Chapter 2: Levels of Measurement and Aggregation

Test Bank

Multiple Choice
1. A respondent's race would be considered a _____.
a. variable
b. constant
c. unit of analysis
Ans: B
Learning Objective: 2.1. Summarize the role of variables in research.
Cognitive Doman: Knowledge
Answer Location: Introduction
Difficulty Level: Easy

2. Political party identification would be an example of what type of variable?
a. categorical
b. continuous
c. quantitative
d. ranked
Ans: A
Learning Objective: 2.3. Describe the difference between variables that identify qualities compared with variables that identify quantities.
Cognitive Doman: Comprehension
Answer Location: Levels of measurement
Difficulty Level: Easy

3. Which of the following is an example of a quantitative variable?
a. gender
b. number of crimes committed in the past year
c. religion
d. country of origin
Ans: B
Learning Objective: 2.3. Describe the difference between variables that identify qualities compared with variables that identify quantities.
Cognitive Doman: Comprehension
Answer Location: Levels of measurement
Difficulty Level: Easy

4. A rank of first, second, and third from a competition would be an example of which type of variable?
a. nominal
b. ordinal
c. interval

d. ratio
Ans: B
Learning Objective: 2.2. Identify the four levels of measurement variables can have.
Cognitive Doman: Comprehension
Answer Location: Ordinal level of measurement
Difficulty Level: Easy

5. On a survey, individuals are asked how fearful of crime they are in their neighborhood. The answer choices are 1 = very fearful; 2 = somewhat fearful; 3 = not very fearful; 4 = not fearful at all. This is an example of which type of variable?
a. nominal
b. ordinal
c. interval
d. ratio
Ans: B
Learning Objective: 2.2. Identify the four levels of measurement variables can have.
Cognitive Doman: Comprehension
Answer Location: Ordinal level of measurement
Difficulty Level: Easy

6. The number of crimes one committed in the past 6 months is an example of which type of variable?
a. nominal
b. ordinal
c. interval
d. ratio
Ans: D
Learning Objective: 2.2. Identify the four levels of measurement variables can have.
Cognitive Doman: Comprehension
Answer Location: Ratio level of measurement
Difficulty Level: Easy

7. To be classified as an _____ variable the difference between adjacent values along the measurement scale must be the same at every two points.
a. nominal-level
b. ordinal-level
c. interval-level
d. ratio-level
Ans: C
Learning Objective: 2.2. Identify the four levels of measurement variables can have.
Cognitive Doman: Comprehension
Answer Location: Interval level of measurement
Difficulty Level: Easy

8. A survey question that asked "Have you gotten arrested at least once in your life?" would be an example of what type of variable?

a. quantitative
b. binary
c. qualitative
d. constant
Ans: B
Learning Objective: 2.3. Describe the difference between variables that identify qualities compared with variables that identify quantities.
Cognitive Doman: Comprehension
Answer Location: The case of dichotomies
Difficulty Level: Easy

9. If your hometown had a population of 100,000 and had 10 homicides last year, what would the homicide rate per 1,000 be?
a. 0.01
*b. 0.10
c. 0.001
d. 0.0001
Ans: B
Learning Objective: 2.4. Explain the differences among raw frequencies, proportions, percentages, and rates.
Cognitive Doman: Application
Answer Location: Counts and rates
Difficulty Level: Medium

10). Given the hypothetical table below, which age group has the highest rate of committing violent crimes?

Age Group	Number of Violent Crimes Committed (f)	Population Count
12–17	2,300	545,370
18–24	8,900	527,410
25–34	11,850	604,500
35–49	10,900	684,150
50–64	6,300	566,990
65 and over	1,090	112,760

a. 18–24
b. 25–34
c. 35–49
d. 50–64
Ans: B
Learning Objective: 2.4. Explain the differences among raw frequencies, proportions, percentages, and rates.
Cognitive Doman: Application
Answer Location: Counts and rates
Difficulty Level: Easy

11. The following equation, $\frac{Number\ in\ Subset}{Total\ number} * Constant(100,000)$, is the derivation for _____.
a. rate
b. percentage
c. ratio
d. proportion
Ans: A
Learning Objective: 2.4. Explain the differences among raw frequencies, proportions, percentages, and rates.
Cognitive Doman: Comprehension
Answer Location: The importance of rates for victimization data
Difficulty Level: Medium

12. If a researcher was interested in the number of gun homicides in multiple cities across a state, what would the unit of analysis be?
a. guns
b. crime
c. cities
d. people
Ans: C
Learning Objective: 2.5. Define the units of analysis in any particular data set.
Cognitive Doman: Comprehension
Answer Location: Units of analysis
Difficulty Level: Easy

True/False

13. A nominal level variable can also be a dichotomous variable.
Ans: T
Learning objective: 2.1. Summarize the role of variables in research.
Cognitive domain: Knowledge
Answer location: The case of dichotomies
Difficulty level: Easy

14. Outdoor temperature in degrees Fahrenheit would be considered an ordinal variable?
Ans: F
Learning objective: 2.2. Identify the four levels of measurement variables can have.
Cognitive domain: Knowledge
Answer location: Ratio levels of measurement
Difficulty level: Easy

15. Interval and ratio level variables are considered continuous measures.
Ans: T
Learning objective: 2.2. Identify the four levels of measurement variables can have.

Cognitive domain: Knowledge
Answer location: Ratio levels of measurement
Difficulty level: Easy

16. A count is the number of times an even occurs in the data.
Ans: T
Learning objective: 2.2. Identify the four levels of measurement variables can have.
Cognitive domain: Knowledge
Answer location: Counts and rates
Difficulty level: Easy

17. When surveying individuals about the number of crimes they have committed, the unit of analysis is the individual.
Ans: T
Learning objective: 2.5. Define the units of analysis in any particular data set.
Cognitive domain: Comprehension
Answer location: Units of analysis
Difficulty level: Easy

18. The NCVS uses the individual as the unit analysis while the FBI uses the city or state as the unit of analysis.
Ans: T
Learning objective: 2.5. Define the units of analysis in any particular data set.
Cognitive domain: Comprehension
Answer location: Units of analysis
Difficulty level: Easy

19. If a researcher was studying the effects of extra policing on geographically targeted areas versus control areas with no extra policing, the unit of analysis would be the police officer?
Ans: F
Learning objective: 2.5. Define the units of analysis in any particular data set.
Cognitive domain: Comprehension
Answer location: Units of analysis
Difficulty level: Medium

20. If a researcher was studying neighborhood levels of informal social control across different neighborhoods, the neighborhood would be the unit of analysis?
Ans: T
Learning objective: 2.5. Define the units of analysis in any particular data set.
Cognitive domain: Comprehension
Answer location: Units of analysis
Difficulty level: Medium

Essay

21. Discuss the different levels of measurement and give an example for each.

Ans: Answers may vary.

Nominal Level variables convey classification or categorization information only. Examples include gender, race, religion, political party, city born in, etc.

Ordinal level variables are categorical but the categories have some type of relationship to each other. The categories can be ordered from high to low or low to high but there is no exact quantity between the categories. We know a category is more or less but do not know exactly how much more or less. Examples would include income or age categories, likert type items, etc.

Interval-level variables allow us to quantify the numeric relationship among the categories. The difference between the adjacent values must be the same at every two points. Examples would be age, temperature on the Fahrenheit scale, etc.

Ratio level variables have all the qualities of interval-level variable and a true-zero point. A true zero indicates that the phenomenon is absent. Examples would include number of crimes committed, number of times a person was victimized, number of hours worked, etc.

Learning objective: 2.2. Identify the four levels of measurement variables can have.

Cognitive domain: Comprehension

Answer Location: Levels of Measurement

Difficulty level: Medium

22. Calculate the rate of crime per 100,000.

City	Number of Crimes	Total Population	Rate per 100,000
City A	730,300	2,600,000	
City B	700,000	615,000	

Ans: City A rate = 28,088.088; City B rate = 113,821.138

Learning objective: 2.4. Explain the differences among raw frequencies, proportions, percentages, and rates.

Cognitive domain: Application/Analysis

Answer Location: Count and rates

Difficulty level: Medium

23. Complete the frequencies and percentages for the following table.

Age of Respondent	*f*	%
Under 18	15	_____
18–30	29	_____
31–50	_____	22.1
50 and older	_____	_____
		_____
Total	86	100.0

Ans: % for under 18 is 17.4; % for 18–30 is 33.7; frequency for 31–50 is 19; *f* for 50 and older is 23; % for 50 and older is 26.7.

Learning objective: 2.4. Explain the differences among raw frequencies, proportions, percentages, and rates.
Cognitive domain: Application/Analysis
Answer Location: Proportions and percentages
Difficulty level: Hard

24. Why should a researcher use rates, percentages, or proportions over simple counts and frequencies?
Ans: Answers may vary.
Students should include the following: Simple counts and frequencies do not take into consideration the size of the total at-risk population within each category. They allow a standardization to compare across groups of unequal sizes. Simple frequencies can lead to misleading conclusions.
Learning objective: 2.4. Explain the differences among raw frequencies, proportions, percentages, and rates.
Cognitive domain: Comprehension
Answer Location: Counts and rates; The importance of rates for victimization data; Proportion and percentages
Difficulty level: Medium

25. You are able to gain access to a prison to distribute your survey questionnaire. You ask inmates the number of crimes they committed prior to their sentence. Their responses have been organized into the following frequency distribution table. Fill in the missing frequency and percentages.

# of crimes committed	f	%
0	20	_____
1–2	9	_____
3–5	6	_____
5 or more	_____	_____
Total	110	100.0

Ans: f = 75; % for 0 = 18; % for 1–2 = 8; % for 3–5 = 5; and % for 5 or more= 68.
Learning objective: 2.4. Explain the differences among raw frequencies, proportions, percentages, and rates.
Cognitive domain: Application/Analysis
Answer Location: Proportions and percentages
Difficulty level: Hard