

PSYC371 Test 1 Practice Questions

1. Which of the following statements is true about the motor area hierarchy?
 - a. Like the representational hierarchy, the motor hierarchy is organized from abstract to simple.
 - b. The motor area hierarchy contains the orbitofrontal cortex, the dorsolateral prefrontal cortex, the premotor area, the hippocampus and the primary motor cortex.
 - c. The OFC contains a cognitive map that represents and tracks rewarding goals and destinations, informing goal-directed and flexible decision-making.
 - d. None of the above
2. The orbitofrontal cortex receives multiple inputs, including:
 - a. The amygdala, which provides instinctual information such as fear, hunger and thirst.
 - b. The hypothalamus, which provides homeostatic information about the body's internal state.
 - c. The olfactory and gustatory systems, which provide information about the environment.
 - d. Two of the above.
 - e. All of the above.
3. EVR is an important case study demonstrating the effects of a PFC lesion. Which of the following statements about his case study is false?
 - a. Following an orbital meningioma removal surgery, EVR experienced adjustment issues which his doctors thought were independent of organic damage.
 - b. EVR tested poorly in psychological tests after the surgery, showing significant reductions in figure reproduction.
 - c. EVR's case shows a discrepancy between his standardized testing results and everyday behaviour in the real world.
 - d. Patients like EVR display reduced physiological responses to loss in the Iowa gambling task, potentially due to damage in the orbitofrontal cortex.
 - e. Two of the above.
4. Which of the following statements is true regarding the orbitofrontal cortex?
 - a. The amygdala-OFC input is needed to update values and flexibly achieve awards.
 - b. By lesioning the OFC and AMY ipsilaterally, researchers can observe the role of the AMY-OFC input on rodent behaviour.
 - c. OFC-lesioned rats are generally capable of learning the unstaked rodent gambling task.
 - d. Patients with OFC damage generally do not perservate in the stacked Iowa gambling task.
 - e. Two of the above.
5. Which of the following is true regarding working memory?
 - a. One brain region involved in working memory is the DLPFC, which can be active without specifically planning for movement.

- b. Delayed response tasks still fail to separate the intention from the motor act, making the study of working memory difficult.
 - c. Items may be held in working memory through persistent neural firing due to reverberatory network activity, local excitatory loops or mutual inhibition networks.
 - d. Synaptic plasticity supports working memory by creating long-lasting structural changes that encode past events, enabling automatic activation of relevant processes by future cues.
 - e. Two of the above.
- 6. The parietal cortex is involved in the control of movement. Which of the following is NOT true about its contributions?
 - a. The anterior intraparietal region determines relevant affordances for object interaction.
 - b. The parietal cortex processes dorsal stream information, providing insights into spatial relationships between objects.
 - c. Neurons in the parietal cortex may represent an early stage of a peripersonal spatial map and are unimodal in nature.
 - d. The activation of single neurons in the parietal cortex varies with the goal of the motor act.
- 7. Which of the following statements are true regarding the premotor cortex?
 - a. F5 neurons discharge during the execution of certain motor acts.
 - b. Canonical neurons respond when grasping but not while observing the object.
 - c. Set-related neurons fire in the absence of motion.
 - d. Premotor lesions produce contralateral spatial neglect.
 - e. Two of the above.
- 8. The model of sensory-motor transformation proposes that:
 - a. The OFC, DLPFC and striatum inform action selection in the motor cortex.
 - b. Ventral stream information is important for the execution of proper movement.
 - c. The motor cortex recruits specific motor cortex neurons, spinal motor neurons, interneurons and border neurons.
 - d. The anterior intraparietal region identifies affordances via the dorsal stream.
 - e. Two of the above.
 - f. Three of the above.
- 9. Regarding the motor cortex,
 - a. Physiologists found that cortical stimulation near the central sulcus of patients could evoke ipsilateral movement.
 - b. Lateral axonal connections in M1 allow the coordination of related muscles.
 - c. The discharge of M1 neurons varies according to movement type and is specific to the contralateral arm.
 - d. The motor cortex is topographically organized, with adjacent body parts always represented adjacently.
 - e. Two of the above
- 10. Viscous curl experiments demonstrate motor learning. Which of the following is false?

- a. Kinematic neurons represent the desired movement kinematics throughout the task.
 - b. Dynamic neurons display direction changes according to the applied force and continue reflecting this direction after washout.
 - c. Memory neurons keep a record of the kinematics required to counteract the viscous curl for future reference.
 - d. A force pushes the arm in a direction perpendicular to movement, deflecting it to the side.
11. Regarding the whisker and forelimb areas of a rat, researchers found that:
- a. After facial motor nerve transection, stimulating the whisker area evoked forearm relaxation.
 - b. Changes in inhibitory circuits can rapidly evoke neuroplastic changes in the motor map.
 - c. Blocking the glutamatergic interneuron synapsing onto the forelimb neuron leads to forearm contraction due to reduced inhibitory input.
 - d. Two of the above.
12. Regarding neuroplasticity, which of the following is false?
- a. Optogenetic experimentation has identified structural correlates of motor learning with the examination of dendritic spines.
 - b. Optogenetic stimulation in the AS-PaRac1 experiment increased the size of potentiated spines, corresponding with enhanced motor learning.
 - c. The size of motor maps relevant to retrieval corresponds with the monkey's success rate.
 - d. When one region of the motor map expands with experience, other regions may shrink to compensate.
 - e. None of the above.