Sensation and Perception 2nd edition Harris Test Bank

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Chapter 1: The nature of perception, and some ways of investigating it

1. Researchers in perception study:

a. How the brain acquires information through the senses

b. The neurological basis of handedness

c. Why some things are easier to remember than others

d. None of these

Ans: A

2. Which of the following is not a Gestalt psychologist?

a. Koehler

b. Wertheimer

c. Koffka

d. Gibson

Ans: D

3. Which of the following is a Gestalt perspective on perception?

a. Bigger is always better

b. The whole is other than the sum of the parts

c. The whole is less than the sum of the parts

d. Perception relies on past experience

Ans: B

4. Which statement best captures Gregory's view of perception?

a. Percepts are accurate representations of the world

b. Percepts are like scientific hypotheses

c. Percepts are like weather forecasts

d. Perception does not involve cognition

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Ans: B

5. According to Gibson, the affordance of an object is?

a. The likely cost in the effort of manipulating it

b. Its natural place in the world

c. Its implicit suggestion of how to handle it

d. Its economic value

Ans: C

6. Which of the following is not a level of description in Marr's theory of vision?

a. Algorithmic

b. Computational

c. Physiological

d. Implementation

Ans: C

7. A motion coherence threshold is calculated from:

a. The proportion of elements moving in the same direction at the same velocity

b. The proportion of moving elements of the same contrast

c. The element with the lowest velocity

d. The proportion of stationary elements

Ans: A

8. In the elderly, motion coherence thresholds are higher (motion perception is worse) than in the young:

a. At higher speeds

b. At lower speeds

c. At all speeds

d. There is no difference at any speed

Ans: B

9. Adapting to vertical stripes:

a. Makes horizontal motion harder to see

b. Makes oblique stripes harder to see

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c. Makes faint vertical stripes harder to see

d. Makes everything harder to see

Ans: C

10. In serial visual search, reaction times:

a. Decrease with the number of elements in the display

b. Become more variable

c. Increase with the number of elements in the display

d. None of these

Ans: C

11. Perceptual learning in Vernier acuity has been studied by:

a. Change in contrast thresholds

b. Selective adaptation

c. Change in coherence thresholds

d. Transfer of training

Ans: D

12. The oblique effect is:

a. Misperception of a statement which is indirect

b. Lower sensitivity to oblique than to horizontal and vertical contours

c. Slower responses to things seen out of the corner of the eye

d. Misperception of body orientation when not upright

Ans: B

13. When hearing and vision provide conflicting information about the location of objects:

a. Visual information is always followed

b. Auditory information is always followed

c. Auditory information biases perceived location when visual information is imprecise

d. None of these

Ans: C

14. Which of the following brain regions is thought to be involved in synaesthesia?

a. Pre-cuneus

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b. Hippocampus

c. Frontal lobes

d. Hypothalamus

Ans: A

15. Measuring how changes in the apparatus affect the properties of the stimulus is known as:

a. Sensitization

b. Accommodation

c. Transduction

d. Calibration

Ans: D

16. The highest frequency which can be detected by a human with normal hearing is about:

a. 100 Hz

b. 5 kHz

c. 20 kHz

d. 50 kHz

Ans: C

17. The loudest sound which can be heard by a human without feeling pain is about:

a. 120 dB (SPL)

b. 50 dB (SPL)

c. 200 dB (SPL)

d. 80 dB (SPL)

Ans: A

18. The average luminance of the sky is about:

a. 100 cd m^{-2}

b. 1000 cd m^{-2}

c. 4000 cd m^{-2}

d. 400 cd m^{-2}

Ans: C

19. The size of visual stimuli is often expressed in:

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a. Centimetres

b. Candelas per square metre

c. Foot lamberts

d. Degrees of visual angle

Ans: D

20. The elements of which an image on a digital computer screen is composed are known as:

a. Textels

b. Pixels

c. Radians

d. Verniers

Ans: B

21. How is human vision different from the operation of a bar-code reader?

a. It transduces electromagnetic energy into electrical activity

b. It is usually accurate

c. It makes use of a large cache of stored knowledge

d. It is usually fast

Ans: C

22. Why is the Law of Similarity not a good explanation of perceptual grouping?

a. It is hard to understand

b. It is a re-description of the phenomena which it seeks to explain

c. There are experiments which disprove it

d. There are other perceptual laws which contradict it

Ans: B

23. JJ Gibson was especially interested in:

a. The perceptual control of actions

b. Visual illusions

c. Visual cognition

d. Brain mechanisms of perception

Ans: A

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24. Implementation (one of Marr's levels of explanation) must be different in principle in brains and digital computers because:

a. They have different energy requirements

b. One is made of metal, the other of living tissue

c. The computer is much faster than the brain

d. Neurons can be in one of many states, whereas the elements in a digital computer can be in one of only two states

Ans: D

25. An absolute threshold is:

a. A definition of a completely forbidden action

b. A measure of the faintest stimulus that can be detected

c. That part of personal space from which everyone else is excluded

d. The smallest difference between stimuli needed for reliable discrimination

Ans: B

26. Thresholds are a measure of which aspect of a perceptual system?

a. Its sensitivity

b. Its dynamic range

c. Its adaptability

d. Its ecological importance

Ans: A

27. In parallel visual search, reaction times:

a. Decrease with the number of elements in the display

b. Become more variable

c. Increase with the number of elements in the display

d. Do not vary with the number of elements

Ans: D

28. Ahissar and Hochstein suggested that during the early stages of perceptual learning:

a. Learning occurred in more central cognitive processes

b. Learning occurred in specific early visual mechanisms

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c. Learning was slow and tentative

d. Learning was not subject to interference

Ans: A

29. Contextual or top-down effects in perception are probably mediated at least to some extent by:

a. Lateral connections in the retina and cochlea

b. Reward signals in the brain

c. Feedback from later to earlier stages of perception

d. Cerebellar activity

Ans: C

30. Humans can detect the range of sound frequencies from about:

a. 1 Hz to 100 Hz

b. 20 Hz to 20 kHz

c. 5 kHz to 100 kHz

d. 20 kHz to 100 kHz

Ans: B

Short answer questions

1. Compare and contrast the views on the nature of perception of RL Gregory and JJ Gibson
2. How has motion perception changed in the elderly?
3. How have visual search tasks affected our view of visual attention?
4. How have experiments on perceptual learning influenced our view of plasticity in the adult brain?
5. How would you convince a sceptic who says that synaesthesia is just a product of a vivid imagination?

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Chapter 2: Research methods in perception

MCQs

1. Introspection is of limited value in understanding perception because:

a. Some perceptual processes are not available to consciousness

b. It is hard to describe what one perceives

c. People tend to make mistakes in their description of percepts

d. None of these

Ans: A

2. The Method of Adjustment is of limited value because:

a. There is a large variance in the responses

b. It confounds caution and sensitivity

c. It does not give repeatable results

d. It takes too much time

Ans: B

3. In a graph showing the Signal + Noise and the Noise distributions in Signal Detection Theory, the units on the *x*-axis are:

a. Criteria

b. Probabilities

c. Logarithms

d. Standard deviations

Ans: D

4. In Signal Detection Theory, the observer's criterion:

a. Is the value below which responses are rejections

b. Is the value above which responses are rejections

c. Is the value below which responses are hits

d. Is the value below which responses are incorrect

Ans: A

5. The psychometric function:

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a. Is the observer's motivation to do a task

b. Is a measure of the observer's personality

c. Is a graph plotting observer performance against stimulus value

d. Is the result of calibrating the apparatus

Ans: C

6. Performance in a 2AFC task is affected by:

a. Shifts of criterion

b. Lapses of attention

c. Slowness of response

d. None of these

Ans: B

7. A shortcoming of the Method of Constant Stimuli is that:

a. It encourages guessing

b. It produces Class B observations

c. It requires an initial guess by the experimenter about threshold value

d. It produces imprecise measures of threshold

Ans: C

8. Adaptive Methods make use of:

a. The history of the participant's responses

b. Random guessing

c. The experimenter's guess about the location of the threshold

d. The participant's criterion

Ans: A

9. Data obtained from Magnitude Estimation are:

a. Interval

b. Binary

c. Categorical

d. Ordinal

Ans: D

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10. Sensory evoked potentials are usually averaged:

a. To remove the effects of brain activity not related to the stimulus

b. To identify in which perceptual system they originate

c. To prevent experimenter bias

d. To eliminate criterion shifts

Ans: A

11. From the Auditory Evoked Potential, one can identify:

a. Lapses of attention

b. A native speaker of a language

c. Intrusive thoughts

d. The likely site of neural damage in the auditory system

Ans: D

12. Magnetoencephalography is conducted in a shielded room:

a. To prevent extraneous noises from interfering with the measurements

b. To prevent any danger to experimenters

c. To prevent interference with the signals from the brain by the magnetic field of the earth

d. To allow more precise stimulus presentation

Ans: C

13. Which of the following is not a disadvantage in fMRI?

a. Its temporal resolution

b. Restrictions on the individuals who may be scanned

c. A need to keep the participant stationary

d. Its spatial resolution

Ans: D

14. The units into which the brain is subdivided in the analysis of data from fMRI are known as:

a. Voxels

b. Pixels

c. Sulci

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d. SQUIDs

Ans: A

15. Which of the following is not a disadvantage in studying the effects of brain lesions in humans?

a. Over time, tissue surrounding the lesion may take over lost functions

b. A lesion may affect several functional areas

c. Patients' willingness to cooperate in studies

d. Patients may tire quickly

Ans: C

16. A receptive field is:

a. An individual's field of view

b. Part of the measurement process in fMRI

c. A dimension of personality

d. The array of sensory receptors within which stimulation causes changes in the activity of a sensory neuron

Ans: D

17. Repetitive transcranial magnetic stimulation with short (<5 ms) intervals between pulses:

a. Produces excitatory effects in neural tissue

b. Produces inhibitory effects in neural tissue

c. Is not recommended for experimental purposes in humans

d. Has no effect on neural tissue

Ans: B

18. Support for the Bayesian approach to perception has come from studies of:

a. Single neurons

b. Visual aftereffects

c. Cue combination

d. Masking

Ans: C

19. Artificial neural networks are composed of:

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a. Layers

b. Random couplings

c. Recursive loops

d. None of these

Ans: A

20. Artificial neural networks learn by:

a. Turning off some units

b. Adding more unit

c. Finding the most active unit

d. Changing the weights of inputs at each unit

Ans: D

21. Questionnaires can give useful information about:

a. Differences in perception between groups

b. Neural processing in the retina

c. Perceptual thresholds

d. Auditory cortex

Ans: A

22. In a two-alternative forced choice task:

a. The stimulus is always detectable

b. The participant never makes an error

c. The stimulus is always presented

d. Lapses of attention do not affect measures of performance

Ans: C

23. The slope of the psychometric function gives:

a. A measure of the observer's accuracy

b. A measure of the precision in the sensory system being investigated

c. The observer's criterion

d. None of these

Ans: B

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24. Magnitude Estimation is useful because:

a. It produces interval data

b. It is bias-free

c. It gives data which are normally distributed

d. It can be used to measure the perception of stimulus attributes which are hard to quantify

Ans: D

25. The EEG gives:

a. Excellent temporal resolution

b. Immunity to interference from electrical equipment

c. Excellent spatial resolution

d. Useful data from a single trial

Ans: A

26. Which of the following is not a disadvantage of PET?

a. Its temporal resolution

b. The need to inject a radioactive substance into participants

c. A need to keep the participant stationary

d. Its spatial resolution

Ans: D

27. In fMRI, the haemodynamic response is:

a. The pulse

b. The assumed change in blood flow associated with neural activity

c. The increase in heart rate produced by arousing stimuli

d. The unwanted changes in heart rate caused by scanner noise

Ans: B

28. Repetitive transcranial magnetic stimulation with intervals of 10 to 30 ms between pulses:

a. Produces excitatory effects in neural tissue

b. Produces inhibitory effects in neural tissue

c. Is not recommended for experimental purposes in humans

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d. Has no effect on neural tissue

Ans: A

29. Broca examined post-mortem the brains of patients who had problems in speaking but not in understanding speech. He found lesions in the:

a. Right parietal lobe

b. Left occipital lobe

c. Left temporal lobe

d. Lateral left frontal lobe

Ans: D

30. A problem with applying the Bayesian approach to perception is that:

a. Perception has a random element

b. It is sometimes difficult to ascertain prior probabilities

c. Likelihoods are often equal

d. It imposes unlikely constraints

Ans: B

Short answer questions

1. What are the advantages and disadvantages of the Method of Adjustment and a two-alternative Forced Choice task as ways of measuring sensory thresholds?
2. To what extent do adaptive psychophysical methods overcome the disadvantages of other methods?
3. Describe TMS and give an example of its use in experiments.
4. Why is fMRI-A a useful technique? Give an example of its use.
5. Compare and contrast single cell recording in animals and the study of humans with brain damage as ways of studying brain function.

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Chapter 3: Mechanisms of early and middle visual processing

MCQs

1. The component of the human eye with the greatest optical power is the:

a. Lens

b. Pupil

c. Vitreous

d. Cornea

Ans: D

2. The light-sensitive surface in the eye is known as the:

a. Retina

b. Choroid

c. Sclera

d. Zonule

Ans: A

3. Which of these does not affect pupil diameter?

a. Luminance level

b. Cognitive demands

c. Interest

d. Vitreous humour

Ans: D

4. The outer nuclear layer of the retina contains:

a. The cell bodies of the photoreceptors

b. The amacrine cells

c. The choroid

d. The cell bodies of the bipolar cells

Ans: A

5. Retinal rods are most dense:

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a. In the fovea

b. In the macula

c. 15–20° from the fovea

d. At the blind spot

Ans: C

6. The fibres in the optic nerve number about:

a. 6 million

b. 120 million

c. 150,000

d. 1 million

Ans: D

7. In dark adaptation, the rod-cone break:

a. Lies about 15° from the fovea

b. Occurs when rods become more sensitive than cones

c. Is a symptom of night-blindness

d. Is related to pupil diameter

Ans: B

8. Compared with cones, the peak sensitivity of rods is shifted towards:

a. Longer wavelengths

b. Shorter wavelengths

c. Flicker

d. The fovea

Ans: B

9. Parasol ganglion cells are:

a. P cells

b. K cells

c. M cells

d. Driven only by rods

Ans: C

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10. Experiments with monkeys suggest that P cells respond to:

a. Line orientation

b. Flicker

c. Binocular disparity

d. Motion

Ans: A

11. The input layer in V1 is:

a. Layer 5

b. Layer 3

c. Layer 4

d. Layer 1

Ans: C

12. Visual area V6 forms part of the:

a. Dorsal stream

b. Ventral stream

c. K layers of the LGN

d. Cerebellum

Ans: A

13. After staining visual cortex with cytochrome oxidase, pale stripes are found in:

a. V1

b. V2

c. V5/MT

d. V4

Ans: B

14. Area V2 contains cells which respond to:

a. Arcs

b. Stars

c. Components of natural scenes

d. All of these

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Ans: D

15. Which of the following has not been suggested as a role of V4?

a. Figure/ground segregation

b. Detection of discontinuities of texture

c. Detection of complex object features

d. Motion perception

Ans: D

16. After lesions to the temporal lobe, monkeys cannot:

a. Discriminate visually between wooden blocks of different shapes

b. Use a wooden block as a cue to the location of food

c. Reach for a wooden block

d. Place a wooden block in a hole

Ans: A

17. Which of the following has not been shown to be reliable cues for segmentation?

a. Differences of element colour

b. Differences of element orientation

c. Differences in number of line endings of elements

d. Differences of direction of motion of elements

Ans: C

18. Analysis of external space takes place in:

a. The ventral stream

b. The cerebellum

c. The koniocellular layers of the LGN

d. The dorsal stream

Ans: D

19. Functions of the Superior Parietal Lobule include:

a. Perception of colour

b. Control of actions

c. Memory for form

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