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Chapter 2
Research Approaches and Methods of Data Collection

Learning Objectives

2.1 Differentiate among the types of variables used in quantitative research.
2.2 Outline the features of the experimental research approach.
2.3 Summarize the criteria for establishing a cause-and-effect relationship.
2.4 Describe the advantages and limitations of the psychological experiment.
2.5 Summarize how nonexperimental quantitative research can demonstrate relationships among variables.
2.6 Describe the components, strengths, and limitations of qualitative research.
2.7 Explain the different major forms of mixed methods research.
2.8 Compare and contrast the six major methods of data collection.

Chapter Outline

Experimental research- Research based on manipulation to demonstrate cause-and-effect relationships

Manipulation- Researcher actively intervenes in the world by introducing a causal condition

Nonexperimental research - Research that lacks manipulation and studies the world as it naturally occurs

Quantitative research- Empirical research that relies on quantitative data and approaches
- e.g., Ratings of attractiveness, number of times a rat presses a bar

Numerical data- Data consisting of numbers

Qualitative research- Research based on nonnumerical data

Nonnumerical data- Data that consist of pictures, words, statements, clothing, written records or documents, or a description of situations and behavior

- Creswell (1998) and Patton (1990)
  - Quantitative data provides an incomplete analysis of what is being investigated
  - Qualitative data adds an additional level of understanding

Mixed methods research- Research in which quantitative and qualitative data or approaches are combined in a single study or set of related studies

Variables in Quantitative Research

2.1 Differentiate among the types of variables used in quantitative research.

Variable- A characteristic or phenomenon that can vary across or within organisms, situations, or environments
- e.g., Political party (Republican, Democrat, or Independent)

Constant- Something that does not vary
- e.g., Political party (Independent only)

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Table 2.1 Types of Variables Classified by Level of Measurement and by Role of Variable

Variable Type	Key Characteristic	Example
Level of Measurement*		
Categorical variable	A variable that varies by type or kind or categories of a phenomenon.	The variable *political party* is often made up of the categories of Republican, Democrat, and Independent.
Quantitative variable	A variable that varies in amount or degree of a phenomenon.	The variable *reaction time* is often measured in milliseconds and can vary from just a few milliseconds to minutes or longer.
Role Taken by the Variable		
Independent variable (IV)	A variable that is presumed to cause changes to occur in another variable; it's the causal variable.	Amount of anxiety (IV) affects performance on a memory task (DV).
Dependent variable (DV)	A variable that changes because of another variable; it's the effect or outcome variable; it's the variable that measures the effect of the IV.	Amount of anxiety (IV) affects performance on a memory task (DV).
Mediating variable	A variable that operates in between two other variables. It delineates the intervening process through which one variable affects another variable.	Amount of anxiety (IV) affects cognitive distraction (mediating variable), which affects performance on a memory task (DV).
Moderator variable	A variable that specifies how a relationship of interest changes under different conditions or circumstances.	Perhaps the relationship between anxiety (IV) and memory (DV) changes according to the different levels of fatigue (moderator).
Extraneous variable	A variable that can compete with the independent variable in explaining an outcome.	Perhaps an observed relationship between coffee drinking (IV) and heart attacks (DV) is actually due to smoking cigarettes.

*A four-level measurement system will be provided in Chapter 5.

Categorical variable- is a variable that varies by type or kind or categories of a phenomenon

- e.g., Political party, gender, religion, college major, method of therapy

Quantitative variable - variable that varies by degree or amount

- e.g., Reaction time, height, age, anxiety level
- A four level system of classifying variables is introduced in Chapter 5

Role Taken by the Variable

- Independent variable (IV)
  - Variable that is presumed to cause changes in another variable
  - The variable manipulated by the experimenter
  - e.g., "new therapy" vs. "no therapy" control condition.
- Dependent variable (DV)
  - Variable that is presumed to be influenced by one or more independent variables
  - The presumed effect or outcome
- e.g., What are the IV and the DV in the relationship between smoking and lung cancer?
  - IV- smoking, DV- lung cancer
- In experimental research
  - Cause-and-effect relationship - Relationship in which changes in one variable produce changes in another variable
- Extraneous variables
  - A variable that competes with the independent variable in explaining the outcome.
  - Sometimes called third variables and confounding variables
  - e.g., Smoking confounding the relationship between coffee drinking and heart attacks
- Mediating variable (intervening variable)
  - A variable that occurs in-between two other variables in a causal chain.
  - e.g., Smoking →tissue damage→lung cancer.

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- Moderator variable
  - Variable that changes or "moderates" the relationship between an IV and a DV
  - e.g., If behavioral therapy worked better for males and cognitive therapy worked better for females, then gender would be a moderator variable
  - There are many moderator variables working in the natural causal world because our world tends to be quite complex.

Experimental Research

2.2 Outline the features of the experimental research approach.

Experimental research approach
- A quantitative approach
- Designed to discover and demonstrate cause-and-effect relationships
- A benchmark to which other research approaches can be compared regarding causation.
- Key feature - IV manipulated to see changes in the DV
- Scientific vs. practical experimentation
- Free of bias and that have controlled for extraneous variables.

Causation

2.3 Summarize the criteria for establishing a cause-and-effect relationship.

Causation
- A term that people frequently use but don't always carefully consider
- Common sense suggests that causality refers to a condition in which one event generates another event
- Causality is more complex.
- You will see that manipulation is often implicit in the concept of causation
- e.g., Parent punishing a child for coloring on a wall stops the child from coloring on walls

Cause - The factor that makes something else exist or change
- The intuitive definition of cause is too simplistic
- Most causal relationships are dependent on many factors, including contextual factors
  - e.g., Depression can have many causes
- Causal relationships are not fully deterministic but are probabilistic (Shadish, Cook, & Campbell, 2002).
- The causal event may not fully cause the outcome but it increases the probability of the outcome.
- When you want to study cause and effect, your first choice should be to conduct an experiment.

Effect - The difference between what would have happened and what did happen when a treatment is administered
- In an experiment, the difference between treatment and control groups
- The group not receiving the treatment is used as the estimate of what the group that received the treatment would have been like if it had not received the treatment.

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Required Criteria for Making the Claim of Causation

Three required criteria for making a justified claim of cause and effect
1. The researcher has to demonstrate that the independent variable and the dependent variable are related.
2. The researcher must demonstrate that the changes in the independent variable occurred before the changes in the dependent variable.
3. The researcher has to demonstrate that the relationship between the independent and dependent variables is not due to some other variable.

– Example
  - Correlation between coffee drinking and likelihood of having a heart attack.

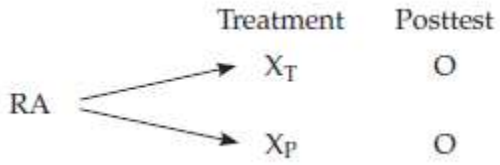
The Psychological Experiment

2.4 Describe the advantages and limitations of the psychological experiment.

The experiment
– Strongest and most powerful way to meet the three required criteria for cause and effect
– Establishes the presence or absence of a relationship by
  - Manipulating an independent variable under controlled conditions
  - Measuring the effect on a dependent variable.

When conducting an experiment
– The psychologist systematically manipulates one or more independent variables
– Objectively observes the dependent variable to see what happens in response
– Observe is all three criterion are met
  - The third required criterion is the most difficult to meet.
  - The researcher must
    - Control the experimental situation
    - Vary only the experimental conditions
    - Equate the groups using random assignment.
    - Make sure that no extraneous variables enter that might threaten the study.

Example of an Experiment and its Logic
– Testing the effectiveness of a new drug that is hypothesized to reduce generalized anxiety



Where
– O denotes observation/measurement of the DV
– X denotes the IV
– Subscript T denotes the treatment condition of the IV (drug with active ingredient)
– Subscript P denotes the placebo condition of the IV (drug with no active ingredient)
– RA stands for random assignment of participants to two groups

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- Convenience or purposive sample of 100 people experiencing generalized anxiety
- Randomly assign them to form two groups with 50 participants in each group.

  - No systematic difference between the groups on any variable, including anxiety level.

- IV- drug treatment vs. placebo drug
- DV- anxiety levels
- Results - the treatment group show lower anxiety after receiving the new drug than those in the control group
- What would you conclude?
  - You would be able to conclude that there is a causal relationship between the IV and DV

We can make this conclusion because

1. We demonstrated the relationship between the independent and dependent variable
2. We ensured that changes in the IV preceded the changes in DV
3. We ruled out alternative explanations by equating the groups at the start of the study

What if we could not use random assignment?

- Some of the participants have a fear of medication
- Most of the participants who feared medication ended up in the treatment condition
- At the end of the study, perhaps the two groups did not differ in anxiety level
- What can you conclude?
  - You would probably conclude that the drug was ineffective
  - The drug might have actually been effective, but the negative effect of fear of medication in the treatment group participants was greater in increasing their anxiety than was the drug's effect in decreasing their anxiety.
- Extraneous variables
  - can destroy the integrity of a research study that claims to show a cause-and-effect relationship
  - might compete with the IV in explaining the outcome.
- Confounding variable- an extraneous variable that if not controlled for will eliminate the researcher's ability to claim that the IV causes changes in the DV
  - e.g., The confounding variable was fear of medication, and made the study appear that the drug had no effect when it really did have some positive effect.

Experimental Research Setting

- Three primary settings for experiments
  - Laboratory experiment- an experiment that is conducted in the controlled environment of a laboratory
    - Greatest control over experimental conditions and extraneous variables
  - Field experiment- an experiment that is conducted in a real-life or natural setting
    - Trade off- experimental control decreases
  - Internet experiment- an experiment that is conducted over the Internet
    - Advantages- access to large diverse populations, access to inaccessible groups, ability to bring the experiment to the participant, high statistical power by access to large populations, cost savings because no lab is needed
    - Disadvantages- multiple submissions, lack of experimental control, self-selection, dropout
  - All research settings include the manipulation of an IV

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Advantages of Experimental Research

1. Causal Inference

– Causal description- description of the consequences of manipulating an independent variable

  - e.g., Lexapro decreases depression shown through causal connection of drug administration and change in symptoms

– Causal explanation- explaining the mechanisms through which a causal relationship operates
  - Identifying the mediating and moderating variables that produce the causal relationship.
  - Identifying a causal descriptive relationship is not sufficient.
  - Practical importance of causal explanation also important

2. Ability to Manipulate Variables

– Experimental research is the only research method in which the researcher is able to actively manipulate one or more independent variables
  - e.g., IV- crowding (low, medium, and high crowding conditions)., DV- social comfort
  - e.g., Could add second IV of group homogeneity

3. Control over Extraneous Variables

– Can be achieved by bringing the experiment into the laboratory

– Achieved by using random assignment and matching

– To equate the groups on all variables except for the independent variable

Disadvantages of the Experimental Approach

1. Does Not Test Effects of Nonmanipulated Variables

– Many independent variables cannot be controlled by an experimenter

– e.g., We cannot deliberately manipulate people's ages,their raw genetic material, gender, the weather, past events, or terrorists' activities.

– To investigate nonmanipulable variables; we must use nonexperimental research designs.

2. Artificiality

– Experiments that are conducted in the laboratory

– Precludes generalization to real-life situations

– May not always apply broadly beyond the lab

– Field experiments and nonexperimental research can help

3. Method of Scientific Inquiry

– Experimental research strongest approach for showing causal description but weaker on causal explanation

– Experimental research is sometimes combined with additional approaches for elucidating causal explanation

– Weak on providing a window into participants' subjective meanings and understandings in their own words and categories

– To overcome criticisms of experimental research, combine experimental research with nonexperimental quantitative, qualitative, and mixed methods approaches

<u>Nonexperimental Quantitative Research</u>

2.5 Summarize how nonexperimental quantitative research can demonstrate relationships among variables.

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- Nonexperimental quantitative research (NQR)- type of quantitative research in which the independent variable is not manipulated by the researcher
  - Traditionally called correlational research
  - Treat the term "correlational research" as a synonym for NQR
  - Goal
    - to provide an accurate description or picture of a particular situation or phenomenon
    - to describe the size and direction of relationships among variables.
  - Can focus on prediction
    - Examples
      - Who will have problems in school so that preventative actions can be made
      - Who will do well on standardized tests for college selection committees
  - More advanced and sophisticated nonexperimental approaches focus on explanation
    - They attempt to identify causal relationships through attempting to establish time ordering of the IV and DV and controlling for extraneous variables
  - Used in combination with qualitative research to identify important variables and the relationships
  - Crucial for investigating variables that cannot be manipulated because it is impractical, impossible, or unethical to manipulate them.
    - e.g., Age, gender, personality, mental health, education, divorce, abuse
- Most basic form of NQR
  - Focuses on description
  - Consists of measuring variables and determining the correlation or degree of relationship that exists
  - Becker, Alzahabi, & Hopwood (2013)
    - Interested in correlates of media multitasking
    - College students who reported greater media multi-tasking also reported higher rates of depression and social anxiety
    - Relationships remained significant after controlling for personality variables

- Multiple variables are used in correlational studies to improve the researcher's ability to make predictions
  - Examples
    - Adolescent alcohol use (Litt & Lewis, 2016)
    - Romantic relationship competence (Tan et al.,2016)
    - Youth relational aggression (Lau, Marsee, Lapre, & Halmos, 2016)
    - Suicide (Galynker et al., 2017)
- Major weakness of the NQR/correlational approach is present when someone assumes that simply because two variables are related that one variable causes the other variable
- Cannot claim causation unless all three criteria in Table 2.2 are realized, and this is very difficult in NQR/correlational research
- "A simple correlation (based on nonexperimental data) does not indicate causation!"

Fun example

- Did you know that there is a relationship between the number of fire trucks responding to a fire and the amount of fire damage?
- As the number of fire trucks increases, so does the amount of fire damage.
- Should we conclude that increasing the number of fire trucks causes increased fire damage? No!
- There is a third variable (i.e., an extraneous variable) operating here: It is the size of fire.
- As the size of fire increases, so does the number of fire trucks

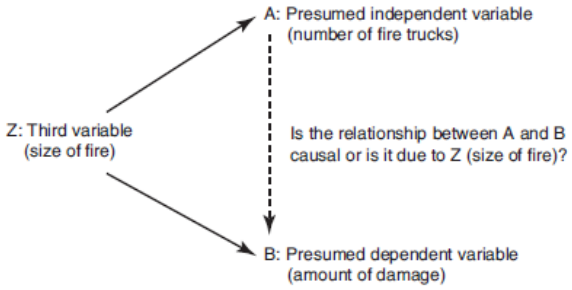
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– It is the size of the fire that is actually causing the amount of fire damage not the number of trucks

Third variable problem- occurs when observed relationship between two variables is actually due to a confounding extraneous variable.

Figure 2.1 Illustration of the third variable problem in correlations.



One more example

- Tea drinking is correlated with lung cancer.
- People who drink more tea are less likely to get lung cancer.
- Is it the tea that is preventing lung cancer? No.
- Tea drinkers have a lower risk for lung cancer because they smoke less.
- It is very important to remember that you cannot conclude that two variables are causally related when all you know is that the variables are correlated.
- Relationship is not enough evidence.
- If you want to study causation, the best way is to use an experiment with random assignment to the groups.

Advantages and Disadvantages of Nonexperimental Quantitative Research

- Advantages
  - NQR can be used to describe relationships in the world and make predictions
  - Advanced types of NQR can be used to probe causation when manipulation of the independent variable
    - Is not possible, e.g.- manipulating someone's age
    - Is not ethically acceptable, e.g.- assigning adolescents to a smoking and nonsmoking condition
  - Most NQR/correlational research is not artificial and based on data as they naturally occur in the world which can lead to greater generalizability
  - NQR is sometimes easier to conduct with large samples of participants that are randomly selected from the target population
- Disadvantages
  - Criteria 2 and 3 are very difficult to achieve without advanced designs because NQR lacks
    - Manipulation of an independent variable
    - Full control for extraneous variables based on random assignment

Qualitative Research

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2.6 Describe the components, strengths, and limitations of qualitative research.

Qualitative research is an interpretive research approach that relies on multiple types of subjective data and investigates people in particular situations in their natural environment (Denzin & Lincoln, 2017).

- Three components
  - Qualitative research is interpretive
    - Qualitative data consist of words, pictures, clothing, documents, or other nonnumerical information.
    - The researcher continually attempts to understand the data from the participants' subjective perspectives
    - Most important task of the qualitative researcher is to understand the insiders' views
    - The researcher also takes the role of "objective outsider" and relates the interpretive–subjective data to the research purpose and research questions
    - The research questions and design are allowed to evolve, or possibly change, during the study because qualitative research is usually focused on exploring phenomena
    - Tends to be most useful for understanding and describing local situations and for theory generation
    - Schouten & McAlexander, 1995
      - Participant observers of the subculture of consumerism associated with Harley-Davidson motorcycles.
      - Interpreted as conveying a sense "of power, fearsomeness, and invulnerability to the rider" (p. 54)
  - Qualitative research is multimethod
    - Individual's account of a personal experience
    - Introspective analysis
    - An individual's life story
    - Interviews with an individual
    - Observation of an individual or individuals
    - Written documents, photographs, and historical information
    - Triangulation- use of multiple data sources, research methods, investigators, and/or theories/ perspectives to cross-check and corroborate research data and conclusions
    - Schouten and McAlexander (1995) collected their data from formal and informal interviews, observations, and photographs of the Harley-Davidson bikers.
  - Qualitative research is conducted in the field or in the person's natural setting and surroundings
    - e.g., A school classroom, the playground, a board meeting, or a therapy setting.
    - Schouten and McAlexander (1995) attended rallies of the Harley Owners Group (HOG), as well as biker swap meets and certain club meetings

Strengths of qualitative research

- The rich description and understanding of individuals and groups of individuals with a common identity.
- Providing data from which researchers can generate and develop theoretical understandings of phenomena
- Useful for the "logic of discovery" defined in the last chapter.
- An excellent approach to explore new phenomena or to look at existing phenomena in new ways.
- Excellent in describing in rich detail particular contexts, places, people, and groups.
  - During the past two decades, we have witnessed an increase in research that makes use of qualitative data
  - Organizational management, social psychology, health care, and education (Denzin & Lincoln, 2017; Goncalves, Rey-Marti, Roig-Tierno, & Miles, 2016; Shelton, Griffith, & Kegler, 2017)

Weaknesses of qualitative research

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- Is that it is difficult to generalize because the data are typically (but not always) based on local, particularistic data.
- Different qualitative researchers might provide very conflicting interpretations of the phenomena studied.
- Objective hypothesis testing procedures are not used.

Mixed Methods Research

2.7 Explain the different major forms of mixed methods research.

Mixed Methods Research- combining quantitative and qualitative research
Three styles of mixed methods research (MMR)

- Quantitatively driven MMR
  - A primarily quantitative research study where some supplemental qualitative data are collected to add additional understanding
  - Primary goals are still causation and generalization.
  - Interview and observational qualitative data are often added to provide contextual understanding of quantitative relationships seen in the quantitative data.
  - Qualitative data can indicate important variables that were overlooked, and provide some understanding of the complexity of the relationship.
  - The most popular form of MMR in psychology
- Qualitatively driven MMR
  - A primarily qualitative research study where some supplemental quantitative data are added for increased understanding of the particular phenomenon or group.
  - Used by psychologists that conduct qualitative research but also understand that collecting some quantitative data can be helpful even in a qualitative study
- Equal-status or integrative MMR
  - The goal is to capitalize on the strengths and weaknesses of both quantitative and qualitative research
  - Examples
    - A study that is trying to develop a general theory that can be adjusted to local contexts
    - A study that simply wants to understand the qualitative (subjective, intersubjective) and quantitative (objective) characteristics of a phenomenon (e.g., how to practice clinical psychology with individual patients)

Major Methods of Data Collection

2.8 Compare and contrast the six major methods of data collection.

Methods of data collection - technique for physically obtaining the data to be analyzed in a research study

Six major methods of data collection

1. Tests- standardized or researcher constructed data collection instruments designed to measure personality, aptitude, achievement, and performance

– Many tests are standardized and come with information on their reliability, validity, and norms for comparison

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Table 2.3 Strengths and Weaknesses of Tests

Strengths of tests (especially standardized tests)
• Can provide measures of many characteristics of people.
• Often standardized (i.e., the same stimulus is provided to all participants).
• Allows comparability of common measures across research populations.
• Strong psychometric properties (high measurement reliability and validity).
• Availability of reference group data.
• Many tests can be administered to groups, this saves time.
• Can provide "hard," quantitative data.
• Tests are usually already developed.
• A wide range of tests is available.
• Response rate is high for group-administered tests.
• Ease of data analysis because of quantitative nature of data.
Weaknesses of tests (especially standardized tests)
• Can be expensive if test must be purchased for each research participant.
• Reactive participant effects such as social desirability can occur.
• 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 evidence of reliability and validity.

- As a general rule, you should not construct a new test if one is already available.
- The best source of information about the tests is the published psychological research literature
- Useful source of tests and measures is The Directory of Unpublished Experimental Mental Measures (2008)
- Researchers must sometimes develop a new test to measure the specific knowledge, skills, behavior, or cognitive activity

2. Questionnaire - self-report data collection instrument completed by research participants
   - Measure participants' opinions and perceptions and provide self reported demographic information.
   - Can be paper-and-pencil instruments or internet based
   - Can include closed-ended items and open-ended items

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Table 2.4 Strengths and Weaknesses of Questionnaires

Strengths of questionnaires
• Good for measuring attitudes and eliciting other content from research participants.
• Inexpensive (especially mail questionnaires, Internet, and group-administered questionnaires).
• Can provide information about participants' subjective perspectives and ways of thinking.
• Can administer to probability samples.
• Quick turnaround for group-administered questionnaires.
• Perceived anonymity by respondent can be high if situation is carefully controlled.
• Moderately high measurement validity (i.e., high reliability and validity) for well-constructed and validated questionnaires.
• Closed-ended items can provide exact information needed by researcher.
• Open-ended items can provide detailed information in respondents' own words.
• Ease of data analysis for closed-ended items.
• Useful for exploration as well as hypothesis-testing research.
Weaknesses of questionnaires
• Usually must be kept short.
• Reactive effects might occur (e.g., respondents might try to show only what is socially desirable).
• 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.
• Measures need validation.

3. Interview- data collection method in which an interviewer asks the interviewee a series of questions, often with prompting for additional information
   - Conducted in face-to-face situations, over the telephone, or electronically over the Internet
   - Can be asynchronous or synchronous

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Table 2.5 Strengths and Weaknesses of Interviews

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. • 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. • Can use with probability samples. • Relatively high response rates are often attainable. • Useful for exploration as well as hypothesis-testing research.
Weaknesses of interviews
• In-person interviews usually are expensive and time consuming. • Reactive effects (e.g., interviewees might try to show only what is socially desirable). • Investigator effects might occur (e.g., untrained interviewers might distort data because of personal biases and poor interviewing skills). • 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.

4. Focus group- collection of data in a group situation where a moderator leads a discussion with a small group of people

- A small and homogeneous group (of 6–12 people)
- Focused on the discussion of a topic or issue.
- Sessions generally last between 1 and 3 hours
- Recorded using audio and/or videotapes.
- Should not be viewed as a group interview because the emphasis is on small-group interaction and in-depth discussion among the participants about the issues being studied.
- Especially useful for exploring ideas and obtaining in-depth information about how people think about an issue.

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Table 2.6 Strengths and Weaknesses of Focus Groups

Strengths of focus groups
• 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 of focus groups
• Sometimes expensive. • Might be difficult to find a focus group moderator with good facilitative and rapport-building skills. • Reactive and investigator effects might occur if participants feel they are being watched or studied. • 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 method used in a study. • Data analysis can be time consuming because of the open-ended nature of the data.

5. Observation- researcher watches and records events or behavioral patterns of people

- It is important to collect observational data (in addition to attitudinal data) because what people say is not always what they do!
- Naturalistic observation- observations done in real-world settings.
- Laboratory observation – observations conducted in a lab or other controlled environment set up by the researcher.
- Quantitative Research Observation
  - Time-interval sampling - observations are recorded during preselected time intervals
  - Event sampling- observations are recorded every time a particular event occurs
- Qualitative Research Observations
    - Complete observer - the researcher observes from the "outside" and, if the setting is a public one, the researcher does not inform the participants that he or she is studying them.

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- Observer-as-participant - the researcher spends a limited amount of time "inside" the situation and obtains informed consent to observe the participants for a research study.
- Participant-as-observer - the researcher spends extensive time "inside" the group or situation and always informs the participants that they are being studied and obtains informed consent.
- Complete participant - the researcher becomes a full participating member of the group. In most cases, the group must be informed and permission granted.

– Things to remember
1. Make sure all observers are well trained.
2. Be sensitive to your appearance and how people being observed react to you.
3. Establish rapport, but do not promise anything you cannot deliver.
4. Be reflexive, unobtrusive, empathetic, and alert at all times.
5. Find an effective way to record what is observed (e.g., note taking, tape recordings).
6. Try to validate and corroborate what you think you are seeing.
7. Make observations in multiple settings.
8. Spend enough time in the "field" to obtain sufficient information.

Table 2.7 Strengths and Weaknesses of Observational Data

Strengths of observational data
• Allows one to directly see what people do without having to rely on what they say they do.
• Provides firsthand experience, especially if the observer participates in activities.
• Can provide relatively objective measurement of behavior (especially for standardized observations).
• Observer can determine what does *not* occur.
• Excellent way to discover what is occurring in a setting.
• Helps in understanding importance of contextual factors.
• Can be used with participants with weak verbal skills.
• Might provide information on things people would otherwise be unwilling to talk about.
• Observer might move beyond selective perceptions of participants in the setting.
• Good for description.
• Provides moderate degree of realism (when done outside of the laboratory).
Weaknesses of observational data
• Reasons for observed behavior might be unclear.
• Reactive effects might occur when respondents know they are being observed (e.g., people being observed might behave in atypical ways).
• Investigator effects (e.g., personal biases and selective perception of observers).
• Observer might "go native" (i.e., overidentifying with the group being studied).
• Sampling of observed people and settings might be limited.
• Cannot observe large or dispersed populations.
• Some settings and content of interest cannot be observed.
• Collection of unimportant material might be moderately high.
• More expensive to conduct than questionnaires and tests.
• Data analysis can be time consuming.

6. Existing or Secondary Data- collection of data that were left behind or originally used for something different than the current research study

– Documents- personal and official documents that were left behind
  - e.g., Letters, diaries, family pictures, official documents

– Physical data- any material thing created or left behind by humans that might provide clues to some event or phenomenon

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- e.g., The contents of someone's trash, wear on the tiles in museums, wear on library books, and soil and DNA on clothes

– Archived research data- data (usually quantitative) originally used for a different research project and stored in a way that others can use it
  - e.g., The Interuniversity Consortium for Political and Social Research (ICPSR)

Table 2.8 Strengths and Weaknesses of Existing Data

Strengths of documents and physical data
• Can provide insight into what people think and what they do. • Unobtrusive, making reactive and investigator effects very unlikely. • Can be collected for time periods occurring in the past (e.g., historical data). • Provides useful background and historical data on people, groups, and organizations. • Useful for corroboration. • Grounded in local setting. • Useful for exploration.
Strengths of archived research data
• Archived research data are available on a wide variety of topics. • Inexpensive. • Often are reliable and valid (high measurement validity). • 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 be representative only of one perspective. • Access to some types of content is 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 to you. • Might not be available for the research questions of interest to you. • Data might be dated. • Open-ended or qualitative data usually not available. • Many of the most important findings have already been mined from the data.

Multiple-choice questions

1. What is the main difference between experimental and nonexperimental research approaches?

a. the former always uses qualitative data while the latter always uses quantitative data
b. nonexperimental research is done by social scientists while natural scientists do experimental research

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c. nonexperimental research involves manipulating variables but experimental research does not
*d. experimental research is designed to establish cause-and-effect relationships but nonexperimental research focuses on describing something

2. _____ is when a researcher actively intervenes in the world by introducing a causal condition.

a. Qualitative
*b. Manipulation
c. Quantitative
d. Numerical

3. _____ studies collect numerical data, while _____ studies collect non-numerical data.

a. Qualitative; quantitative
b. Experimental; nonexperimental
*c. Quantitative; qualitative
d. Quantity ; quality

4. 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

5. 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

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

a. reaction time
*b. gender
c. age
d. height

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

a. gender
b. religion
*c. college GPA
d. relationship status

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8. According to Creswell (1998) and Patton (1990) which of the following is true?

a. Quantitative data provides an incomplete analysis of what is being investigated.
b. Researchers should choose to use either quantitative or qualitative data
c. Qualitative data adds an additional level of understanding
*d. a and c

9. _____ is research in which quantitative and qualitative data and approaches are combined in a single study.

a. Multiple method
*b. Mixed method
c. Multi method
d. Variable method

10. Dr. Smarsh wants to find out how many students on his campus are affiliated with different spiritual/religious groups. He sends out a survey to students through their email and has them report this information. Which of the following describes the type of information Dr. Smarsh is asking for from students?

a. manipulation
b. constant
c. method
*d. variable

11. Dr. Johnson wants to investigate eating disorders in teenage girls. She is only recruiting girls age 13-19 years. In this example, gender is a _____.

a. variable
*b. constant
c. manipulation
d. method

12. 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

13. 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.

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d. how crowded the bus is.

14. 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.

15. 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

16. 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

17. A(n) _____ variable occurs in between two other variables in a causal chain.

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

18. A(n) _____ variable changes the relationship between the IV and DV.

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

19. 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)

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_____ variable.

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

20. 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

21. A(n) _____ variable is a variable that varies by type or kind.

a. quantitative
b. dependent
*c. categorical
d. mediating

22. A(n) _____ variable is a variable that varies by degree or amount.

*a. quantitative
b. dependent
c. categorical
d. mediating

23. Dr. Bassett includes a question on one of her Qualtrics surveys that asks college students to report their college major. Which type of variable is college major?

a. quantitative
b. dependent
*c. categorical
d. mediating

24. Dr. Harper is interested in anxiety as it relates to college life. She has students complete a 10 item standardized measure of anxiety and also asks them questions related to their life while completing college. Which type of variable is anxiety level?

*a. quantitative
b. dependent
c. categorical
d. mediating

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25. 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

26. 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

27. A cause is

*a. a factor that makes something else exist or change.
b. fully determined by correlation.
c. determined by change in the dependent variable.
d. fully deterministic not probabilistic.

28. Mary has determined that height and weight are related to each other. On average taller individuals weight more. Which of the criteria for making the claim of causation does this confirm?

*a. Criterion 1
b. Criterion 2
c. Criterion 3
d. none of the criteria

29. Bob has determined that lightning precedes (comes before) thunder. Which of the criteria for making the claim of causation does this confirm?

a. Criterion 1
*b. Criterion 2
c. Criterion 3
d. none of the criteria

30. Which of the following research designs is the most powerful and strongest way to meet the three criteria to establish cause and effect?

a. correlation
b. regression
c. survey
*d. experiment

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31. Which of the following does NOT happen when conducting an experiment?

a. Manipulation of an independent variable
*b. Subjectively observe the dependent variable to see what happens.
c. Measuring the effect on a dependent variable.
d. Controlling the experimental situation

32. If random assignment is NOT used in an experiment which of the following variables can destroy the integrity of the research study?

*a. confounding variable
b. independent variable
c. dependent variable
d. control variable

33. 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.

34. 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

35. Which of the following is NOT an advantage 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

36. Causal _____ is a description of the consequences of manipulating an independent variable, while causal _____ is explaining the mechanisms through which a causal relationship operates.

a. explanation; descriptive
b. narrative; illumination
*c. descriptive; explanation
d. identification; relationship

37. Which of the following helps to create the advantage of "control over extraneous variables" in experimental research?

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a. bringing the experiment into the laboratory
b. using random assignment
c. equating the groups on all variables except the IV
*d. all of the above

38. 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

39. 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

40. 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.

41. 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.

42. 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

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

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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

44. 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.

45. 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

46. 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 and 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

47. 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 and 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

48. Which of the following experimental research settings does NOT include the manipulation of an IV?

a. laboratory experiments
b. field experiments
c. internet experiments
d. all of the above include the manipulation of an IV

49. Nonexperimental quantitative research is particularly useful for

*a. describing relationships and making predictions
b. deciding which variable causes which effect.

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c. manipulating the IV
d. controlling relevant environmental variables.

50. Which of the following is a disadvantage of nonexperimental quantitative research?

a. an inability to determine if two variables are associated
b. we cannot determine the strength of a relationship
c. nonexperimental quantitative research tends to be artificial
*d. we cannot establish cause and effect with a correlational study.

51. In chapter 1, we learned that the main objectives of scientific research are description, explanation, prediction, and control. Nonexperimental quantitative 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

52. 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.

53. 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.

54. 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

55. 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

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d. we know that we have quantified a relationship between the two variables

56. Although we cannot establish causality from nonexperimental quantitative research, 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

57. Advanced types of nonexperimental quantitative research can be used to probe causation when manipulation of the IV is

a. not possible
b. not ethically acceptable
*c. a and b
d. neither a or b

58. Dr. Frasier is a developmental research psychologist who is interested in providing evidence that children process word information (DV) differently depending on their age (IV). Which of the following designs can Dr. Frasier conduct?

a. qualitative research design
*b. nonexperimental research design
c. mixed method design
d. true experimental design

59. Dr. Walton is a biological psychologist interested in the effect of alcohol (IV) on memory (DV). Dr. Walton realized she cannot conduct a true experimental design that includes random assignment of alcohol doses to participants. Which of the following is the reason Dr. Walton has to conduct a nonexperimental quantitative research design?

a. A true experimental design is not at all possible
b. A true experimental design is not practical
*c. A true experimental design is not ethically acceptable.
d. A true experimental design is too expensive.

60. 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

61. Qualitative research is interpretive, which involves

*a. extracting information from non-numerical data.

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b. using objective measurements.
c. quantifying non-numerical data.
d. using only rating scales

62. _____ 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

63. Dr. Parker is interested in the culture of individuals who attend comic conventions and attends many conventions to attempt to understand the perspective of the participants. Dr. Parker takes on the role of _____ and relates the subjective data to the purpose and questions of the research.

a. subjective observer
*b. objective outsider
c. participant outsider
d. subjective interviewer

64. Dr. Abbott is conducting a qualitative research study on elementary school playgrounds. She wants to gain as much information as possible related to elementary school playgrounds. She uses multiple sources of data from elementary school students, teachers, and administrators as well as collaborates with other investigators in other school districts. She and her collaborators conduct interviews, take photographs, and observe individuals during playground time. Which of the following qualitative research concepts is Dr. Abbott utilizing?

a. interpretation
b. context dependency
c. local hypothesis generation
*d. triangulation

65. 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.

66. Which of the following is NOT a strength of qualitative research

a. a useful approach to explore new phenomena
b. excellent way to describe a phenomena in rich detail
*c. easy to generalize finding to other contexts or locations
d. useful approach to look at existing phenomena in a new way

67. Qualitative research findings are _____ to generalize because the data are typically based on local particular

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data.

*a. difficult
b. easy
c. neutral
d. slow

68. Which of the following could be considered a weakness 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

69. Of the three styles of mixed methods research (MMR) which is primarily quantitative and is supplemented with qualitative data for additional understanding?

*a. quantitatively driven MMR
b. qualitatively driven MMR
c. equal status MMR
d. integrative MMR

70. Of the three styles of mixed methods research (MMR) which is primarily qualitative and is supplemented with quantitative data for additional understanding?

a. quantitatively driven MMR
*b. qualitatively driven MMR
c. equal status MMR
d. integrative MMR

71. Of the three styles of mixed methods research (MMR) which is equal parts quantitative and qualitative data?

a. quantitatively driven MMR
b. qualitatively driven MMR
*c. integrative MMR
d. divergent MMR

72. Dr. Antal is researching a new therapy technique for victims of sexual assault through the use of journaling about their trauma. In her final published manuscript on her study she reports many quantitative aspects of her data including comparing a journal and non journal group of participants. She also reports some excerpts from the journals to give the research some context. She sees all aspects of her reported results as equally important. Which type of mixed methods research (MMR) would you consider her study?

a. quantitatively driven MMR
b. qualitatively driven MMR
*c. integrative MMR
d. divergent MMR

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73. 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

74. 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

75. Which of the following is NOT a strength of using tests as a method of data collection?

a. standardization
*b. expense
c. group administration
d. comparability

76. Which of the following is the most favorable direction to take when using tests as a method of data collection?

a. develop your own test
b. find an already developed test and create your own version of it.
*c. look for a valid and reliable test in publish psychological research literature
d. pay an undergraduate student to develop a test for you

77. Dr. Konrad is conducting a research study in which he is collecting information on attitudes and opinions from a large group of individuals using both closed and open ended questions. Which of the following methods of data collection is Dr. Konrad most likely using?

a. interview
b. focus group
c. existing data
*d. questionnaire.

78. Which of the following is NOT a weakness of using questionnaires as a method of data collections?

*a. high validity and reliability
b. nonresponse to some items
c. socially desirable responses
d. low response rate

79. _____ 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.

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

80. 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

81. Which of the following is a weakness of interviews as a method of data collection

a. allows for probing and follow up questions from the interviewer
*b. can be expensive and time consuming
c. telephone interviews can give the researcher quick turnaround
d. high validity with interview protocols

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

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

83. _____ 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

84. 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.

85. During _____ sampling observations are recorded during preselected time intervals, but during _____ sampling observations are recorded every time a particular event occurs.

a. complete; observer
b. naturalistic; laboratory
c. focus; test

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*d. time interval; event

86. Dr. Knight is conducting a qualitative research study on the culture of individuals who get tattoos. She is currently debating on which type of observations she wants to conduct as part of her study. If she chooses to be a complete _____ she will observe from the outside and not inform the participants that she is studying them. But she may choose complete _____ in which she becomes a full member of the group and informs them of her observations in order to gain permission.

a. participant; observer
*b. observer; participant
c. member; bystander
d. bystander; member

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

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

88. _____ data is data that was left behind by another research or collected for some other purpose.

a. Primary
b. Interview
*c. Secondary
d. Observation

89. 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

90. _____ is data that originally was used for a different research project and was stored in a way that others can use it.

a. observations
*b. archived data
c. documents
d. physical data

Vocabulary

Define the following terms:

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Archived research data
Categorical variable
Causal description
Causal explanation
Causation
Cause
Cause-and-effect relationship
Confounding variable
Constant
Correlational research
Dependent variable (DV)
Document
Effect
Equal-status or integrative MMR
Event sampling
Existing or secondary data
Experimental research
Extraneous variable
Field experiment
Focus group
Independent variable (IV)
Internet experiment
Interview
Laboratory experiment
Laboratory observation
Manipulation
Mediating variable
Method of data collection
Mixed methods research
Moderator variable
Naturalistic observation
Nonexperimental quantitative research (NQR)
Nonexperimental research
Nonnumerical data
Numerical data
Observation
Physical data
Psychological experiment
Qualitative research
Qualitatively driven MMR
Quantitative research
Quantitative variable
Quantitatively driven MMR
Questionnaire
Tests
Third variable problem
Time-interval sampling
Triangulation
Variable

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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. What is qualitative research? What are the strengths and limitations of this type of research?

16. Explain the three types of missed methods research? Give an example of each type.

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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 qualitative 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:

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- 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

- 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 nonexperimental quantitative research is helpful in accomplishing the scientific objectives of description and prediction. To extend this discussion, you might describe how nonexperimental quantitative 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 Society for Teaching of Psychology has an online Teaching of Psychology Idea Exchange page. This link http://topix.teachpsych.org/w/page/19980983/Correlations is to a page dedicated entirely to spurious correlations and may be helpful in discussing the third variable problem.

5. 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

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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

6. The Web site Clips for Class (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?

- Kinsey- Movie Trailer
  - A montage of movie scenes is presented, but of note are the scenes depicting the research method the interview. Kinsey introduces himself and trains his research assistants on how to act when participants are being interviewed.
  - Kinseys interview techniques provided vivid data on the sexual practices of people in the late 1940s and 1950s.
  - What advice do you think he gave his research assistants on how to interview participants effectively? What advantages and disadvantages would you anticipate with data obtained from face-to-face interviews?
- The Worlds Deepest Bin TheFunTheory.com (example of a field experiment)
  - TheFunTheory.com conducts an experiment in order to get park passersby to throw their trash in a bin by making it a fun activity.
  - The experimenter installs a motion-detection device that triggers an entertaining sound when rubbish is thrown into the bin. During a one day period 72 k of trash is thrown into the bin; a nearby trash bin receives less than half that amount. What kind of experiment is being conducted in this video?
- Independent and Dependent Variables
  - This video explains the difference between independent and dependent variables using the example of the length of your hair based on how many days it has been since you got a haircut. What other common task could you make into a dependency relationship?

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7. YouTube video explaining research using The Strange Situation developed by Mary Ainsworth. Good demonstration of structured laboratory observation. http://www.youtube.com/watch?v=QTsewNrHUHU

8. 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

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