

Exercise walk-through

1.1

Biological psychology: evidence and transfer

GRE · GRE Subject Test · GRE Psychology

Concepts 2

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Neurons communicate through electrical signals and synapses. A brain region's involvement does not establish that it acts alone.

Lesion and imaging studies give different evidence. Consider confounds and the limits of inferring causes from associations.

Reason through the worked case

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In a fictional alarm task, a bonus for reporting alarms raises hits from 60/100 to 80/100 and false alarms from 10/100 to 30/100. Does this establish improved sensitivity?

Hit rate rises from 60% to 80%, but false-alarm rate also rises from 10% to 30%. A more liberal response criterion can produce both changes. Hit rate alone cannot establish improved sensitivity; compare separation of signal and noise using both rates and a suitable model. Neither the bonus nor these illustrative counts identifies a neural cause.

Check the transfer argument

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Reduced sleep could affect memory processing, or stress/effort could affect both recall and activity. Compare ethically approved sleep conditions with standardized tasks and measured confounders; randomize condition order where suitable. Even then, a regional association does not establish that the region alone stores memories.

Accept a different explanation when its evidence and limits are justified.

Exercises 2.1·2.3

2.1 Reporting a sound when no sound was presented is a: [1]

A. hit B. false alarm C. correct rejection

2.2 A neuron sends an electrical signal along its: [1]

A. axon B. questionnaire C. retina only

2.3 Revisit the worked case. State one conclusion its evidence supports and one stronger conclusion it does not support. Explain the difference. [2]

Exercises 2.1·2.3

2.1 Reporting a sound when no sound was presented is a: [1]

A. hit B. false alarm C. correct rejection

2.1 Answer: B. It is a positive response on a noise-only trial. The other options do not satisfy the stated defining conditions.

2.2 A neuron sends an electrical signal along its: [1]

A. axon B. questionnaire C. retina only

2.2 Answer: A. Axons conduct action potentials toward terminals. Compare the exact process, design or evidence, rather than an associated keyword.

2.3 Revisit the worked case. State one conclusion its evidence supports and one stronger conclusion it does not support. Explain the difference. [2]

2.3 Use the worked case evidence to support a bounded claim and explain why a causal, universal or stronger claim needs additional evidence. The claim must fit the specific design and observed process.

Exercise 3.1

3.1 A participant sleeps little before a memory scan. Recall falls and one region is less active. Give two competing explanations and a design improvement. Give the interpretation, supporting reasoning, a relevant alternative or limitation, and an appropriate check.

[4]

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3.1 A participant sleeps little before a memory scan. Recall falls and one region is less active. Give two competing explanations and a design improvement. Give the interpretation, supporting reasoning, a relevant alternative or limitation, and an appropriate check. [4]

3.1 Reduced sleep could affect memory processing, or stress/effort could affect both recall and activity. Compare ethically approved sleep conditions with standardized tasks and measured confounders; randomize condition order where suitable. Even then, a regional association does not establish that the region alone stores memories. Award B1 each (authored) for the interpretation, its reasoning, a relevant limitation/alternative and an appropriate check, up to four points. Accept a different justified answer satisfying these demands.