

Chapter 2: Research Methodology

Test Bank

Multiple Choice

1. What does the Scoville scale measure?
- a. the psychophysical reaction to sense data
 - b. the amount of capsaicin we detect in food
 - c. the strength and amplitude of sound waves
 - d. the amount of caffeine in coffee

Ans: B

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Knowledge

Answer Location: Introduction

Difficulty Level: Easy

2. A food company wants to develop a psychological measure to evaluate people's perception of sweetness. What should they do?
- a. Ask participants to rate a number of levels of sweetness on a numerical scale.
 - b. Ask participants to indicate the sweetest food that they like to eat.
 - c. Ask participants to judge the point at which a drink becomes too sweet.
 - d. Ask participants to judge the amount of capsaicin in the foods they consume.

Ans: A

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Application

Answer Location: Introduction

Difficulty Level: Medium

3. Why is the Scoville scale considered a psychophysical scale?
- a. It measures the relation of velocity to loudness.
 - b. It measures a psychological variable (piquancy) as a function of a physical dimension (the amount of capsaicin).
 - c. It measures a physical variable (the amount of heat) as a function of a sensory dimensions (taste and touch).
 - d. It focuses on the psychological, rather than the physical, experience of consuming hot peppers.

Ans: B

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Analysis

Answer Location: Introduction

Difficulty Level: Medium

4. In what method are stimuli presented in a graduated scale, with participants asked to judge the stimuli along a certain property that goes up or down?

- a. the method of adjustment
- b. the method of repugnancy
- c. the magnitude method
- d. the method of limits

Ans: D

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Knowledge

Answer Location: Method of Limits

Difficulty Level: Easy

5. The smallest amount of a stimulus necessary to allow an observer to detect its presence is known as the _____ threshold.

- a. complete
- b. partial
- c. absolute
- d. relative

Ans: C

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Knowledge

Answer Location: Method of Limits

Difficulty Level: Easy

6. Jaime is a participant in a psychophysical experiment on sound detection. He is asked to determine the softest sound he can hear at a particular frequency. That sound is his _____.

- a. motivational limit
- b. signal detection limit
- c. absolute threshold
- d. difference threshold

Ans: C

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Application

Answer Location: Method of Limits

Difficulty Level: Medium

7. The smallest difference between two stimuli that can be detected is known as the _____.

- a. difference threshold
- b. absolute threshold
- c. just observable difference
- d. remarkable difference

Ans: A

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Knowledge

Answer Location: Method of Limits

Difficulty Level: Easy

8. Difference thresholds in visual detection vary as a function of _____.

- a. the level of auditory distraction
- b. the amount of sensory overload in the system
- c. whether the judgments are being made at threshold or above threshold
- d. whether there is a clear relationship between visual and auditory stimuli

Ans: C

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Analysis

Answer Location: Method of Constant Stimuli

Difficulty Level: Medium

9. In absolute threshold detection experiments, the crossover point is defined as the point at which _____.

- a. a person is first able to detect a stimulus
- b. a person ceases to detect a stimulus
- c. all stimuli in a sequence will be correctly detected
- d. the number of hits and false alarms doubles

Ans: A

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Knowledge

Answer Location: Method of Limits

Difficulty Level: Easy

10. Dr. Wong is doing a psychophysical experiment to determine the smallest detectable concentration of coffee. He presents some coffee concentrations that are clearly detectable, others that cannot be detected, and some that are just detectable. These presentations are randomized. What method is Dr. Wong using?

- a. adjudication
- b. constant stimuli
- c. inverse thresholds
- d. limits

Ans: B

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Application

Answer Location: Method of Constant Stimuli

Difficulty Level: Hard

11. A method whereby an observer controls the level of the stimulus and sets it at the perceptual threshold is known as the method of _____.

- a. adjustment
- b. constant stimuli
- c. thresholds
- d. limits

Ans: A

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Knowledge

Answer Location: Method of Adjustment

Difficulty Level: Easy

12. Dr. Patel is doing an experiment on the softest volume humans can hear at a particular frequency. He asks participants to set a dial to the softest possible sound they can hear. What method is Dr. Patel using?

- a. control
- b. limits
- c. sensitivity
- d. adjustment

Ans: D

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Application

Answer Location: Method of Adjustment

Difficulty Level: Hard

13. What is the point of subjective equality?

- a. the point at which the method of limits generates the same responses as the method of adjustment
- b. the point at which observers experience two different stimuli as being identical
- c. the point at which subject estimates correspond to objective measures
- d. the point at which the sensation of piquancy transforms from pleasant to unpleasant

Ans: B

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Knowledge

Answer Location: Method of Adjustment

Difficulty Level: Easy

14. A psychophysical method in which participants judge and assign numerical estimates to the perceived strength of a stimulus is known as _____.

- a. magnitude estimation
- b. response compression
- c. threshold sensitivity

d. the signal detection axis

Ans: A

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Knowledge

Answer Location: Magnitude Estimation

Difficulty Level: Easy

15. If we double the amount of capsaicin in our hot sauce, according to response expansion, we can expect_____.

- a. less than double the amount of perceived piquancy
- b. more than double the amount of perceived piquancy
- c. no increase in the amount of perceived piquancy
- d. a proportional decrease in perceived piquancy

Ans: B

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Application

Answer Location: Magnitude Estimation

Difficulty Level: Medium

16. A psychophysical method in which a participant is *required* to report when or where a stimulus occurs instead of whether it was perceived is known as the _____.

- a. forced-choice method
- b. open response method
- c. free-choice method
- d. closed response method

Ans: A

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Comprehension

Answer Location: Catch Trials and Their Use

Difficulty Level: Easy

17. Professor Everdine is interested in devising a scale to examine people's perception of saltiness. She asks participants to rate solutions with various amounts of salt dissolved in them on a scale from 0 (not salty at all) to 100 (extremely salty). This method is known as _____.

- a. limit testing
- b. magnitude estimation
- c. signal detection
- d. threshold evaluation

Ans: B

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Application

Answer Location: Magnitude Estimation
Difficulty Level: Medium

18. Dr. Chudnofsky is interested in the smallest differences in the wavelength of light and the ability of humans to detect these differences. He should therefore design an experiment that will look at _____.

- a. correct rejections
- b. absolute thresholds
- c. difference thresholds
- d. false alarms

Ans: C

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Application

Answer Location: Method of Limits

Difficulty Level: Medium

19. In two-point thresholds across the skin, one measures _____.

- a. the minimum distance at which two touches are perceived as two touches and not one
- b. the maximum distance at which two touches are perceived as two touches and not one
- c. the minimum distance at which one touch is perceived as two touches
- d. only the maximum distance for touches in the most sensitive areas of the skin

Ans: A

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Comprehension

Answer Location: Method of Limits

Difficulty Level: Easy

20. Professor Everdine has devised a scale to examine people's perception of saltiness. She finds that for every milligram of salt added, the perception of saltiness increases fourfold. That is, the perception of saltiness increases faster than the actual increase in salt. This finding illustrates response _____.

- a. compression
- b. expansion
- c. subtraction
- d. addition

Ans: B

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Application

Answer Location: Magnitude Estimation

Difficulty Level: Medium

21. An observer is asked to adjust the level of pressure on the skin until the person can just barely feel the lightest pressure on his or her skin. Then the observer starts again from a different starting level of pressure. Which technique does this best represent?

- a. magnitude estimation
- b. response compression
- c. signal-inverse method
- d. method of adjustment

Ans: D

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Analysis

Answer Location: Method of Adjustment

Difficulty Level: Hard

22. Karwan is a participant in a psychophysical experiment on visual detection. He is shown a mix of near-threshold stimuli with stimulus-absent catch trials. When Karwan indicates that he saw a light in a stimulus-absent catch trial, he is making a _____.

- a. hit
- b. correct rejection
- c. miss
- d. false alarm

Ans: D

Learning Objective: 2.2: Demonstrate an understanding of signal detection theory.

Cognitive Domain: Application

Answer Location: Signal Detection Theory

Difficulty Level: Medium

23. Karwan is a participant in a psychophysical experiment on visual detection. He is shown a mix of near-threshold stimuli with stimulus-absent catch trials. When Karwan indicates that he did not see a light that was actually present, he is making a _____.

- a. hit
- b. correction rejection
- c. miss
- d. false alarm

Ans: C

Learning Objective: 2.2: Demonstrate an understanding of signal detection theory.

Cognitive Domain: Application

Answer Location: Signal Detection Theory

Difficulty Level: Medium

24. In signal detection theory, an internal cutoff above which the observer makes one response and below which the observer makes another response is known as a _____.

- a. threshold
- b. limit
- c. criterion

d. series

Ans: C

Learning Objective: 2.2: Demonstrate an understanding of signal detection theory.

Cognitive Domain: Knowledge

Answer Location: Signal Detection Theory

Difficulty Level: Easy

25. In signal detection theory, if the cost of a miss is very high and the risk of a false alarm is very low, the criterion will be set _____.

- a. very low to maximize hits
- b. very low to maximize correct rejections
- c. very high to minimize false alarms
- d. very high to maximize hits

Ans: A

Learning Objective: 2.2: Demonstrate an understanding of signal detection theory.

Cognitive Domain: Analysis

Answer Location: Signal Detection Theory

Difficulty Level: Hard

26. A radiologist screening mammograms to detect breast cancer in a high-risk patient is likely to _____.

- a. adopt a low criterion because she does not want signal-detection misses
- b. adopt a high criterion because she does not want many signal-detection false alarms
- c. do everything she can to decrease sensitivity so as to create more correct rejections
- d. do everything she can to increase sensitivity so as to create fewer false alarms

Ans: A

Learning Objective: 2.2: Demonstrate an understanding of signal detection theory.

Cognitive Domain: Application

Answer Location: Signal Detection Theory

Difficulty Level: Hard

27. The mathematical measure of sensitivity in signal-detection theory is known as _____.

- a. the cost coefficient
- b. d' -prime
- c. alpha
- d. the ROC curve

Ans: B

Learning Objective: 2.2: Demonstrate an understanding of signal detection theory.

Cognitive Domain: Knowledge

Answer Location: Signal Detection Theory

Difficulty Level: Easy

28. A plot of false alarms versus hits for any given sensitivity, indicating all possible outcomes for a given sensitivity, is known as _____.

- a. a ROC curve

- b. a noise plot
- c. criterion processing
- d. object-substitution masking

Ans: A

Learning Objective: 2.2: Demonstrate an understanding of signal detection theory.

Cognitive Domain: Knowledge

Answer Location: Signal Detection Theory

Difficulty Level: Easy

29. Dr. Kao is developing a technique to screen for malignant tumors. Dr. Kao's technique should _____.

- a. increase sensitivity to maximize hits regardless of the number of misses
- b. increase sensitivity to maximize hits but minimize misses
- c. decrease sensitivity to maximize correct rejections
- d. decrease sensitivity to minimize false alarms

Ans: B

Learning Objective: 2.2: Demonstrate an understanding of signal detection theory.

Cognitive Domain: Analysis

Answer Location: Signal Detection Theory

Difficulty Level: Hard

30. Masking is a difficulty associated with which sense?

- a. hearing
- b. smell
- c. touch
- d. vision

Ans: D

Learning Objective: 2.3: Examine how signal detection processes are used to examine how sensory modalities interact with each other. Explain how masking works.

Cognitive Domain: Knowledge

Answer Location: In Depth: Signal Detection and Multisensory Processing

Difficulty Level: Easy

31. Masking experiments require participants to determine whether a stimulus is _____.

- a. present
- b. pleasant
- c. strong or weak
- d. increasing or decreasing

Ans: A

Learning Objective: 2.3: Examine how signal detection processes are used to examine how sensory modalities interact with each other. Explain how masking works.

Cognitive Domain: Comprehension

Answer Location: In Depth: Signal Detection and Multisensory Processing

Difficulty Level: Easy

32. Marco participates in a masking experiment. After the experiment, the researcher tells Marco that he has a high d' score. Which of the following must be true of Marco?

- a. He is good at predicting when a stimulus will appear.
- b. His sense of smell is stronger than his visual acuity.
- c. He is good at identifying when no stimulus is present.
- d. His pattern recognition skills are above average.

Ans: C

Learning Objective: 2.3: Examine how signal detection processes are used to examine how sensory modalities interact with each other. Explain how masking works.

Cognitive Domain: Analysis

Answer Location: In Depth: Signal Detection and Multisensory Processing

Difficulty Level: Hard

33. Robinson et al (2016) conducted a study of whether olfaction interacts with vision. What did they find?

- a. There was no measurable interaction between the two senses.
- b. Interaction between the two senses was more pronounced in women.
- c. Interaction between the two senses was more pronounced in men.
- d. There was a high degree of interaction between the senses.

Ans: B

Learning Objective: 2.3: Examine how signal detection processes are used to examine how sensory modalities interact with each other. Explain how masking works.

Cognitive Domain: Comprehension

Answer Location: In Depth: Signal Detection and Multisensory Processing

Difficulty Level: Medium

34. Which neuroimaging technique produces the best spatial maps of the brain?

- a. EEG
- b. MEG
- c. fMRI
- d. TMS

Ans: C

Learning Objective: 2.4: Evaluate neuroscience methods and what they tell us about sensation and perception.

Cognitive Domain: Comprehension

Answer Location: Application: Psychophysics in Assessment: Hearing Tests and Vision Tests

Difficulty Level: Easy

35. Which neuroimaging technique uses electrodes to determine the time course of perceptual processes?

- a. EEG
- b. MEG
- c. fMRI
- d. TMS

Ans: A

Learning Objective: 2.4: Evaluate neuroscience methods and what they tell us about sensation and perception.

Cognitive Domain: Knowledge

Answer Location: Application: Psychophysics in Assessment: Hearing Tests and Vision Tests

Difficulty Level: Easy

36. Neuroimaging techniques were an advancement on early methods because they allow researchers to study _____ brains.

- a. inactive
- b. human
- c. underdeveloped
- d. living

Ans: D

Learning Objective: 2.4: Evaluate neuroscience methods and what they tell us about sensation and perception.

Cognitive Domain: Comprehension

Answer Location: Application: Psychophysics in Assessment: Hearing Tests and Vision Tests

Difficulty Level: Easy

37. Which of the following is TRUE of transcranial magnetic stimulation?

- a. It induces changes in brain function.
- b. It picks up continuous electric signal.
- c. It uses magnetic sensors to detect brain activity.
- d. It takes a picture every 30 milliseconds.

Ans: A

Learning Objective: 2.4: Evaluate neuroscience methods and what they tell us about sensation and perception.

Cognitive Domain: Comprehension

Answer Location: Application: Psychophysics in Assessment: Hearing Tests and Vision Tests

Difficulty Level: Easy

38. Permanent hearing loss caused by damage to the cochlea or auditory nerve is called _____ hearing loss.

- a. sensorineural
- b. conductive
- c. innate
- d. bichromal

Ans: A

Learning Objective: 2.5: Assess how audiologists and optometrists use psychophysical assessment tools to measure patients' hearing and visual abilities and, in some cases, help them find appropriate corrective measures.

Cognitive Domain: Knowledge

Answer Location: Application: Psychophysics in Assessment: Hearing Tests and Vision

Tests

Difficulty Level: Easy

39. The inability of sound to be transmitted to the cochlea is known as _____ hearing loss.

- a. sensorineural
- b. conductive
- c. innate
- d. bichromal

Ans: B

Learning Objective: 2.5: Assess how audiologists and optometrists use psychophysical assessment tools to measure patients' hearing and visual abilities and, in some cases, help them find appropriate corrective measures.

Cognitive Domain: Knowledge

Answer Location: Application: Psychophysics in Assessment: Hearing Tests and Vision Tests

Difficulty Level: Easy

40. Which of the following will an audiogram show?

- a. the increase in decibels required to get a binaural response
- b. the extent of neural damage in the cochlea
- c. the increase in sensitivity due to advanced hearing loss
- d. the lowering of sensitivity for different frequencies in each ear

Ans: D

Learning Objective: 2.5: Assess how audiologists and optometrists use psychophysical assessment tools to measure patients' hearing and visual abilities and, in some cases, help them find appropriate corrective measures.

Cognitive Domain: Comprehension

Answer Location: Application: Psychophysics in Assessment: Hearing Tests and Vision Tests

Difficulty Level: Easy

41. What is the name for the condition that causes an inability to focus clearly on far objects, which occurs because accommodation cannot make the lens thin enough?

- a. presbyopia
- b. amblyopia
- c. macular degeneration
- d. myopia

Ans: D

Learning Objective: 2.5: Assess how audiologists and optometrists use psychophysical assessment tools to measure patients' hearing and visual abilities and, in some cases, help them find appropriate corrective measures.

Cognitive Domain: Comprehension

Answer Location: Application: Psychophysics in Assessment: Hearing Tests and Vision Tests

Difficulty Level: Easy

42. A condition in which incoming light focuses behind the retina, leading to difficulty focusing on close-up objects, common in older adults, in whom the lens becomes less elastic, is known as _____.

- a. presbyopia
- b. myopia
- c. cataracts
- d. macular degeneration

Ans: A

Learning Objective: 2.5: Assess how audiologists and optometrists use psychophysical assessment tools to measure patients' hearing and visual abilities and, in some cases, help them find appropriate corrective measures.

Cognitive Domain: Knowledge

Answer Location: Application: Psychophysics in Assessment: Hearing Tests and Vision Tests

Difficulty Level: Easy

43. What diagnosis might a patient receive after a test of visual acuity?

- a. presbyopia
- b. macular degeneration
- c. retinopathy
- d. conjunctivitis

Ans: A

Learning Objective: 2.5: Assess how audiologists and optometrists use psychophysical assessment tools to measure patients' hearing and visual abilities and, in some cases, help them find appropriate corrective measures.

Cognitive Domain: Comprehension

Answer Location: Application: Psychophysics in Assessment: Hearing Tests and Vision Tests

Difficulty Level: Easy

44. Dr. Alvarez is an optometrist. While examining a patient, he detects a medical problem with one of her eyes. What is he most likely to do?

- a. prescribe antibiotics
- b. refer the patient to an ophthalmologist
- c. adjust the patient's prescription to reduce strain
- d. use the Snellen chart to assess the extent of the problem

Ans: B

Learning Objective: 2.5: Assess how audiologists and optometrists use psychophysical assessment tools to measure patients' hearing and visual abilities and, in some cases, help them find appropriate corrective measures.

Cognitive Domain: Application

Answer Location: Application: Psychophysics in Assessment: Hearing Tests and Vision Tests

Difficulty Level: Medium

45. A graph that illustrates the thresholds for the frequencies as measured by the audiometer is known as a(n) _____.

- a. Snellen chart
- b. frequency curve
- c. acuity graph
- d. audiogram

Ans: D

Learning Objective: 2.5: Assess how audiologists and optometrists use psychophysical assessment tools to measure patients' hearing and visual abilities and, in some cases, help them find appropriate corrective measures.

Cognitive Domain: Knowledge

Answer Location: Application: Psychophysics in Assessment: Hearing Tests and Vision Tests

Difficulty Level: Easy

True/False

1. What measures 15,000 on the Scoville scale for one person may represent a different number for somebody else.

Ans: F

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Comprehension

Answer Location: Introduction

Difficulty Level: Easy

2. The two-point touch threshold is the minimum distance at which two touches are perceived as two touches and not one.

Ans: T

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Knowledge

Answer Location: Method of Limits

Difficulty Level: Easy

3. In signal detection analysis, a false alarm is an error that occurs when a nonsignal is mistaken for a target signal.

Ans: T

Learning Objective: 2.2: Demonstrate an understanding of signal detection theory.

Cognitive Domain: Knowledge

Answer Location: Signal Detection Theory

Difficulty Level: Easy

4. Two observers make different judgments in a signal-detection experiment even though their sensitivity is identical. This may be the result of different criterion.

Ans: T

Learning Objective: 2.2: Demonstrate an understanding of signal detection theory.

Cognitive Domain: Comprehension

Answer Location: Signal Detection Theory

Difficulty Level: Medium

5. Women tend to have an advantage over men when it comes to sense of smell.

Ans: T

Learning Objective: 2.3: Examine how signal detection processes are used to examine how sensory modalities interact with each other. Explain how masking works.

Cognitive Domain: Knowledge

Answer Location: In Depth: Signal Detection and Multisensory Processing

Difficulty Level: Easy

6. Masking occurs when two different senses are stimulated simultaneously.

Ans: F

Learning Objective: 2.3: Examine how signal detection processes are used to examine how sensory modalities interact with each other. Explain how masking works.

Cognitive Domain: Comprehension

Answer Location: In Depth: Signal Detection and Multisensory Processing

Difficulty Level: Easy

7. Neuroimaging allows scientists to correlate perception with brain activity.

Ans: T

Learning Objective: 2.4: Evaluate neuroscience methods and what they tell us about sensation and perception.

Cognitive Domain: Knowledge

Answer Location: In Depth: Signal Detection and Multisensory Processing

Difficulty Level: Easy

8. MEG produces better special maps of the brain than fMRI.

Ans: F

Learning Objective: 2.4: Evaluate neuroscience methods and what they tell us about sensation and perception.

Cognitive Domain: Comprehension

Answer Location: In Depth: Signal Detection and Multisensory Processing

Difficulty Level: Medium

9. Conductive hearing loss is permanent hearing loss caused by damage to the cochlea or auditory nerve.

Ans: F

Learning Objective: 2.5: Assess how audiologists and optometrists use psychophysical assessment tools to measure patients' hearing and visual abilities and, in some cases, help them find appropriate corrective measures.

Cognitive Domain: Knowledge

Answer Location: Application: Psychophysics in Assessment: Hearing Tests and Vision Tests

Difficulty Level: Easy

10. A Snellen chart is used as an initial screening for glaucoma and diabetic retinopathy.

Ans: F

Learning Objective: 2.5: Assess how audiologists and optometrists use psychophysical assessment tools to measure patients' hearing and visual abilities and, in some cases, help them find appropriate corrective measures.

Cognitive Domain: Knowledge

Answer Location: Application: Psychophysics in Assessment: Hearing Tests and Vision Tests

Difficulty Level: Easy

Short Answer

1. Akilah and her team want to develop a scale that rates the bitterness of chocolate. Bitterness is tied to the concentration of cocoa in the chocolate. Explain the test they should run in order to develop the scale. Be sure to explain both the physical and psychological dimensions of the test.

Ans: Akilah and her team could use a psychophysical scale to measure test subjects' experience of bitterness as they taste different concentrations of cocoa. The concentration of cocoa would be the physical dimension and the perception of bitterness would be the psychological dimension. The team would need to give tasters chocolate with a known concentration of cocoa, then test how much more concentrated the cocoa would need to be before the tasters noticed a difference.

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Application

Answer Location: Introduction

Difficulty Level: Hard

2. Explain how response expansion works, using an example to illustrate the concept.

Ans: Student examples will vary. A sample answer follows. Response expansion occurs when an increase in the strength of a stimulus is accompanied by a disproportionate increase in a person's perceptual response to it. For example, if someone hearing a loud sound ranks their discomfort at 2 out of 10 on a pain scale, doubling the volume would result in the person ranking their pain at more than double, or a number greater than 4.

Learning Objective: 2.1: Explain the nature of psychophysical scales and how they measure the relation of stimuli in the world and our perceptions of them.

Cognitive Domain: Application

Answer Location: Magnitude Estimation

Difficulty Level: Hard

3. Explain the relationship between criterion and sensitivity in signal detection theory.

Ans: In signal detection theory, *criterion* refers to an internal cutoff determined by an observer. The observer has one response for anything above this cutoff and another for anything below. *Sensitivity* refers to the ease or difficulty with which the observer can distinguish the signal from noise. The concepts are related. When sensitivity remains constant, criterion determines the ratio of hits to false alarms. For example, an observer with high sensitivity will generally have a high number of hits and correct rejections. However, if the same observer also has a low criterion, it can lead to many false alarms. Learning Objective: 2.2: Demonstrate an understanding of signal detection theory.

Cognitive Domain: Analysis

Answer Location: Signal Detection Theory

Difficulty Level: Medium

4. Compare and contrast electroencephalography (EEG) and magnetoencephalography (MEG). Be sure to include both similarities and differences in your analysis.

Ans: Both EEG and MEG detect rapid changes in the brain, and both can be used to make special maps of the brain. There are several important differences between these two technologies, however. EEG uses electrodes to detect brain signals, while MEG uses magnetic sensors to detect magnetic fields caused by the brain's electrical activity. EEG provides a more precise time scale for changes in the brain than MEG does, but MEG provides better special maps.

Learning Objective: 2.4: Evaluate neuroscience methods and what they tell us about sensation and perception.

Cognitive Domain: Analysis

Answer Location: In Depth: Signal Detection and Multisensory Processing

Difficulty Level: Hard

5. Explain how an audiologist evaluates a patient for hearing loss.

Ans: The audiologist will usually begin a hearing loss evaluation by using an audiometer to assess how well the patient hears. An audiometer is a device that gives off tones at different frequencies. The patient listens through headphones as the audiologist presents the tones. The audiologist records what the patient does and does not hear, and in which ear. The audiologist then creates an audiogram, a graph of the thresholds for each frequency measured. This graph is then used to determine if there is hearing loss at any frequency. If there is, the audiologist can fit the patient with hearing aids. If the audiologist suspects a medical issue, he or she may refer the patient to a medical doctor.

Learning Objective: 2.5: Assess how audiologists and optometrists use psychophysical assessment tools to measure patients' hearing and visual abilities and, in some cases, help them find appropriate corrective measures.

Cognitive Domain: Application

Answer Location: Application: Psychophysics in Assessment: Hearing Tests and Vision Tests

Difficulty Level: Medium