Cognition 7th edition Radvansky Test Bank

SKU: 9780134478029-TEST-BANK

Chapter 2: Cognitive Neuroscience

Chapter Context

This chapter provides a basic understanding of the fundamental principles of neural processing and various brain structures that are important for a wide range of cognitive processes. We cover some of the major methods of assessing how the neural processing corresponds to cognitive processing, as well as the neural network.

Outcome-based Outline

Outcome	**Learning Objectives**
Critical Thinking	2.5 Summarize connectionism as a computer-based method in cognitive science
Knowledge of Discipline	2.2 Describe the functionality of neurons
	2.4 Describe the four ways of understanding the human brain
Information Literacy	2.1 Examine the neurological connection of cognition
	2.3 Identify the neural anatomy of the human brain

Discussion Question Bank

This discussion question bank provides a listing of discussion questions (1–2 per module), which are included for in-class use.

Module	**Discussion Question(s)**
2.1 The Brain and Cognition Together	1 Many stroke patients who have lost the ability to speak (i.e., an acquired language disability called "aphasia") can accurately produce words when singing familiar songs. Discuss the surprising phenomenon in terms of the neurological substrates of cognition.
2.2 Basic Neurology	1. Use the example of an athlete running on a cross-country or rough terrain course as an analogy for elements in the nervous system. For example, the myelin sheath, which is involved in transmission speed, might be likened to trees or shrubs along some parts of the running course that shield the runner from wind allowing a faster running pace. Account for as much of the process as possible using this analogy. 2. Give two or three examples of memory content that, for you, appeared to become more permanent over time. Describe how you believe this content became consolidated in your memory system.

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2.3 Important Brain Structures and Function	1. What smell(s) most reminds you of home or your family? Which brain component(s) is responsible for the association you have between the smell and your home or family? Why do you think smells are able to evoke memories related to strong emotions? 2. Imagine kicking a soccer ball over a fence. Think about writing a letter on paper with a pen. Envision yourself lying on a couch and rolling over without falling off. While engaged in any of these mental experiences, did you almost feel twitching in your legs, hands, or body? Which brain component is responsible for the twitching that may have occurred during visualization of movement? Explain your answer.
2.4 Neuroimaging	1. Describe the ways in which anatomy may be studied in healthy, living brains. Which approach(es) seems to have the greatest utility for learning about the brain structures that are responsible for activities like perception, reasoning, problem solving, and so forth? Explain your response. 2. Imagine that funding for brain research needed to be restricted to one of the following: CT and MRI studies, PET and fMRI studies, or direct stimulation studies. You are responsible for determining which type(s) of studies will be supported. Which option do you believe would help cognitive psychologists and cognitive scientists learn the most about complex cognitive processes? Explain your answer.
2.5 Connectionism	1. Provide an example of cognitive processes that occur for you in parallel. In other words, can you think of an activity or two that require parallel mental processes? Describe how the cognitive processes operate simultaneously and discuss what would happen to one process when the other, parallel process becomes more difficult. 2. Select a topic, such as rocking chairs, and think about them—then let your mind wander. Stop yourself after a few minutes and carefully trace your way back through your thoughts from where you ended to where you started. Use this mind wandering experience as an example to illustrate the connectedness of knowledge. Describe how your mind wandered from idea to idea in terms of excitatory or inhibitory connections and how one likely influenced the others.

Research Assignments

The following research assignments pertain to the main topics and/or themes of the chapter. Please respond by writing a paper consisting of 1,000–1,500 words.

Brain Lobes and Cognitive Functioning

The brain is comprised of four lobes: frontal, temporal, parietal, and occipital. Choose one lobe and research the cognitive elements for which it is responsible. Write a report that

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elaborates the contributions of the selected lobe to cognitive processing. Be sure to include examples of how damage to the selected lobe impairs cognitive functioning.

Lecture Suggestions

Lecture Suggestions (Effectiveness/Student Reactions)

- This chapter covers a lot of information. Be sure to indicate what your desired level of to-be-retained knowledge is.
- Request (and respond to) feedback. Hand out a sheet of paper and have each student (anonymously, if they wish) answer each of four preprinted questions:

1) What would you like to learn in this course?
2) Which course requirements are of most concern to you? (e.g., interpreting data, technical writing, etc.)
3) What is most likely to prevent you from performing at a level of excellence?
4) What can be done to enable you to meet these challenges?

Lecture Suggestions (Content)

Basic Tools

- Illustrate (via example or video) lesion/imaging techniques and their associated behavioral observations.
- To make it clear that the mind depends on the brain, discuss cases in which brain damage has affected thinking in some form or another.

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