Chapter 01: Introduction to Statistics and Research

Multiple Choice
1. Which of the following is not a purpose of statistical procedures?
   a. Organizing data
   b. Summarizing data
   c. Hypothesizing data
   d. Communicating data

   **ANSWER:** c
   **DIFFICULTY:** Easy
   **REFERENCES:** p. 3
   **KEYWORDS:** statistical procedures

2. In statistics a population is
   a. the entire group to which a law of nature applies.
   b. a subset of a group to which a law of nature applies.
   c. all the people in the world.
   d. an infinite number that cannot be counted.

   **ANSWER:** a
   **DIFFICULTY:** Easy
   **REFERENCES:** p. 5
   **KEYWORDS:** population

3. In statistics, a sample is
   a. the entire group to which a law is applied.
   b. a subset of a group to which a law is applied.
   c. all of the subjects in which we are interested.
   d. at least half of the subjects in the population.

   **ANSWER:** b
   **DIFFICULTY:** Easy
   **REFERENCES:** p. 5
   **KEYWORDS:** sample
Chapter 01: Introduction to Statistics and Research

4. The individuals measured in a sample are called the
   a. scores.
   b. population.
   c. observations.
   d. participants.

   ANSWER: d
   DIFFICULTY: Easy
   REFERENCES: p. 5
   The Logic of Research
   KEYWORDS: participants

5. A representative sample is one
   a. created by selecting only those participants determined to be representative of the larger population.
   b. having characteristics accurately reflecting the characteristics of the population.
   c. based on the luck of the draw.
   d. known to be a biased sample.

   ANSWER: b
   DIFFICULTY: Easy
   REFERENCES: p. 6
   The Logic of Research
   KEYWORDS: representative sample

6. A statistics class has 60% females and 40% males. A researcher selects a sample having 80% males and 20% females. Why should the researcher be cautious of making inferences about the entire class based on the sample?
   a. Because the sample appears to be representative of the population.
   b. Because the sample appears to be unrepresentative of the population.
   c. Because the opinions of the females in the sample will not be the same as those of the females in the population.
   d. Because the sample was too small.

   ANSWER: b
   DIFFICULTY: Moderate
   REFERENCES: p. 6
   The Logic of Research
   KEYWORDS: representative sample
Chapter 01: Introduction to Statistics and Research

7. In research, the aspects of the situation or behavior we measure are called
   a. scores.
   b. variables.
   c. relationships.
   d. samples and populations.

   ANSWER:  b  
   DIFFICULTY:  Moderate  
   REFERENCES:  p. 6  
                 The Logic of Research  
   KEYWORDS:  variables

8. Which of the following is a variable?
   a. The number of students in your statistics class today
   b. The date and month of the 4th of July
   c. The height of the players on a basketball team
   d. Your latest test score

   ANSWER:  c  
   DIFFICULTY:  Easy  
   REFERENCES:  p. 6  
                 The Logic of Research  
   KEYWORDS:  variables

9. When a change in the scores of one variable is accompanied by a consistent change in the scores of another variable, we have what is known as a
   a. cause-and-effect explanation.
   b. relationship.
   c. variable.
   d. set of scores.

   ANSWER:  b  
   DIFFICULTY:  Easy  
   REFERENCES:  p. 7  
                 Understanding Relationships  
   KEYWORDS:  relationship
10. Of the following data sets, which shows a relationship?
   a. Sample A  b. Sample B  c. Sample C  d. Sample D

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</table>

**ANSWER:** a

**DIFFICULTY:** Moderate

**REFERENCES:** p. 7
   Understanding Relationships

**KEYWORDS:** relationship

11. A relationship is *not* present when
   a. each unique Y score is paired with one and only one X score.
   b. as the Y scores increase, the X scores also increase.
   c. as the Y scores decrease, the X scores increase.
   d. virtually the same set of Y scores is paired with every X score.

**ANSWER:** d

**DIFFICULTY:** Easy

**REFERENCES:** p. 8
   Understanding Relationships

**KEYWORDS:** relationship

12. If I want to summarize the characteristics of my statistics class to my friend, I should use
   a. an experimental design.
   b. a correlational design.
   c. inferential statistics.
   d. descriptive statistics.

**ANSWER:** d

**DIFFICULTY:** Easy

**REFERENCES:** p. 10
   Applying Descriptive and Inferential Statistics

**KEYWORDS:** descriptive statistics
13. In order to make statements about the population from information obtained from a sample, we must use
   a. an experimental design.
   b. a correlational design.
   c. inferential statistics.
   d. descriptive statistics.

   **ANSWER:** c

   **DIFFICULTY:** Easy

   **REFERENCES:** p. 10

   **KEYWORDS:** inferential statistics

14. The variable systematically changed or manipulated by a researcher in an experiment is called the
   a. independent variable.
   b. correlational variable.
   c. dependent variable.
   d. extraneous variable.

   **ANSWER:** a

   **DIFFICULTY:** Easy

   **REFERENCES:** p. 12

   **KEYWORDS:** independent variables

15. Suppose you are interested in how participants perform under different temperature conditions. You select 30
   participants and assign them to work in one of three rooms. The rooms differ only with respect to temperature. You
   instruct all participants to solve the same jigsaw puzzle, and then you measure how long it takes each one to finish.
   This research is an example of
   a. a correlational study.
   b. population measurement.
   c. an experimental study.
   d. the use of descriptive statistics.

   **ANSWER:** c

   **DIFFICULTY:** Easy

   **REFERENCES:** p. 12

   **KEYWORDS:** experiment
16. A specific amount or category of the independent variable creating the specific situation under which the participants’ scores on some other variable are measured is called a/an
a. independent variable.
b. dependent variable.
c. statistic.
d. condition.

ANSWER:  d
DIFFICULTY:  Easy
REFERENCES:  p. 12
Understanding Experiments and Correlational Studies
KEYWORDS: condition

17. The variable measured as an experiment is being carried out is called the
a. independent variable.
b. correlational variable.
c. dependent variable.
d. extraneous variable.

ANSWER:  c
DIFFICULTY:  Easy
REFERENCES:  p. 12
Understanding Experiments and Correlational Studies
KEYWORDS: dependent variables

18. A researcher investigates whether there is a relationship between hours of sleep and memory for photographs by having 40 people sleep in the laboratory and waking 20 of the participants after 4 hours of sleep and the others after 8 hours of sleep. After they are awakened, each participant is asked to study 21 photographs and then recall as many details from the photographs as possible. In this study, what is 8 hours of sleep?
a. The independent variable
b. The dependent variable
c. The sample
d. A condition of the independent variable

ANSWER:  d
DIFFICULTY:  Moderate
REFERENCES:  p. 12
Understanding Experiments and Correlational Studies
KEYWORDS: condition
19. Suppose you are interested in how participants perform under different temperature conditions. You select 30 participants and assign them to work in one of three rooms. The rooms differ only with respect to temperature. You instruct all participants to solve the same jigsaw puzzle, and then you measure how long it takes each one to finish. In this research, the experimenter is investigating whether
a. participants can solve a jigsaw puzzle in different rooms.
b. participants can solve a jigsaw puzzle under different temperature conditions.
c. the time required to solve a jigsaw puzzle depends on temperature.
d. temperature depends on the time required to solve a jigsaw puzzle.

ANSWER: c
DIFFICULTY: Moderate
REFERENCES: p. 12 Understanding Experiments and Correlational Studies
KEYWORDS: dependent variables | independent variables

20. Which of the following studies is best for showing the first variable produces a change in the second variable?
a. A researcher asks people who are entering the grocery store how hungry they are and then asks them how much they spent on food as they leave the store.
b. A researcher has participants sleep various amounts of hours and then observes how cranky they are.
c. A researcher asks participants how well they like to think and how many books they have read in the last 6 months.
d. A researcher asks participants how many hours per week they listened to Beethoven while growing up and then gives them a math ability test.

ANSWER: b
DIFFICULTY: Moderate
REFERENCES: p. 12 Understanding Experiments and Correlational Studies
KEYWORDS: correlational study | experiment

21. In a/an ____________________, the experimenter measures scores on two variables. In a/an ____________________, the experimenter manipulates or changes one variable and measures scores on the other.
a. correlational study; research design
b. research design; experiment
c. correlational study; experiment
d. experiment; correlational study

ANSWER: c
DIFFICULTY: Easy
REFERENCES: pp. 10-12 Understanding Experiments and Correlational Studies
KEYWORDS: correlational study | experiment
22. What do the design of the study and the scale of measurement have in common?
a. They are the aspects of a study to consider when deciding whether to conduct statistical analysis.
b. They are the aspects of a study known only to the researcher.
c. They are the aspects of a study to consider when deciding which descriptive or inferential statistics to use.
d. They are the aspects of a study known only after the study is completed.

ANSWER: c  
DIFFICULTY: Moderate  
REFERENCES: p. 12-14  
Understanding Experiments and Correlational Studies  
KEYWORDS: design | measurement scale

23. Which of the following orders lists the scales of measurement from the scale providing the least specific information to the scale providing the most specific information?
a. ratio, interval, ordinal, nominal  
b. ratio, interval, nominal, ordinal  
c. ordinal, nominal, interval, ratio  
d. nominal, ordinal, interval, ratio

ANSWER: d  
DIFFICULTY: Easy  
REFERENCES: pp. 15-16  
The Characteristics of Scores  
KEYWORDS: measurement scale

24. Gender is a clear example of a/an _____________________________ variable.
a. qualitative  
b. quantitative  
c. independent  
d. dependent

ANSWER: a  
DIFFICULTY: Easy  
REFERENCES: p. 7  
The Logic of Research
25. Quantitative variables particularly measure
   a. amounts.
   b. mere presence.
   c. associations.
   d. significance.

   ANSWER:   a
   DIFFICULTY:  Easy
   REFERENCES:  p. 7
                 The Logic of Research
   KEYWORDS:  quantitative variables

26. Numbers obtained from a sample are known as
   a. statistics.
   b. parameters.
   c. designs.
   d. variables.

   ANSWER:   a
   DIFFICULTY:  Easy
   REFERENCES:  Applying Descriptive and Inferential Statistics
                 p. 11
   KEYWORDS:  a statistic

27. Symbols associated with different parameters come from the _______________ alphabet.
   a. Greek
   b. Hebrew
   c. Chinese
   d. German

   ANSWER:   a
   DIFFICULTY:  Moderate
   REFERENCES:  Applying Descriptive and Inferential Statistics
                 p. 11
   KEYWORDS:  a parameter
28. A dependent variable is so named because it is dependent on
   a. a participant's reaction to a condition.
   b. the experimenter's behavior.
   c. the participant's personality.
   d. the level of measurement.

   **ANSWER:**  a
   **DIFFICULTY:** Difficult
   **REFERENCES:** p. 13
   Understanding Experiments and Correlational Studies
   **KEYWORDS:** dependent variables

29. Correlational studies primarily are done to
   a. determine whether there is a relationship between two variables.
   b. establish cause and effect.
   c. manipulate an independent variable.
   d. determine appropriate parameters.

   **ANSWER:**  a
   **DIFFICULTY:** Easy
   **REFERENCES:** p. 14
   Understanding Experiments and Correlational Studies
   **KEYWORDS:** correlational studies

30. Variables that are more appropriate to categorize tend to fall on the ________________ scale.
   a. nominal
   b. ordinal
   c. ratio
   d. interval

   **ANSWER:**  a
   **DIFFICULTY:** Moderate
   **REFERENCES:** p. 15
   The Characteristics of Scores
   **KEYWORDS:** nominal/measurement scales
Subjective Short Answer

31. For each variable, place a checkmark under the correct measurement scale and type.

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<th>Type</th>
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<td>x</td>
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<tr>
<td>Amount of taxes paid last year</td>
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<tr>
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**ANSWER:**

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**DIFFICULTY:** Moderate

**REFERENCES:** pp. 15-16

**KEYWORDS:** continuous | discrete | measurement scale

32. The income of lawyers their first year after law school would be an example of what type of variable?

**ANSWER:** Continuous

**DIFFICULTY:** Easy

**REFERENCES:** p. 16

**KEYWORDS:** continuous

33. A researcher investigated whether a person’s mood influences another person’s mood. The researcher divided the participants into three groups. Participants in the first group interacted with a happy person. Participants in the second group interacted with a sad person. Participants in the third group interacted with an emotionally neutral person. After the interaction, the researcher measured how happy the participants were. What are the conditions of the independent variable in this study?

**ANSWER:** Happy, sad, and neutral

**DIFFICULTY:** Moderate

**REFERENCES:** p. 12

**KEYWORDS:** condition
34. Tiffany is conducting an experiment. She is interested in how fifth-grade teachers can motivate boys to read more. With the approval of her state’s Board of Education, she is able to attend the annual conference of teachers and have the fifth-grade teachers complete her survey instrument. In this study, what would we consider the fifth-grade teachers at the conference?

**ANSWER:** The sample

**DIFFICULTY:** Moderate

**REFERENCES:** p. 5

The Logic of Research

**KEYWORDS:** population/sample

35. “The average weight of students in the statistics class is 143 pounds” is an example of what type of statement?

**ANSWER:** Descriptive

**DIFFICULTY:** Moderate

**REFERENCES:** p. 10

Applying Descriptive and Inferential Statistics

**KEYWORDS:** descriptive/inferential

36. “Based on a sample of 52 classrooms, our institution is using 12% less electricity than one year ago” is an example of what type of statement?

**ANSWER:** Inferential

**DIFFICULTY:** Moderate

**REFERENCES:** p. 10

Applying Descriptive and Inferential Statistics

**KEYWORDS:** inferential statistics

37. What describes where a researcher actively changes or manipulates one variable, measures the scores on another variable, and keeps all other variables constant?

**ANSWER:** The researcher has conducted an experiment.

**DIFFICULTY:** Easy

**REFERENCES:** p.12

Understanding Experiments and Correlational Studies

**KEYWORDS:** experiment

38. Suppose you are interested in how participants behave in different color conditions. You select 30 participants and assign them to one of three rooms. The rooms differ only with respect to the color of the walls. One room is white, one is pale blue, and a third is bright red. Each participant is served a meal of a hamburger and french fries, and you then measure how long it takes them to finish eating. What would be the independent variable in this study?

**ANSWER:** The color of the room serves as the independent variable.

**DIFFICULTY:** Moderate

**REFERENCES:** p. 12

Understanding Experiments and Correlational Studies

**KEYWORDS:** independent variables
39. A researcher investigates whether there is a relationship between participating in school clubs and GPA by comparing GPAs from 40 students who are members of at least one school club with those from 40 students who are not members of a club. What is the independent variable in this study?

**ANSWER:** Participation in clubs serves as the independent variable.

**DIFFICULTY:** Moderate

**REFERENCES:** p. 12
Understanding Experiments and Correlational Studies

**KEYWORDS:** independent variables

40. Mason is conducting a study on the effect of computer-based training on the math ability of seventh-graders. He randomly assigns one group of students to use a computer-based training method and another group of students to use workbooks. In this study, what would we view math ability as being?

**ANSWER:** Math ability is the dependent variable.

**DIFFICULTY:** Moderate

**REFERENCES:** p. 12
Understanding Experiments and Correlational Studies

**KEYWORDS:** dependent variables

41. Suppose you are interested in how participants behave in different color conditions. You select 30 participants and assign them to one of three rooms. The rooms differ only with respect to the color of the walls. One room is white, one is pale blue, and a third is bright red. Each participant is served a meal of a hamburger and french fries, and you then measure how long it takes them to finish eating. In this research, what is the dependent variable?

**ANSWER:** The dependent variable is the time to finish eating.

**DIFFICULTY:** Moderate

**REFERENCES:** p. 12
Understanding Experiments and Correlational Studies

**KEYWORDS:** dependent variables

42. Suppose you are interested in how participants behave in different color conditions. You select 30 participants and assign them to one of three rooms. The rooms differ only with respect to the color of the walls. One room is white, one is pale blue, and a third is bright red. Each participant is served a meal of a hamburger and french fries, and you then measure how long it takes them to finish eating. What are the conditions of the independent variable?

**ANSWER:** The conditions of the independent variable are red, white, and blue.

**DIFFICULTY:** Moderate

**REFERENCES:** p. 12
Understanding Experiments and Correlational Studies

**KEYWORDS:** condition
43. Simone observed a group of adults at the local shopping mall. She recorded the length of time (in minutes) they stayed and the number of purchases they made, and then analyzed her data to see if there was a relationship between these two variables. What type of study is this called?

**ANSWER:** This is a correlational study.

**DIFFICULTY:** Moderate

**REFERENCES:** p. 14

Understanding Experiments and Correlational Studies

**KEYWORDS:** correlation

44. “Watch for me on the football field. I’ll be wearing number 32.” What scale of measurement is described by this statement?

**ANSWER:** This represents a nominal measurement.

**DIFFICULTY:** Moderate

**REFERENCES:** p. 15

The Characteristics of Scores

**KEYWORDS:** measurement scale/nominal

45. What is the scale of measurement involved in the statement, “My daughter is four years old.”?

**ANSWER:** This is an example of a ratio measurement.

**DIFFICULTY:** Moderate

**REFERENCES:** p. 16

The Characteristics of Scores

**KEYWORDS:** measurement scale/ratio

46. Suppose a teacher is interested in surveying her students' attitudes about various social issues. On the day of the survey, everyone is present and takes it except for one student (who is absent). Can we conclude that a population has been measured in this example? Why or why not?

**ANSWER:** No, this is a sample. Even if just one person is not included in a study from a given population, we cannot accurately say that we have surveyed the population.

**DIFFICULTY:** Difficult

**REFERENCES:** p. 5

The Logic of Research

**KEYWORDS:** population

47. Why is an independent variable so named?

**ANSWER:** An independent variable is supposed to be independent of a participants' wishes, preferences, and personal characteristics.

**DIFFICULTY:** Difficult

**REFERENCES:** p. 12

Understanding Experiments and Correlational Studies

**KEYWORDS:** independent variables
48. Dr. Thompson has randomly assigned participants to walk for 30, 5, or 0 minutes and then measures their mood. How many conditions are present in this study?

**ANSWER:** Three

**DIFFICULTY:** Moderate

**REFERENCES:** p. 12
Understanding Experiments and Correlational Studies

**KEYWORDS:** conditions

49. Betty insists that ratio scales are the only measurement scales that contain the number 0. Is she correct?

**ANSWER:** Technically, Betty is only partially correct. Only ratio scales contain a "true zero" where the number 0 really means nothing is present. However, the number zero could be used in an interval or even nominal measurement--though this wouldn't reflect a "true zero."

**DIFFICULTY:** Difficult

**REFERENCES:** p. 16
The Characteristics of Scores

**KEYWORDS:** ratio scale/levels of measurement

50. Is the number of children one has a discrete or continuous variable (or both)?

**ANSWER:** Technically, the number of children one has is a discrete variable. However, we often look at this variable as being theoretically continuous particularly in the context of summarizing large amounts of population data (e.g., government statistics).

**DIFFICULTY:** Difficult

**REFERENCES:** pp. 16-17
The Characteristics of Scores

**KEYWORDS:** discrete vs. continuous variables