Test Bank for Cognitive Psychology and Its Implications 9th Edition by Anderson

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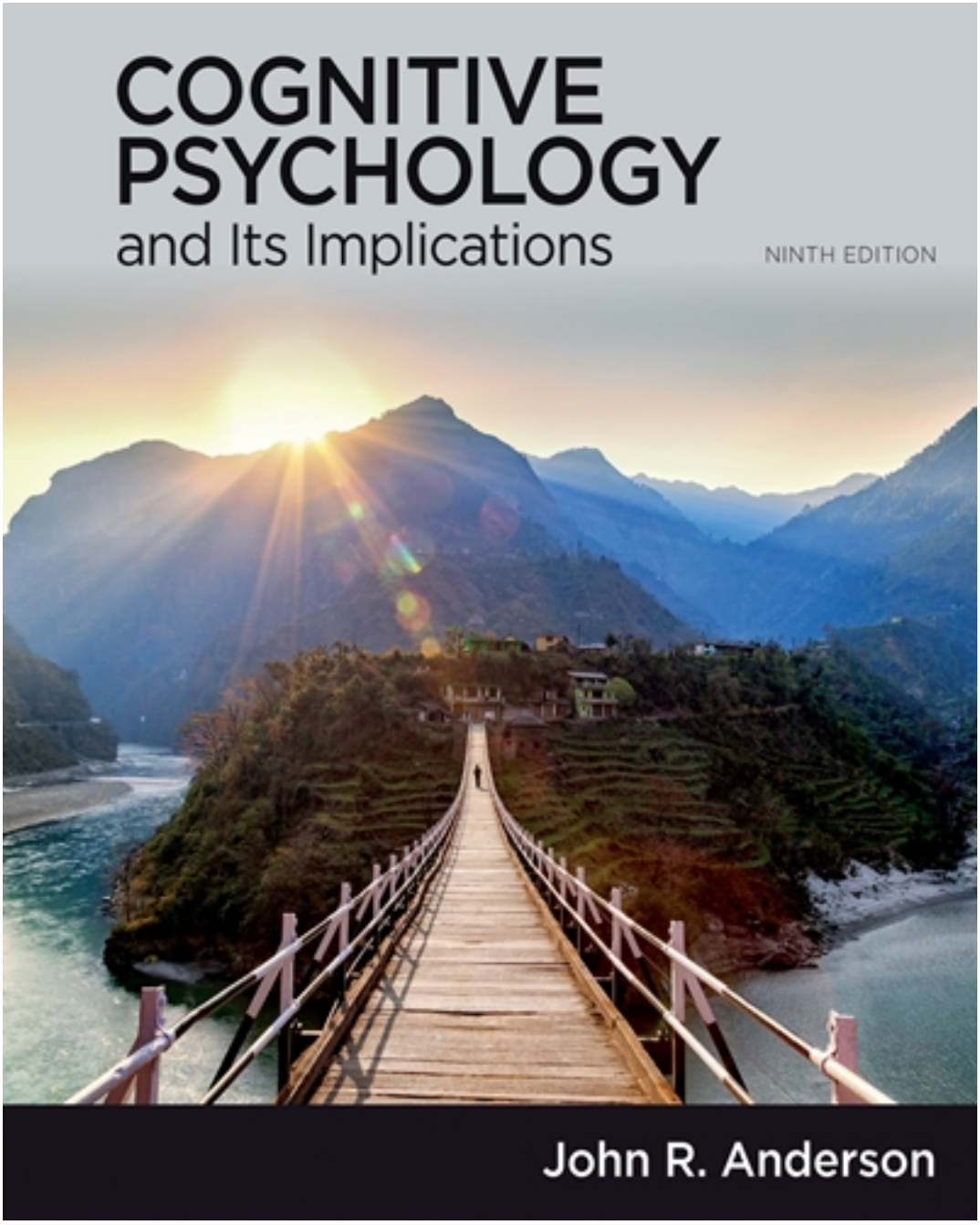

Test Bank

Name:_____ Class:_____ Date:_____

Chapter 01: True/False

1. Artificial intelligence researchers have created a program that matches human intelligence.
   a. True
   b. False

ANSWER: False

2. A current successful application of cognitive psychology is its contributions to our understanding of brain disorders that reflect abnormal functioning, such as schizophrenia.
   a. True
   b. False

ANSWER: True

3. Gestalt psychologists believe that the activity of the mind is more than the sum of its parts.
   a. True
   b. False

ANSWER: True

4. In the two decades between 1950 and 1970, cognitive psychology developed as a field by embracing behaviorism.
   a. True
   b. False

ANSWER: False

5. Cognitive neuroscience is the study of how cognition is realized in the brain.
   a. True
   b. False

ANSWER: True

6. Information-processing analysis breaks a cognitive task down into a set of steps.
   a. True
   b. False

ANSWER: True

7. From an information-processing point of view, the MOST important components of the nervous system are the neurons.
   a. True
   b. False

ANSWER: True

8. The terminal boutons of one neuron touch the dendrite of another.
   a. True
   b. False

ANSWER: False

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Chapter 01: True/False

9. There is a great deal of growth of new neurons and new synapses in the adult brain.
   a. True
   b. False

ANSWER: False

10. Coarse coding, an aspect of neural information processing, implies that single neurons seem to respond to only specific events.
   a. True
   b. False

ANSWER: False

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Chapter 01: Multiple Choice

1. The ancient Greek philosopher Aristotle believed that the mind was contained in the:
   a. brain.
   b. heart.
   c. lungs.
   d. stomach.

ANSWER: b

2. Nobel Prize winner, Herbert Simon, found that many of the basic cognitive processes studied in cognitive psychology are _____.
   a. to do with memory
   b. to do with linguistics
   c. to do with problem solving
   d. devoid of any biological components

ANSWER: c

3. Much social science has developed without grounding in cognitive psychology because:
   a. there was no interest in the field of cognitive psychology.
   b. research in this area is very cumbersome.
   c. the field of cognitive psychology really only began in the 1950s.
   d. there was a lack of research funding in this field.

ANSWER: c

4. The text recommends the PQ4R study technique for better retention of material, where the acronym PQ4R means:
   a. Peruse, Question, Recognize, Retrieve, Reflect, Review
   b. Practice, Quiz, Recognize, Retrieve, Reflect, Review
   c. Preview, Question, Read, Reflect, Recite, Review
   d. Persevere, Quiz, Read, Reflect, Recite, Review

ANSWER: c

5. According to _____, all knowledge comes from experience.
   a. empiricism
   b. nativism
   c. relativism
   d. verticality

ANSWER: a

6. According to _____, children come into the world with a great deal of innate knowledge.
   a. empiricism
   b. horizontality
   c. nativism

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Chapter 01: Multiple Choice

d. relativism

ANSWER: c

7. Why wasn't cognitive psychology a field of focus before the 19th century?
   a. Before the 19th century, most sciences remained largely undeveloped.
   b. It was believed that the human mind could not be scientifically studied.
   c. Questions about the human mind were not asked before the 19th century.
   d. The equipment needed to conduct research had not yet been invented.

ANSWER: b

8. Who established the first psychology laboratory?
   a. James
   b. Thorndike
   c. Watson
   d. Wundt

ANSWER: d

9. _____ refers to reporting the contents of one's own consciousness under carefully controlled conditions.
   a. Behaviorism
   b. Gestalt psychology
   c. Introspection
   d. Relativism

ANSWER: c

10. According to _____, psychologists should NOT try to analyze the working of the mind.
   a. behaviorism
   b. empiricism
   c. Gestalt psychology
   d. nativism

ANSWER: a

11. The claims of Gestalt psychologists, that the activity of the brain and the mind was more than the sum of its parts, conflicted with the _____ program that tried to analyze conscious thoughts into its parts.
   a. behaviorist
   b. introspectionist
   c. functionalist
   d. psychoanalytic

ANSWER: b

12. Cognitive science does NOT integrate research efforts from which field?
   a. physics

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b. linguistics
c. neuroscience
d. philosophy

ANSWER: a

13. Developments in which field did NOT influence the emergence of cognitive psychology?
a. artificial intelligence (AI)
b. Internet technology
c. information theory
d. linguistics

ANSWER: b

14. The dominant approach to studying human cognition is the:
a. information-processing approach.
b. phonological-loop approach.
c. information-stage approach.
d. information-analysis approach.

ANSWER: a

15. What term describes experimental results reported with p-values below 0.05 that are not replicated when the experiments are repeated?
a. replicability rejection
b. replicability mismatch
c. replicability dilemma
d. replicability crisis

ANSWER: d

16. The field of cognitive neuroscience focuses on how cognition is realized in the:
a. brain.
b. neurons.
c. glial cells.
d. peripheral nervous system.

ANSWER: a

17. The main function of _____ is thought to be supportive of the neurons.
a. motor neurons
b. sensory neurons
c. inter-neurons
d. glial cells

ANSWER: d

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Chapter 01: Multiple Choice

18. Components of the neuron include the:
    a. axon, dendrite, and ganglia.
    b. axon, dendrite, and soma.
    c. axon, ganglia, and soma.
    d. dendrite, ganglia, and soma.

ANSWER: b

19. The main body of the neuron is called the:
    a. axon.
    b. dendrite.
    c. soma.
    d. synapse.

ANSWER: c

20. A synapse is the:
    a. point at which an axon from one neuron touches the dendrite of another.
    b. point at which a dendrite from one neuron touches the dendrite of another.
    c. space shared by an axon from one neuron and a dendrite from another.
    d. space shared by a dendrite from one neuron and a dendrite from another.

ANSWER: c

21. The cerebellar Purkinje cell is a variety of:
    a. motor neurons.
    b. sensory neurons.
    c. neurons.
    d. glial cells.

ANSWER: c

22. Cells of the nervous system communicate by releasing chemicals called:
    a. dendrites.
    b. hormones.
    c. neurotransmitters.
    d. syno-transmitters.

ANSWER: c

23. _____ form the fixed pathways by which neurons transmit action potentials.
    a. Axons
    b. Dendrites
    c. Somas
    d. Muscles

ANSWER: a

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Chapter 01: Multiple Choice

24. Excitatory synapses:
    a. decrease the potential difference between the inside and the outside of a neuron.
    b. increase the potential difference between the inside and the outside of a neuron.
    c. do not change the potential difference between the inside and the outside of a neuron.
    d. can either increase or decrease the potential difference between the inside and the outside of a neuron.

ANSWER: a

25. Inhibitory synapses:
    a. decrease the potential difference between the inside and the outside of a neuron.
    b. increase the potential difference between the inside and the outside of a neuron.
    c. do not change the potential difference between the inside and the outside of a neuron.
    d. can increase or decrease the potential difference between the inside and the outside of a neuron.

ANSWER: b

26. An axon's _____ of firing determine(s) how it will affect nearby cells to which it synapses.
    a. intensity
    b. pattern
    c. rate
    d. intensity, pattern, and rate

ANSWER: c

27. A bulge in the cortex is called a(n):
    a. aphasia.
    b. gyrus.
    c. sulcus.
    d. synapse.

ANSWER: b

28. A crease passing between gyri is called a(n):
    a. aphasia.
    b. gyrus.
    c. sulcus.
    d. synapse.

ANSWER: c

29. Which of these lobes is NOT cortical?
    a. arterial
    b. frontal
    c. parietal

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Chapter 01: Multiple Choice

d. temporal

ANSWER: a

30. The primary visual areas are contained in the _____ lobe.
a. frontal
b. occipital
c. parietal
d. temporal

ANSWER: b

31. Spatial processing occurs in the _____ lobe.
a. frontal
b. occipital
c. parietal
d. temporal

ANSWER: c

32. The _____ lobe is involved in object recognition.
a. frontal
b. occipital
c. parietal
d. temporal

ANSWER: d

33. Higher-level processes, such as planning, are controlled by the _____ lobe.
a. frontal
b. occipital
c. parietal
d. temporal

ANSWER: a

34. The _____ portion of the brain is disproportionately larger in primates than in most mammals.
a. frontal
b. occipital
c. parietal
d. temporal

ANSWER: a

35. Brodmann (1909/1960) identified _____ distinct regions of the human cortex based on differences in the cell types in various regions.
a. 18

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b. 25
c. 37
d. 52

ANSWER: d

36. The _____ appears to be critical for human memory.
a. frontal lobe
b. hippocampus
c. hypothalamus
d. prefrontal cortex

ANSWER: b

37. Damage to the _____ results in amnesia.
a. amygdala
b. hippocampus
c. hypothalamus
d. thalamus

ANSWER: b

38. Which structure or structures is/are involved in motor functioning?
I. the basal ganglia
II. the cerebellum
III. the frontal lobe
a. II
b. I and II
c. II and III
d. I, II, and III

ANSWER: d

39. The left hemisphere is associated with _____ processing.
I. analytic
II. linguistic
III. perceptual
IV. spatial
a. II
b. IV
c. I and II
d. II and IV

ANSWER: c

40. The right hemisphere is associated with _____ processing.
I. analytic

Chapter 01: Multiple Choice

II. linguistic
III. perceptual
IV. spatial

a. I
b. IV
c. I and III
d. III and IV

ANSWER: d

41. The left hemisphere and the right hemisphere of the cerebral cortex are connected by the:

a. amygdala.
b. basal ganglia.
c. corpus callosum.
d. medulla oblongata.

ANSWER: c

42. Jesse is a researcher working with split-brain patients. He presents a complex command to one patient in the right ear (the right-ear patient) and presents the same complex command to another patient in the left ear (the left-ear patient). Jesse finds that:

a. the left-ear patient displays full comprehension, while the right-ear patient does not.
b. the right-ear patient displays full comprehension, while the left-ear patient does not.
c. both patients display full comprehension.
d. neither patient displays full comprehension.

ANSWER: b

43. Billy and Mac were in a car accident. Oddly, Billy suffered damage to Broca's area, while Mac suffered damage to Wernicke's area. As a result:

a. Billy suffered from language deficits, while Mac suffered from visual deficits.
b. Billy suffered from visual deficits, while Mac suffered from language deficits.
c. both suffered from language deficits.
d. both suffered from visual deficits.

ANSWER: c

44. Nick speaks in short, ungrammatical sentences. He might have _____ aphasia.

a. Basal's
b. Broca's
c. Sternberg's
d. Wernicke's

ANSWER: b

45. Sharon speaks in fairly grammatical sentences that are almost devoid of meaning. She might have _____ aphasia.

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Chapter 01: Multiple Choice

a. Basal's
b. Broca's
c. Sternberg's
d. Wernicke's

ANSWER: d

46. Hemispheric specialization of the brain:
a. occurs in all species.
b. occurs in all primates.
c. occurs only in humans.
d. has been studied only in humans.

ANSWER: c

47. _____ records the electrical potentials that are present on the scalp.
a. EEG
b. fMRI
c. MRI
d. PET

ANSWER: a

48. Victor is a neuroscientist. The imaging technique that he is using has very good temporal resolution but isn't very useful at identifying the location in the brain that is producing neural activity. This technique is called:
a. ERP.
b. fMRI.
c. MRI.
d. PET.

ANSWER: a

49. _____ is BEST at detecting activity in the sulci of the cortex and is less sensitive to activity in the gyri or activity deep in the brain.
a. EEG
b. fMRI
c. MEG
d. PET

ANSWER: c

50. In _____, a radioactive tracer is injected into the bloodstream.
a. EEG
b. fMRI
c. MEG
d. PET

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ANSWER: d

51. _____ relies on the fact that there is more oxygenated hemoglobin in regions of greater neural activity.
    a. EEG
    b. fMRI
    c. MEG
    d. PET

ANSWER: b

52. The body sends more blood to more active areas of the brain. This is referred to as the:
    a. hemodynamic response.
    b. hemoglobin response.
    c. MRI effect.
    d. PET effect.

ANSWER: a

53. The hemodynamic response to a neural activity reaches a peak about:
    a. 4 to 5 s before the event.
    b. 4 to 5 s after the event.
    c. simultaneously with the event.
    d. 10 s after the event.

ANSWER: b

54. Transcranial magnetic stimulation is used to:
    a. generate the magnetic fields read by MRIs.
    b. permanently incapacitate an overactive brain region.
    c. temporarily incapacitate a normal-functioning brain region.
    d. reactivate a brain region that has suffered mild damage.

ANSWER: c

55. More research in psychology is now aimed at trying to understand:
    a. the function of a particular brain structure.
    b. the function of neurotransmitters.
    c. the function of hormones in determining behavior.
    d. the function of drugs on the brain.

ANSWER: a

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Chapter 01: Short Answer

1. Why has social science developed without grounding in cognitive psychology?

ANSWER: Two main reasons are given in the text. The first reason is that the field of cognitive psychology is not that advanced yet. The second reason is that researchers in other areas of social science have found other explanations for phenomena they study (apart from the potential explanatory contributions of cognitive psychology).

2. Differentiate between empiricism and nativism.

ANSWER: Empiricism and nativism are both philosophical positions that have potential implications for the study of human cognition. Empiricism is the view that all knowledge comes from experience. Nativism is the view that children are born into the world with a great deal of innate knowledge.

3. How did American introspection differ from German introspection?

ANSWER: German introspection involved an intense analysis of the contents of the human mind. This analysis was conducted by highly trained observers reporting the contents of their own consciousness under carefully controlled conditions. American introspection differed, however, in that it was not implemented as intensely. It involved a relatively more casual and reflective process of observing one's thoughts and consciousness. As a result, various laboratories in America were reporting different results from introspection with results tending to reflect the theory of that particular laboratory.

4. Describe the conflict among introspectionists, behaviorists, and Gestalt psychologists.

ANSWER: Introspectionists, behaviorists, and Gestalt psychologists had conflicts regarding how human behavior and/or cognition should be studied. Introspectionists used a method of inquiry called "introspection" that involved highly trained observers reporting the contents of their own consciousness under carefully controlled conditions. An underlying assumption of this method was that the workings of the human mind should be open to self-observation. Behaviorists strongly disagreed with this view, as they rejected introspection as a worthwhile method. To the contrary, they believed that psychology should only study external, observable behavior rather than the inner workings of the mind. Gestalt psychologists claimed that the activity of the brain and the mind was more than the sum of its parts. Thus, they were criticized by behaviorists for studying thought and consciousness at all. They also differed from introspectionists in that they sought to study the brain and mind holistically rather than analyzing the parts of conscious thought.

5. Describe Thorndike's view on introspection.

ANSWER: Thorndike ignored introspection, as he believed that conscious experience "was just excess baggage that could be largely ignored."

6. Differentiate between cognitive psychology and cognitive science.

ANSWER: The fields of cognitive psychology and cognitive science overlap, though they also have their differences. Cognitive psychology relies heavily on experimental techniques for studying behavior that grew out of the behaviorist era. Cognitive science makes greater use of such methods as logical analysis and the computer simulation of cognitive processes.

7. What is a synapse?

ANSWER: A gap separates the terminal bouton of a neuron and the dendrite of the receiving/receptor neuron and is typically in the range of 10 to 50 nanometers (nm). This near contact between axon and

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Chapter 01: Short Answer

dendrite is called a synapse.

8. How do neurons represent information?

ANSWER: Evidence suggests that individual neurons respond to specific features of a stimulus. For instance, some neurons are most active when there is a line in the visual field at a particular angle, while other neurons respond to more complex sets of features.

9. What is the function of the spinal cord?

ANSWER: The main function of the spinal cord is to carry motor messages from the brain to the muscles and sensory messages from the body to the brain.

10. Why is the human cortex convoluted?

ANSWER: The human cortex can be thought of as a rather thin neural sheet with a surface area of about 2,500 cm^2. Its convolutions, the large amount of folding and wrinkling, allow it to fit into the skull.

11. Describe the functions of the four lobes of the brain.

ANSWER: The occipital lobe contains the primary visual areas, and its main function is vision. The parietal lobe's functions include some perceptual functions (including spatial processing and representations of the body) and control of attention. The temporal lobe receives input from the occipital lobe, and it is involved in object recognition as well as language processing. The frontal lobe has two major functions: motor functions and higher-level processes, such as planning (these higher-level processes are localized specifically in the prefrontal cortex).

12. Describe the specializations of each hemisphere of the brain.

ANSWER: In general, the left hemisphere is associated with linguistic and analytic processing, while the right hemisphere is associated with perceptual and spatial processing.

13. Where in the brain are the amygdala and hippocampus located, and what are their functions?

ANSWER: The amygdala and the hippocampus are located inside the temporal lobe in each hemisphere. The amygdala is involved in emotional responses, and the hippocampus appears to be critical to human memory. Damage to these structures results in deficits of their functions.

14. Differentiate between Broca's aphasia and Wernicke's aphasia.

ANSWER: People suffering from Broca's aphasia typically have damage to Broca's area (in the left cortex of the brain). They have a form of aphasia that results in their speaking in short, ungrammatical sentences. People with Wernicke's aphasia typically have damage to Wernicke's area (also in the left cortex of the brain). They have a form of aphasia that results in their speaking in fairly grammatical sentences that are almost devoid of meaning. They usually have difficulty with vocabulary and generate "empty" speech.

15. Why is the hemodynamic response to a neural activity delayed?

ANSWER: The hemodynamic response to a neural activity is delayed because it takes time for the oxygenated blood to arrive at the corresponding location in the brain. The hemodynamic response reaches a peak about 4 to 5 s after the event. Thus, the point of maximum activity reflects events that were happening about 4 to 5 s previously.

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Chapter 01: Short Answer

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Chapter 01: Essay

1. Why should scientists in other fields study cognitive psychology?

ANSWER: Reasons given in the textbook:

- The basic mechanisms of human thought are important in understanding the types of behavior studied by other social sciences.
- Cognitive psychology is analogous to physics, in the sense that it is foundational to the other social sciences (in the same way that physics is foundational to the physical sciences).

Examples given in the textbook—Cognitive psychology is important in understanding:

- Psychopathology and its treatment (clinical psychology)
- How people behave with other individuals or in groups (social psychology)
- How persuasion works (political science)
- How people make economic decisions (economics)
- How groups can be organized (sociology)
- The features of language (linguistics)

2. What are the practical applications of cognitive psychology? Give specific examples.

ANSWER: One general point from the textbook:

- We could greatly improve humans' intellectual training and performance by better understanding intelligence and the acquisition of intellectual skills.

Other specific examples given in the textbook:

- Research regarding eyewitness testimony reliability, which led to the formation of guidelines for law enforcement personnel
- The design of computer-based devices, such as modern flight management systems on modern aircraft
- Advances in reading instruction and computerized mathematics instruction (education)

Given these examples, many more practical examples are possible in the future.

3. Why was cognitive psychology ignored as a subject of scientific inquiry for so many years?

ANSWER:

- People did not believe that the human mind could be subjected to scientific analysis.
- In the time of the ancient Greeks, philosophical debates would sometimes touch upon aspects of human cognition, but during this time other sciences developed, while cognitive psychology did not.
- It was not until the end of the 19th century that the scientific method was utilized to study human cognition.
- There were no technological or conceptual barriers to studying the mind scientifically prior to the end of the 19th century, but people were confused regarding how the human mind could possibly study itself.

4. Why did introspection fall out of favor among psychologists?

ANSWER:

- The German version (of introspection) was an intense process that involved having highly trained observers report the contents of their own consciousness under tightly controlled conditions, which led to controversy regarding whether or not conscious thought could be studied, since observers sometimes had a difficult time articulating their conscious experiences.
- The American version (of introspection) was implemented in a relatively more casual and reflective manner—not an intense analytic process—so different laboratories would report different results of introspection. Results were highly reflective of the laboratory members' own theory, suggesting that the introspective process was somehow subjective or tainted.
- The American intellectual climate was also focused on the need for an "action oriented"

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Chapter 01: Essay

psychology that would have practical applications, particularly for education. It did not lend itself well to American receptivity toward intense studies of consciousness.

5. What influences account for the modern development of cognitive psychology?

ANSWER: Cognitive psychology developed primarily between 1950 and 1970, and the main influences identified in the textbook as contributing to its development are:

- Research on human performance, which was a result of World War II
- Governments' practical wartime issues—such as helping soldiers use complicated equipment and training them to attend and perform under stress
- Broadbent and other psychologists of his time integrating research on human performance with new ideas from an area of study called information theory, which led to new developments in understanding perception and attention but also led to other analyses pervading all aspects of cognitive psychology

6. What is a replicability crisis, and why does it happen?

ANSWER: - Psychology has developed statistical standards for determining if apparent effects in average data from an experiment are likely to be found reliable if the experiment were repeated. It is common to estimate what is called a p-value, the probability that the result would be obtained by chance: a typical threshold for believing an effect is that it has a p-value of less than .05, meaning that there is a 95% chance that the effect is real.

- A replicability crisis means that experimental results reported with p-values below .05 are not replicated when the experiments are repeated.
- Reasons given in the textbook: It is often impossible to reproduce the exact conditions of the original experiment and the same population of participants. There is also a bias in which papers get published; experiments that fail to find effects considered not so important are not published.

7. How does Sternberg's theory exemplify a classical abstract information-processing account?

ANSWER: According to the textbook, there are four main ways in which Sternberg's theory exemplifies the information-processing approach:

1. Information processing is discussed without reference to the brain and its structures.
2. The processing of the information has a highly symbolic character.
3. The processing of information can be compared with the way in which computers process information.
4. The information processing is conceived as occurring in discrete stages (represented by a flowchart), with certain stages taking a certain amount of time.

8. What are split-brain patients, and what have we learned from research on them?

ANSWER: Split-brain patients have undergone surgery to sever their corpus callosum (the part of the brain connecting the right and left hemispheres). This surgery is sometimes done to prevent severe epileptic seizures, for example. Research on split-brain patients has taught us a lot about the functional differences between the right and left hemispheres:

- If a word was flashed on the left side of a screen that a split-brain patient was viewing, it would be received by the right, nonlanguage hemisphere. The patient would be able to pick up an object that the word described but would not be able to say the word.
- The right hemisphere can only process simple linguistic commands, while the left hemisphere demonstrates full linguistic comprehension.

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- The right hemisphere can much more adeptly perform basic manual tasks (with the left hand) compared with the left hemisphere (with the right hand).

9. Describe the methods used in cognitive neuroscience. In other words, how does one explore the neural basis of cognition?

ANSWER: Historically:

- Animal studies involving surgical removal of part of an animal's brain to observe the resulting functional deficits or measurement of neural activity in particular regions (limited generalizability to humans)
- Patient populations (e.g., patients with localized brain damage, split-brain patients, etc.)

More recently, new methods have developed in the study of cognitive neuroscience, primarily involving noninvasive brain-imaging techniques:

- Electroencephalography (EEG—recording electrical potentials on the scalp)
- Magnetoencephalography (MEG—recording magnetic fields produced by the brain's electrical activity)
- Positron emission tomography (PET—measuring metabolic rate or blood flow in brain regions)
- Functional magnetic resonance imaging (fMRI—also measuring metabolic rate or blood flow in brain regions)
- Transcranial magnetic stimulation (TMS—briefly incapacitating a region of the brain to study its function)

10. Select and describe two brain-imaging techniques. What are the benefits of each? What are the limitations of each?

ANSWER: The brain-imaging techniques described in the text include:

- Electroencephalography (EEG—recording electrical potentials on the scalp)
- Magnetoencephalography (MEG—recording magnetic fields produced by the brain's electrical activity)
- Positron emission tomography (PET—measuring metabolic rate or blood flow in brain regions)
- Functional magnetic resonance imaging (fMRI—also measuring metabolic rate or blood flow in brain regions)
- Transcranial magnetic stimulation (TMS—briefly incapacitating a region of the brain to study its function).

Each technique also has benefits and limitations:

- EEG yields good temporal resolution with event-related potentials, but it is difficult to determine the location(s) of the brain structures involved in scalp activity.
- MEG provides better spatial resolution than EEG and is good at detecting activity in the sulci (creases) of the cortex, but it is less sensitive to activity in the gyri (bumps) or deep-brain activity.
- PET and fMRI both provide good information about the location of neural activity but poor information about the timing of that activity.
- fMRI offers better spatial resolution than PET and is less intrusive.
- TMS is relatively safe and has no lasting effect, and it can help determine causal relationships between brain structures and functions.