
- \* d. the difference between what would have happened in the absence of a treatment and what did actually happen with the treatment

16. What does it mean to say that an observation is "objective?"

- a. the observation is empirical
- b. it is done by professional
- c. the observation has an intuitive basis
- \* d. it is unaffected by the observer's personal biases

17. Experimental research, as opposed to nonexperimental research, allows us to make statements about cause-and-effect relationships. Why is this so?

- a. Experimental research involves studying only how two variables covary.
- b. Experimental research uses statistical analysis.
- \* c. In experimental research, we can observe the effects of manipulating variables under controlled conditions.
- d. Experimental research uses objective observations.

18. Which of the following is NOT a defining characteristic of a psychological experiment?

- a. it involves objective observation
- b. variables are manipulated in a highly controlled environment
- \* c. it always takes place in a laboratory
- d. one or more factors are varied while the rest are held constant

19. According to the text, "observations of phenomena that are made to occur" in a psychology experiment, phenomenon refers to

- a. an emotion.
- b. a thought.
- \* c. an observable behavior.
- d. a natural event.

20. Which of the following is NOT a strength of the experimental approach?

- \* a. proving your hypothesis is correct
- b. inferring a causal relationship
- c. manipulating precisely one or more variables
- d. controlling extraneous variables

21. What is the most critical aspect of the experimental method that allows us to make statements about cause and effect based on experimental data?

- a. real-life setting
- b. operationalism
- c. objectivity
- \* d. control

22. As noted in your text, one disadvantage of the experimental approach is the **inability** to:

- a. control extraneous variables
- b. establish cause and effect
- \* c. assess the effects of variables that cannot be manipulated
- d. make objective observations

23. According to your text, what is probably the most commonly cited disadvantage of using laboratory experiments to learn about human behavior?

- \* a. because they tend to be done in highly controlled settings, their results may not be generalizable to the real world
- b. with their mechanistic approach to human behavior, they ignore the participants' thoughts and emotions
- c. operational definitions reduce the abstract concept to a trivial level, making broad interpretations difficult at best
- d. because they tend to use other species, the results are usually irrelevant to human behavior

24. Which of the following would not be considered a field experiment?

- a. effects of computer-based instruction on computing confidence in a teacher training program
- \* b. effects of music on laboratory memory performance among introductory psychology students
- c. effects of self-selected incentives on productivity among auto workers
- d. effects of television violence on playground aggression among kindergarteners.

25. What is the main difference between experimentation done in a field setting and experimentation done in a laboratory?

- a. in field experimentation, variables are not manipulated
- b. in field experimentation, no attempt is made to control extraneous variables
- \* c. in field experimentation, the setting is "real life" and not contrived
- d. in field experimentation, one can study only a small number of people

26. Compared with field research, which of the following is true about laboratory research?

- a. laboratory research achieves greater naturalism
- b. laboratory research allows for greater generalizability of research
- \* c. laboratory research achieves a greater degree of control over extraneous variables
- d. field research does not allow for direct manipulation of variables

27. Field experiments, according to Tunnell (1977), should include:

- a. natural behaviors.
- b. natural settings.
- c. natural treatments.
- \* d. all of the above.

28. An advantage of doing experiments in the laboratory over the field setting is that

- a. participants can be randomly assigned in the lab.
- \* b. more extraneous variables can be held constant in the lab.
- c. variables can be manipulated in the lab.

d. there is no selection bias in the lab.

29. Why might laboratory experiments be criticized as less than valuable and potentially problematic?

- a. they are subjective and that leads to a lack of confidence in results
- \* b. laboratory-based results may not generalize to the "real world"
- c. knowledge gained in a lab is not informative
- d. we can never really understand human behavior

30. An increasing number of researchers are conducting experiments over the Internet because of the advantages it affords. Which of the following is NOT an advantage of using the Internet to conduct an experiment?

- a. ease of access to culturally diverse populations
- b. having access to a large sample of individuals
- c. a tremendous cost savings over other types of experiments
- \* d. there can be multiple submissions to the study by the same person

31. An increasing number of researchers are conducting experiments over the Internet because of the advantages it affords. Which of the following is NOT a disadvantage of using the Internet to conduct an experiment?

- \* a. the experiment is brought to the participant instead of the participant coming to the experiment
- b. there is a less experimental control
- c. there is a greater probability of self-selection
- d. there is a greater probability of dropout of participants

32. Nonexperimental quantitative research is particularly useful for

- \* a. developing hypotheses for new experiments.
- b. deciding which variable causes which effect.
- c. manipulating the IV
- d. controlling relevant environmental variables.

33. What is the primary weakness of a correlational study?

- a. an inability to determine if two variables are associated
- b. we cannot determine the strength of a relationship
- c. correlational studies tend to be artificial
- \* d. we cannot establish cause and effect with a correlational study

34. In chapter 1, we learned that the main objectives of scientific research are description, explanation, prediction, and control. Of all the nonexperimental research techniques studied, correlational research is particularly well suited for which objectives?

- \* a. description and prediction
- b. explanation and control
- c. prediction and control

d. description, explanation, prediction, and control

35. The “third variable” issue refers to

- \* a. the possibility that two variables are correlated because both are caused by a third variable.
- b. the ambiguity introduced when doing more complex research with more than two variables.
- c. not considering “age” as a variable when doing developmental research.
- d. the influence of the IV in quantitative experimental research.

36. The third variable problem refers to

- a. correlations that are not reliable.
- b. correlations that are not valid
- \* c. correlations between two variables that exist only because of their relations with another variable
- d. correlations must include a minimum of three factors to be reliable.

37. Ramon determines that in his neighborhood “amount of ice cream consumed” and “number of violent crimes” are positively correlated -- the more ice cream consumed, the more crimes are committed. He concludes that something in ice cream leads people to commit violent crimes. What has Ramon overlooked?

- \* a. the "third variable" problem as some other variable could lead to an increase in both ice cream consumption and violent crime
- b. the reactive effect as the people in his neighborhood were probably aware that he was observing them, and altered their behavior toward what they thought he wanted to see
- c. his observations are qualitative and therefore inappropriate
- d. he collected his data only after-the-fact

38. If we find that two variables are correlated, which of the following conclusions would be unjustified?

- \* a. we know that changes in one of the variables cause changes in the other
- b. we know that we can predict to some extent the value of one variable if we know the value of the other
- c. we know that the two variables covary, i.e., change in value together
- d. we know that we have quantified a relationship between the two variables

39. Although we cannot establish causality from a correlational study, statistical techniques are available to help clarify relationships. One of these is known as \_\_\_\_\_ and involves identifying multiple variables that are related to a single outcome either directly or indirectly (through mediating variables).

- \* a. path analysis
- b. triangulation
- c. multiple covariance
- d. test of inference

40. You want to conduct a study to determine whether wedding proposals tend occur more frequently during storm-related power outages. What kind of study would you be conducting?

- a. meta-analysis
- b. longitudinal
- \* c. natural manipulation
- d. phenomenological

41. In a longitudinal study of a behavior, a researcher would

- a. select groups of participants from each age group and study each group at one time.
- b. observe and participate in the behavior in question.
- c. measure the degree to which the behavior changed when a factor thought to influence it also changes.
- \* d. study one group of similarly aged people multiple times over a long period of time.

42. A researcher decides to measure the development of moral reasoning from early to late childhood. At a single point in time she tests 20 four-year olds, 20 six-year olds, and 20 eight-year olds by presenting each with the same moral dilemma and recording their responses on a questionnaire. She then compares the performance of the three groups. The researcher is using a type of design referred to as:

- a. longitudinal
- \* b. cross-sectional
- c. cohort-sequential
- d. qualitative

43. Suppose a researcher used a cross-sectional research design and found that older adults tend to be more socially conservative than younger adults. He concludes that as we get older we tend to become more conservative in our thinking. Which of the following is a potential problem with this conclusion?

- a. the researcher cannot establish causation because this is a qualitative study
- b. the problem of attrition has not been addressed
- \* c. an age-cohort effect could explain these findings
- d. The problem of accurately measuring age

44. A research technique that combines features of both longitudinal and cross-sectional designs – testing cohorts of individuals but also retesting them over time – is referred to as a \_\_\_\_\_ design.

- \* a. cross-sequential
- b. qualitative
- c. repeated cross-sectional
- d. grouped longitudinal

45. For his senior thesis, Jacob is studying the development of motor coordination in monkeys from birth to old age, but only has one semester to collect his data. What kind of descriptive research design should he use?

- a. longitudinal
- b. experimental
- \* c. cross sectional
- d. historical

46. Qualitative research can be described in the following way:

- a. it is objective, involves multiple methods, and focuses on people in subcultures
- b. it is opinionated, involves two specific methods, and focuses on cultures, not people
- c. it is emotional, involves historical methods, and focuses on people with odd cultural

practices

- \* d. it is interpretive, involves multiple methods, and focuses on people in their natural environment

47. The cohort-sequential design is an alternative developmental design

- \* a. where different age groups are tested longitudinally
- b. where one age group is tested longitudinally
- c. where different age groups are tested once
- d. where one age group is tested once

48. Qualitative research is interpretive, which involves

- \* a. extracting information from non-numerical data.
- b. using objective measurements.
- c. quantifying non-numerical data.
- d. using only rating scales

49. \_\_\_\_\_ research is primarily descriptive and useful in theory generation while \_\_\_\_\_ research is more useful in testing hypotheses.

- a. Quantitative; qualitative
- \* b. Qualitative; quantitative
- c. Experimental; correlational
- d. Cross-sectional; longitudinal

50. Qualitative researchers use many methods in part to

- a. find one that produces the expected outcome.
- b. make the process more like an experiment.
- \* c. provide a better understanding of the phenomenon being investigated.
- d. verify their quantitative observations.

51. Which of the following could be considered a limitation of qualitative research?

- a. because it is typically conducted in an artificial laboratory setting the findings may not apply to the real world
- b. results from qualitative research are overly objective – not allowing for interpretation of individual participants perspectives
- c. it is not particularly useful for generating theoretical ideas
- \* d. different researchers may provide different interpretations of the same data

52. Focus groups are useful in which of the following types of research?

- a. experimental
- \* b. qualitative
- c. quantitative
- d. correlational

53. \_\_\_\_\_ observation is done in the real world, while \_\_\_\_\_ observation is done in a controlled environment.

- a. Laboratory; naturalistic
- b. Event; time-sampling
- c. Participant; complete
- \* d. Naturalistic; laboratory

54. Which of the following is NOT a weakness of observation as a major method of data collection?

- a. reactivity
- \* b. typically dominated by one participant
- c. can be expensive
- d. data analysis can be time consuming.

55. Which of the following methods of data collection is used to measure personality, aptitude, achievement, or performance?

- a. observation
- b. focus groups
- \* c. tests
- d. secondary data

56. Which of the following is a weakness of using tests at a method of data collection?

- a. expense
- b. reactivity
- c. biased questions
- \* d. all of the above

57. \_\_\_\_\_ are a paper and pencil self report method of collecting attitude and opinion information, while \_\_\_\_\_ are a face to face self report method for collecting the same information.

- \* a. Questionnaires; interviews
- b. Tests; interviews
- c. Interviews; questionnaires
- d. Questionnaires; focus groups

58. Which of the following methods of data collection is subject to reactivity?

- a. questionnaires
- b. interviews
- c. focus groups
- \* d. all of the above

59. Which of the following is a strength of a face to face interview over a paper and pencil questionnaire?

- a. high measurement validity
- b. high reactivity
- \* c. opportunity for clearing up ambiguity in responses
- d. less expensive

60. \_\_\_\_\_ data is data that was left behind by another research or collected for some other purpose.

- a. Primary

- b. Interview
- \* c. Secondary
- d. Observation

61. Tammy decided to explore public health data to find the percentage of individuals who have contracted sexually transmitted diseases (STDs) as part of her thesis on program evaluation of educational materials available to college students on STDs. This is an example of using

- a. correlational data
- b. qualitative data
- c. interview data
- \* d. existing data

### Vocabulary

Define the following in psychological terms:

Experimental research	Descriptive research	Quantitative research study
Numerical data	Qualitative research study	Non-numerical data
Variable	Categorical variable	Quantitative variable
Independent variable	Dependent variable	Cause-and-effect relationship
Extraneous variable	Mediating variable	Moderator variable
Causation	Cause	Effect
Psychological experiment	Manipulation	Confounding variables
Causal description	Causal explanation	Field experiment
Laboratory experiment	Internet experiment	Correlational research
Nonexperimental quantitative research		Third variable problem
Path analysis	Direct effect	Indirect effect
Natural manipulation research		Cross-sectional study
Longitudinal study	Cohort-sequential design	Qualitative research
Triangulation	Method of data collection	Tests
Questionnaire	Interviews	Focus group
Observation	Naturalistic observation	Laboratory observation
Time-interval sampling	Event sampling	Existing or secondary data
Document	Physical data	Archived research data

### Essay questions

- 1) Identify two non-experimental research techniques discussed in your textbook. Describe the major advantages and limitations of each.
- 2) Compare and contrast quantitative and qualitative research. Give an example of each and then give an example of a research study that combines both in one study.
- 3) Describe a simple experiment (do not use one discussed in your text) and identify the independent and dependent variables.
- 4) Define and distinguish mediating and moderating variables.
- 5) Explain the phrase “cause and effect.”
- 6) How does your book define a psychological experiment? Discuss each of the four important components of this definition.

- 7) List and discuss the advantages and disadvantages of the experimental approach.
- 8) One of the advantages of the experimental approach is the ability to control extraneous variables. What are extraneous variables? Describe a simple experiment illustrating how extraneous variables might be controlled. Why is the control of extraneous variables important?
- 9) Experiments are sometimes criticized because they often take place in highly artificial laboratory settings where the experimenter has a lot of control over the environment. Explain why this is actually an advantage in establishing a causal relationship between two variables.
- 10) How does a field experiment differ in practice from naturalistic observation? How does a field experiment differ from a laboratory experiment? What are the strengths and weaknesses associated with field experimentation?
- 11) Compare and contrast laboratory experiments, field experiments and Internet experiments. Include the relative advantages and disadvantages of each.
- 12) What is the distinguishing characteristic of nonexperimental quantitative research? Identify the methods presented in your text as examples of nonexperimental quantitative research.
- 13) What is the third variable problem, and why is it critical to the understanding of the misuse of correlational evidence to imply causation?
- 14) What is natural manipulation research? Explain how natural manipulation research is similar to and different from correlational research.
- 15) Describe a cohort-sequential design and explain how it is a combination of the longitudinal and cross-sectional designs. What advantages does the cohort-sequential design have over the longitudinal and cross-sectional designs?
- 16) What is qualitative research? What are the strengths and limitations of this type of research?
- 17) What are the most commonly used tests in psychological research? What are some strengths and weaknesses of using tests as a method of data collection?
- 18) What is a questionnaire? Give an example question that you might find on a questionnaire. What are some strengths and weaknesses of using questionnaires as a method of data collection?
- 19) How do questionnaires and interviews differ? What are some advantages of interviewing over using a questionnaire?
- 20) What type of research takes advantage of the focus group method of data collection? Describe a basic focus group. What are some strengths and weaknesses of using focus groups as a method of data collection?
- 21) Describe and give an example of the four types of observation.
- 22) Give some examples of existing or secondary data. What are some strengths and weaknesses of using existing or secondary data as a method of data collection?

### Classroom Exercise Suggestions

1) One of the primary goals of this chapter is to provide students with an overview of the many different research approaches and data collection methods available to researchers. Remind students that much of the information contained in the chapter will be explored more fully in other sections of the text. To bring home the point that many topics can be explored in multiple ways, you might use one of the activities below:

- Ask the class to generate ideas of student behaviors that they would be interested in studying (e.g., chatting on Facebook, partying, couples holding hands etc.). Lead the discussion toward a single behavior that could be researched. After a behavior is selected, this should lead to a discussion of operational definitions as you define precisely the behavior that will be studied. This is a good opportunity to point out that many psychological constructs can be operationalized in multiple ways. After the target behavior has been properly defined, have students think of the different research approaches presented in the chapter and how they might use these to study the behavior. Depending on the behavior chosen, students should have no trouble identifying several different methods that could be used. Finally, you should also prompt them to relate each method to an objective of science (description, prediction, etc.) presented in Chapter 1.
- As an alternative to the activity above, you might provide groups of students with a simple hypothesis and ask them to brainstorm ideas of how it could be tested. Providing each group with the same hypothesis will give you (and the other students) an opportunity to discuss the advantages and disadvantages of each suggested multiple research approaches.
- I use one or both of the activities above and then continue to reference them throughout the semester. As we discuss more advanced designs, our original research idea becomes more and more complex.

2) At this point in the semester, it will be difficult for most students to decipher scientific journal articles, but one easy way to help them distinguish different research methods is by utilizing popular media reports of scientific research. This also encourages students to exercise their critical thinking skills – an important goal of the course. There are several ways you might incorporate this in your discussion:

- Have students bring to class popular media reports of scientific research (e.g., from magazines, newspapers, or from online sites like Google news). Ask students to indicate the type of research approach used (e.g., experimental or correlational), the most important results of the study, and any explicit or implied implications of the findings. In many cases, students will find it difficult to determine the type of research design that was used in the original study (e.g., correlational or experimental). They may also find unwarranted implications of causality – for instance, when the original research design was simply correlational.
- Jonathan Mueller maintains a very good Web site containing links to media reports (and often misrepresentations) of scientific research. In many instances, research findings from correlational studies are reported in a way that implies causality. In addition to the article links, this site also includes multiple student activities that would be appropriate to accompany your discussion of this chapter. [http://jonathan.mueller.faculty.noctrl.edu/100/correlation\\_or\\_causation.htm](http://jonathan.mueller.faculty.noctrl.edu/100/correlation_or_causation.htm)
- Finally, Hall and Seery (2006) present an activity in which students compare media reporting of a research finding to the original source. They report that the activity is effective in making students more aware of the limitations of media reporting of research findings.

Hall, S.S. & Seery, B.L. (2006). Behind the facts: Helping students evaluate media reports of psychological research. *Teaching of Psychology*, 33, 101-104.

3) The text points out that correlational research is helpful in accomplishing the scientific objectives of description and prediction. To extend this discussion, you might describe how correlational research often stimulates hypotheses that are tested in an experimental manner – thus establishing causality and accomplishing the objective of explanation. For example, correlational research finding a positive association between playing violent video games and aggressive behavior is difficult to interpret because of issues of direction of effect and potential third variables. However, these findings have stimulated a wealth of experimental research investigating the precise nature of the causal relationship. For the correlational findings below, have students generate ways to test the relationship experimentally. The discussion should naturally lead to issues of random assignment and control of extraneous variables. This may also serve as a preview of ethical issues involved in using random assignment.

- Students who sit at the front of the classroom make better grades than those that sit in the back.
- Researchers have found a positive relationship between the degree of satisfaction couples feel in their relationship and the amount of time they spend together.
- There is a negative relationship between exercise and anxiety.
- Participation in leisure activities has been associated with a lower risk of dementia in older adults.

4) The site below, maintained by Alan Levine, presents simple explanations for five different research methodologies (experimental, correlational, naturalistic observation, surveys, and case studies). The site is well-done and contains summaries and quizzes for each of the five methodologies.

[http://www.mcli.dist.maricopa.edu/proj/res\\_meth/login.html](http://www.mcli.dist.maricopa.edu/proj/res_meth/login.html)

5) This University of Denver site provides links to various online experiments in which students can participate. You may find this to be more appropriate for later in the course.

<http://www.du.edu/psychology/methods/>

6) Simons and Levin (1998) demonstrate change blindness in a field experiment. A video demonstrating the field study can be found at the YouTube link below.

[http://www.youtube.com/watch?v=FWSxSQsspiQ&feature=share&list=UUoUA-CpKaFCCV2Uz\\_qNJZw](http://www.youtube.com/watch?v=FWSxSQsspiQ&feature=share&list=UUoUA-CpKaFCCV2Uz_qNJZw)

Simons, D. J., & Levin, D. T. (1998). Failure to detect changes to people during a real-world interaction. *Psychonomic Bulletin & Review*, 5(4), 644-649. doi:10.3758/BF03208840

7) The Web site Clips for Class ([www.clipsforclass.com](http://www.clipsforclass.com)) has an extensive list of videos for use in many different psychology classes. Under the Research tab there are several videos that could help students in this chapter. They are listed below with descriptions found on the Web site and suggested questions for students after watching each clip.

- Research Methods
  - This video covers the different research methods in psychology: introspection, case studies, survey research, archival research, and experimental research.
  - What is the oldest research method? Why was the method effective? In what ways was it limited? The headless professor mentions archival research in his lesson. What is it? How can it be done on the Internet? Give an example or two. Surveys often provide correlational data. Can experimental research be done on paper? Explain your reasoning.
- Get a Research Method
  - Differences between qualitative and quantitative research are covered in this spoof of the humorous Apple commercials. This student project does mention some limitations of each, but appears to be biased toward qualitative research.

- Using this commercial as your evidence, which research method do you favor—quantitative or qualitative? Why? Evaluate the limitations noted in this short commercial. Which of the limitations is most distressing to you as a researcher? Why?

8) YouTube video explaining research using The Strange Situation developed by Mary Ainsworth. Good demonstration of structured laboratory observation.

<http://www.youtube.com/watch?v=QTsewNrHUUH>

9) The Discovering Psychology series (2001) provides an online viewing of the video “Understanding Research.”

Description from the Web site “This program examines how we know what we know. You'll explore the scientific method, the distinction between fact and theory, and the different ways in which data are collected and applied, both in labs and in real-world settings.”

<http://www.learner.org/series/discoveringpsychology/02/e02expand.html>