

Problem 1. Learning & Memory (1.5 points)

A. (0.4 point) Explicit Memory

- a. Define both episodic and semantic memory (in a sentence or two each).

Episodic memory: memory for events and personal experience

Semantic memory: memory for facts

- b. Give an example of each of these two kinds of memory (in a sentence or two).

Examples easy to find;

- c. Which broader category of memory do they fall under? (one or two words)

They both belong to explicit memory.

- d. Where would a brain lesion most specifically impair episodic memory? (name the brain region/structure)

Episodic: lesions in hippocampus, association areas of frontal lobe

- e. Where would a brain lesion most specifically impair semantic memory?

Semantic: lesions in several distributed regions in neocortex, esp temporal cortex; since semantic memory is stored in distributed regions.

B. (0.6 point) Implicit Memory

- a. (0.2point) Label the following forms of learning as either associative or non-associative:

sensitization – non-associative

habituation – non-associative

classical conditioning – associative

operant conditioning – associative

- b. (0.4 points) Provide a short paragraph each describing an example of how one would demonstrate each of the above 4 forms of memory experimentally. Describe what you would do and what you would measure in the experiment, and be sure to explain how your particular description makes this kind of memory different from the others.

Habituation: reduced response to repetitive stimuli, such as reduced startle response to repetitive sound stimuli.

Sensitization is basically the opposite of habituation.

Classic conditioning: the association of an unconditioned stimulus and a conditioned stimulus, such as Pavlov's dog experiment, etc.

Operant conditioning: the association of a particular behavior and a stimulus (consequence), such as animals learn to push a lever for food, etc.

PS6 Answer Key

C. (0.1 point) In humans, what is the most obvious difference in retrieval of the two major memory forms described in part A and part B?

Recall of explicit memory is typically accompanied by conscious experience of the memory itself whereas recall of implicit memory is not.

D. (0.4 point) Stages of memory

- a. Name and briefly describe four distinct stages in time at which learning and memory operate.

Four stages: encoding (learning new information); consolidation (processes by which newly formed information perseverates); storage (retaining memory over time) and retrieval (recalling stored information). Reconsolidation is also a possible answer.

- b. What is the difference between iconic, working (short-term), and long-term memory? Include in your answer the time scale over which each of these different forms of memory is active and the brain region(s) thought to be involved in humans.

Iconic: short-time sensory memory, usually <1sec; not sure where it is stored but maybe in sensory organ/cortex;

STM: declarative memory, usually ~30sec; requires frontal lobe, parietal lobe, etc;

LTM: longer than STM; formation requires hippocampus and stored in distributed regions across cortex.

Problem 2:

No key was written due to the breadth of possible answers.

PS6 Answer Key