Interpreting and Using Statistics in Psychological Research 1st edition Christopher Test Bank

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Chapter 2: Basics of Quantitative Research: Variables, Scales of Measurement, and an Introduction to the Statistical Package for the Social Sciences (SPSS)

TEST BANK

LEARNING OBJECTIVES:

1. Identify and differentiate between independent variables, quasi-independent variables, and dependent variables.
2. Present operational definitions for constructs.
3. Summarize the notions and forms of reliability and validity.
4. Classify data into appropriate scales of measurement.
5. Establish a basic SPSS spreadsheet.

Multiple Choice

1. In an experiment on group dynamics, participants are placed in a group consisting of either three or eight people. During the experiment, group members work together to solve a puzzle. After completing this task, participants report how satisfied they are with the other members of their group. In this example, the number of people in the group is the _____ variable, and satisfaction with the other members of their group is the _____ variable.
a. independent; dependent
b. dependent; independent
c. quasi-independent; independent
d. independent; quasi-independent
Ans: A
Learning Objective: 1: Identify and differentiate among independent variables, quasi-independent variables, and dependent variables.
Cognitive Domain: Application
Answer Location: The Study
Difficulty Level: Medium

2. In a study evaluating the effectiveness of mathematics practice on statistics exam scores, a researcher has one sample of individuals practice mathematics problems, and a second sample is given a lecture about the mathematics involved in statistics. For this study, what is the dependent variable?
a. the mathematics lecture
b. the statistics exam scores
c. the individuals given the mathematics practice problems
d. the students
Ans: B
Learning Objective: 1: Identify and differentiate among independent variables, quasi-independent variables, and dependent variables.
Cognitive Domain: Application
Answer Location: The Study
Difficulty Level: Medium

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3. The dependent variable:
a. varies as a direct function of the number of participants in an experiment
b. is the variable that is controlled or manipulated by the researcher
c. is observed and measured in response to an independent variable
d. keeps changing and should be eliminated from experimental studies
Ans: C
Learning Objective: 1: Identify and differentiate among independent variables, quasi-independent variables, and dependent variables.
Cognitive Domain: Knowledge
Answer Location: The Study
Difficulty Level: Easy

4. The variable that is controlled (manipulated) by the researcher in an experiment is called the _____ variable.
a. independent
b. quasi-independent
c. continuous
d. dependent
Ans: A
Learning Objective: 1: Identify and differentiate among independent variables, quasi-independent variables, and dependent variables.
Cognitive Domain: Knowledge
Answer Location: The Study
Difficulty Level: Easy

5. Variables that cannot be directly assessed but must be inferred in some way are called:
a. operational definitions
b. continuous variables
c. discrete variables
d. constructs
Ans: D
Learning Objective: 2: Present operational definitions for constructs.
Cognitive Domain: Knowledge
Answer Location: Variables
Difficulty Level: Easy

6. Self-esteem, wind speed, and resting heart rate are each an example of a(n):
a. variable
b. construct
c. operational definition
d. nominal measurement
Ans: A
Learning Objective: 2: Present operational definitions for constructs.
Cognitive Domain: Application

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Answer Location: Variables
Difficulty Level: Medium

7. The specification of precisely how a variable will be measured in a research study is called:
a. a construct
b. an operational definition
c. a scale
d. an ordinal measurement
Ans: B
Learning Objective: 2: Present operational definitions for constructs.
Cognitive Domain: Knowledge
Answer Location: Operational Definitions
Difficulty Level: Easy

8. Which one of the following terms best illustrates an operational definition?
a. punishment—harsh or injurious treatment for an offense
b. learning—acquiring knowledge or skill
c. thirst—18 hours without access to water
d. anxiety—state of being uneasy, apprehensive, or worried
Ans: C
Learning Objective: 2: Present operational definitions for constructs.
Cognitive Domain: Application
Answer Location: Operational Definitions
Difficulty Level: Medium

9. When you define "stress level" as the amount of cortisol (a stress hormone) in the human body, you are:
a. formulating a theory about stress
b. developing a research hypothesis
c. operationally defining the term *stress*
d. doing a naturalistic study of stress
Ans: C
Learning Objective: 2: Present operational definitions for constructs.
Cognitive Domain: Application
Answer Location: Operational Definitions
Difficulty Level: Medium

10. Which of the following single words best describes the notion of measurement reliability?
a. appropriateness
b. consistency
c. duration
d. quantitative
Ans: B
Learning Objective: 3: Summarize the notions and forms of reliability and validity.
Cognitive Domain: Comprehension

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Answer Location: Measurement Reliability and Validity
Difficulty Level: Easy

11. Which of the following single words best describes the notion of measurement validity?
a. appropriateness
b. consistency
c. duration
d. quantitative
Ans: A
Learning Objective: 3: Summarize the notions and forms of reliability and validity.
Cognitive Domain: Comprehension
Answer Location: Measurement Reliability and Validity
Difficulty Level: Easy

12. Critics believe that tests such as the SAT and ACT do not do a good job of predicting success in college. Therefore, there is controversy about what role these test scores should have in college admissions decisions. This controversy centers around:
a. test-retest reliability
b. internal reliability
c. criterion validity
d. construct validity
Ans: C
Learning Objective: 3: Summarize the notions and forms of reliability and validity.
Cognitive Domain: Application
Answer Location: Measurement Reliability and Validity
Difficulty Level: Medium

13. A researcher demonstrates that people's scores on the Wechsler Adult Intelligence Scale (WAIS) are similar when they take the test at two different points in time. The research has demonstrated the _____ of the WAIS.
a. construct validity
b. criterion validity
c. internal reliability
d. test-retest reliability
Ans: D
Learning Objective: 3: Summarize the notions and forms of reliability and validity.
Cognitive Domain: Application
Answer Location: Measurement Reliability and Validity
Difficulty Level: Medium

14. The degree to which a variable is operationally defined appropriately is called:
a. construct validity
b. criterion validity
c. internal reliability
d. test-retest reliability
Ans: A

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Learning Objective: 3: Summarize the notions and forms of reliability and validity.
Cognitive Domain: Knowledge
Answer Location: Measurement Reliability and Validity
Difficulty Level: Easy

15. If we used foot size to operationally define intelligence, we are lacking _____ validity in our measurement.
a. internal
b. external
c. construct
d. criterion
Ans: C
Learning Objective: 3: Summarize the notions and forms of reliability and validity.
Cognitive Domain: Application
Answer Location: Measurement Reliability and Validity
Difficulty Level: Hard

16. Which one of the following is an example of a nominal level of measurement?
a. reaction time of an adult male measured before and after drinking an ounce of alcohol
b. a high school senior's first, second, and third choices of colleges to attend
c. estimating the number of red blood cells in a laboratory sample
d. classification of psychiatric patients as either "neurotic" or "psychotic"
Ans: D
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Application
Answer Location: Nominal Data
Difficulty Level: Medium

17. After measuring two individuals, a researcher can say that Bob's score is greater than Tim's, but cannot specify how much greater. These measurements must have come from what type of scale?
a. interval
b. ratio
c. nominal
d. ordinal
Ans: D
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Application
Answer Location: Ordinal Data
Difficulty Level: Medium

18. Annual income measured in dollar amount is an example of a variable measured on what type of scale?
a. nominal
b. ordinal
c. interval

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d. ratio
Ans: D
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Application
Answer Location: Interval Data
Difficulty Level: Medium

19. Ranking a group of cities in terms of "quality of life" would be an example of measurement of a(n) _____ scale of measurement.
a. nominal
b. ordinal
c. interval
d. ratio
Ans: B
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Application
Answer Location: Ordinal Data
Difficulty Level: Medium

20. Which of the following is not a continuous variable?
a. number of family pets
b. temperature outside
c. a person's height
d. time to solve a problem
Ans: A
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Application
Answer Location: Discrete Versus Continuous Variables
Difficulty Level: Medium

21. Which of the following is a discrete variable?
a. number of family pets
b. temperature outside
c. a person's height
d. time to solve a problem
Ans: A
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Application
Answer Location: Discrete Versus Continuous Variables
Difficulty Level: Medium

22. Interval and ratio data are often simply referred to as _____ data.
a. scale
b. ranked
c. categorical
d. discrete

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Ans: A
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Comprehension
Answer Location: Interval and Ratio (Scale) Data
Difficulty Level: Easy

SHORT ANSWERS

1. A researcher designs a study to test whether playing with Legos increases intelligence in children.
a. What is the independent variable?
Ans: Playing with Legos

b. What is the dependent variable?
Ans: intelligence

c. Provide an operational definition for the independent variable and for the dependent variable.
Ans: For the independent variable, we could have two groups of children, one who is randomly assigned to play with Legos for 30 minutes and a second group that does not play with Legos. For the dependent variable, we could give children a standardized measure of intelligence, such as the Wechsler Intelligence Scale for Children (WISC).

d. How could the researchers use a quasi-independent variable rather than an independent variable?
Ans: The researchers could study children who like to play with Legos (a naturally occurring group) and compare their intelligence to children who do not play with Legos (the second naturally occurring group).

e. What is the disadvantage of using a quasi-independent variable instead of an independent variable in this research?
Ans: Because there is no random assignment to the groups, researchers cannot draw cause-and-effect conclusions as they can with an independent variable.

Learning Objective: 1: Identify and differentiate among independent variables, quasi-independent variables, and dependent variables; Learning Objective 2: Present operational definitions for constructs
Cognitive Domain: Application
Answer Location: The Study; Operational Definitions
Difficulty Level: Hard

2. A researcher designs a study to test whether doing yoga improves physical health.
a. What is the independent variable?
Ans: whether or not people do yoga

b. What is the dependent variable?
Ans: physical health

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c. Provide an operational definition for one of the variables.
Ans: For the independent variable, we could randomly assign people to do yoga twice a week, and randomly assign other people not to do yoga. For the dependent variable, we could measure how long it takes people to run one mile.

d. How could the researchers use a quasi-independent variable rather than an independent variable?
Ans: The researchers could study people who do yoga as part of their normal routines (a naturally occurring group) and compare their physical health to people who do not do yoga as part of their normal routines (the second naturally occurring group).

e. What is the disadvantage of using a quasi-independent variable instead of an independent variable in this research?
Ans: Because there is no random assignment to the groups, researchers cannot draw cause-and-effect conclusions as they can with an independent variable.

Learning Objective: 1: Identify and differentiate among independent variables, quasi-independent variables, and dependent variables; Learning Objective 2: Present operational definitions for constructs.
Cognitive Domain: Application
Answer Location: The Study; Operational Definitions
Difficulty Level: Hard

3. What is the difference between an independent variable and a quasi-independent variable?
Ans: An independent variable is controlled (manipulated) by the researcher, whereas a quasi-independent variable consists of naturally occurring groups that the research does not control.
Learning Objective: 1: Identify and differentiate among independent variables, quasi-independent variables, and dependent variables.
Cognitive Domain: Analysis
Answer Location: The Study
Difficulty Level: Medium

4. Why are operational definitions so important in a research study?
Ans: They allow other people to understand precisely how a construct was measured, thereby allowing other researchers to build upon that research study.
Learning Objective: 2: Present operational definitions for constructs.
Cognitive Domain: Comprehension
Answer Location: Operational Definitions
Difficulty Level: Medium

5. For each of the following constructs, (a) state an operational definition of the construct and (b) state the scale of measurement for your operational definition.
a. Diet
b. Religiosity
c. Mental health

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Ans: There are numerous operational definitions for these constructs. The scale of measurement will follow from the operational definition provided.
Learning Objective: 2: Present operational definitions for constructs; Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Application
Answer Location: Operational definitions; Scales of Measurement: How We Measure Variables
Difficulty Level: Hard

6. Explain how you could operationalize the construct of a person's "physical height" using:
a. a nominal measurement
b. an ordinal measurement
c. a scale measurement
Ans:
a. Divide people into "tall" and "short" categories based on some cutoff height.
b. Rank people from shortest to tallest.
c. Ask for people's height in feet and inches (or meters).
Learning Objective: 2: Present operational definitions for constructs; Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Application
Answer Location: Operational definitions; Scales of Measurement: How We Measure Variables
Difficulty Level: Hard

7. What is the difference between measurement reliability and validity?
Ans: Reliability refers to consistency of the measurement, whereas validity refers to the appropriateness of the measure in a given situation.
Learning Objective: 3: Summarize the notions and forms of reliability and validity.
Cognitive Domain: Analysis
Answer Location: Measurement Reliability and Validity
Difficulty Level: Medium

8. Why should a measurement possess test-retest reliability?
Ans: People should score similarly when they take the same measurement (or test) on two different testing occasions. If they do not score similarly, it means the measurement is not reliable.
Learning Objective: 3: Summarize the notions and forms of reliability and validity.
Cognitive Domain: Analysis
Answer Location: Measurement Reliability and Validity
Difficulty Level: Medium

9. Why is internal reliability potentially easier to figure out than test-retest reliability?
Ans: To get internal reliability, a researcher only needs to have data from a measurement on one occasion, whereas to get test-retest reliability, a researcher needs to have data from a measurement on two different occasions.
Learning Objective: 3: Summarize the notions and forms of reliability and validity.
Cognitive Domain: Analysis

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Answer Location: Measurement Reliability and Validity
Difficulty Level: Medium

10. What is the difference between construct validity and criterion validity?
Ans: Construct validity refers to how well a variable is operationalized, whereas criterion validity refers to how well a variable or set of variables predicts some outcome.
Learning Objective: 3: Summarize the notions and forms of reliability and validity.
Cognitive Domain: Analysis
Answer Location: Measurement Reliability and Validity
Difficulty Level: Hard

11. Give an example of how a researcher can establish the internal reliability of a measurement (test).
Ans: She can give one test to a group of people on one occasion. Then, she can divide the items on that test into two groups and see how similar scores are on the two halves of the test.
Learning Objective: 3: Summarize the notions and forms of reliability and validity.
Cognitive Domain: Application
Answer Location: Measurement Reliability and Validity
Difficulty Level: Hard

12. Why do we need to care about scales of measurement in research?
Ans: How we measure a variable determines the types of statistical tools we can use to understand our data
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Comprehension
Answer Location: Scales of Measurement: How We Measure Variables
Difficulty Level: Hard

13. What information do ordinal data provide that nominal data do not provide?
Ans: Whereas nominal data provide categories of people, objects, or events, ordinal data tell us the rankings within a given category.
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Analysis
Answer Location: Scales of Measurement: How We Measure Variables
Difficulty Level: Hard

14. What information do interval data provide that ordinal data do not provide?
Ans: For ordinal data, we don't know the difference between rankings provided. With interval data, the differences between numbers are of equal size.
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Analysis
Answer Location: Scales of Measurement: How We Measure Variables
Difficulty Level: Hard

15. Rank the four scales of measurement from least informative to most informative.
Ans: nominal, ordinal, interval, ratio

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Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Comprehension
Answer Location: Scales of Measurement: How We Measure Variables
Difficulty Level: Medium

16. Referring to the previous question, what type of measurement scale did you just provide?
Ans: ordinal
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Application
Answer Location: Scales of Measurement: How We Measure Variables
Difficulty Level: Easy

17. What is the difference between a continuous variable and a discrete variable?
Ans: A continuous variable can be in factional units, whereas a discrete variable can only be in whole numbers.
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Comprehension
Answer Location: Discrete Versus Continuous Variables
Difficulty Level: Medium

18. Give an example of a continuous variable and an example of a discrete variable.
Ans: Answers will depend on the student's response, and there are infinite possible correct answers to both parts of the question.
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Application
Answer Location: Discrete Versus Continuous Variables
Difficulty Level: Medium

FILL IN THE BLANKS

1. A characteristic that has different values or changes among individuals is called a(n) _____.
Ans: variable
Learning Objective: 2: Present operational definitions for constructs.
Cognitive Domain: Knowledge
Answer Location: Variables
Difficulty Level: Easy

2. A variable that cannot be directly assessed but must be inferred in some way is called a(n) _____.
Ans: construct
Learning Objective: 2: Present operational definitions for constructs.
Cognitive Domain: Knowledge
Answer Location: Variables
Difficulty Level: Easy

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3. The specification of precisely how a variable is measured in a research study is called a(n) _____.
Ans: operational definition
Learning Objective: 2: Present operational definitions for constructs.
Cognitive Domain: Knowledge
Answer Location: Variables
Difficulty Level: Easy

4. The extent to which a measure produces consistent results is called _____.
Ans: reliability
Learning Objective: 3: Summarize the notions and forms of reliability and validity.
Cognitive Domain: Knowledge
Answer Location: Measurement Reliability and Validity
Difficulty Level: Easy

5. The extent to which people tend to score similarly on a measurement that is completed at two different points in time is called _____.
Ans: test-retest reliability
Learning Objective: 3: Summarize the notions and forms of reliability and validity
Cognitive Domain: Knowledge
Answer Location: Measurement Reliability and Validity
Difficulty Level: Easy

6. The extent to which people tend to score similarly on different parts of a measurement that is completed only once is called _____.
Ans: internal reliability
Learning Objective: 3: Summarize the notions and forms of reliability and validity.
Cognitive Domain: Knowledge
Answer Location: Measurement Reliability and Validity
Difficulty Level: Easy

7. The extent to which a measure is appropriate to use in a given context is called _____.
Ans: validity
Learning Objective: 3: Summarize the notions and forms of reliability and validity.
Cognitive Domain: Knowledge
Answer Location: Measurement Reliability and Validity
Difficulty Level: Easy

8. The degree to which a variable is operationalized appropriately is called _____.
Ans: construct validity
Learning Objective: 3: Summarize the notions and forms of reliability and validity
Cognitive Domain: Knowledge
Answer Location: Measurement Reliability and Validity
Difficulty Level: Easy

9. How well a measure predicts some outcome is called _____.

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Ans: criterion validity
Learning Objective: 3: Summarize the notions and forms of reliability and validity.
Cognitive Domain: Knowledge
Answer Location: Measurement Reliability and Validity
Difficulty Level: Easy

10. Categorical data are typically called _____ data.
Ans: nominal
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Knowledge
Answer Location: Nominal Data
Difficulty Level: Easy

11. Rank-ordered data are typically called _____ data.
Ans: ordinal
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Knowledge
Answer Location: Ordinal Data
Difficulty Level: Easy

12. Data in which the distance between each number is of the same magnitude are typically called _____ data.
Ans: interval
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Knowledge
Answer Location: Interval and Ratio (Scale) Data
Difficulty Level: Easy

13. Interval data that have a meaningful zero point are typically called _____ data.
Ans: ratio
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Knowledge
Answer Location: Interval and Ratio (Scale) Data
Difficulty Level: Easy

14. _____ data refers to interval and ratio data without making a distinction between them.
Ans: Scale
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Knowledge
Answer Location: Interval and Ratio (Scale) Data
Difficulty Level: Easy

15. A variable that can only have a whole number value is called a(n) _____ variable.
Ans: discrete
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Knowledge

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Answer Location: Discrete Versus Continuous Variables
Difficulty Level: Easy

16. A variable that can have a fractional value is called a(n) _____ variable.
Ans: continuous
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Knowledge
Answer Location: Discrete Versus Continuous Variables
Difficulty Level: Easy

17. Indicate if each of the following variables is measured on nominal, ordinal, interval, or ratio scale.
_____ a. A person's race as measured by self-report on a questionnaire
_____ b. Numbers on a baseball player's uniform
_____ c. Assigning grades (A, B, C, D, F) to students in a class to indicate knowledge of the material
_____ d. Classifying people based on gender
_____ e. The reaction time of someone trying to determine if a group of letters actually forms a word
_____ f. The number of synapses a person has in one square centimeter of brain tissue
_____ g. A person's extent of agreement using a 1 (*strongly disagree*) to 5 (*strongly agree*) response range
_____ h. The temperature as measured by a Celsius thermometer
_____ i. Ranking 25 employees in terms of their level of productivity
Ans:
a. Nominal
b. Nominal
c. Nominal
d. Nominal
e. Ratio
f. Ratio
g. Interval
h. Interval
i. Ordinal
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Application
Answer Location: Scales of Measurement: How We Measure Variables
Difficulty Level: Medium

18. Decide which of the following variables are discrete and which are continuous.
_____ a. The number of cans of Coke a person drinks in a day
_____ b. The number of times a person checks their e-mail in a day
_____ c. Your numerical score on an exam
_____ d. Number of miles (or kilometers) between Boston, MA, and Dallas, TX
_____ e. The temperature outside as measured by a Celsius thermometer
_____ f. The number of people in our class whose name you can remember

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Ans:
a. Continuous
b. Discrete
c. Continuous
d. Continuous
e. Continuous
f. Discrete
Learning Objective: 4: Classify data into appropriate scales of measurement.
Cognitive Domain: Application
Answer Location: Scales of Measurement: How We Measure Variables
Difficulty Level: Medium

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