

Biological psychology

Supported GRE teaching and original transfer practice

Identify the evidence

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Distinguish sensation, perception and psychophysics

Read SP.1, NE.1 and HB.1 for the detailed biological mechanisms.

Concepts 1

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Sensation concerns reception of stimulation; perception concerns interpretation. They interact but are not interchangeable.

Signal detection separates sensitivity from the criterion for saying yes. Expectations can change the response criterion.

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.

Read the reviewed representation

Signal detection: four outcomes separate sensitivity from bias

	Signal present	Signal absent
Respond yes	Hit	False alarm
Respond no	Miss	Correct rejection

Original schematic for Sensation, perception and psychophysics. Illustrative relationships and numbers are not research results.

Attempt an unfamiliar case

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A participant sleeps little before a memory scan. Recall falls and one region is less active. Give two competing explanations and a design improvement.

Pause and write the explanation before continuing.

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.

Limit the conclusion

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A brain image showing activity during a task is not proof that the region alone causes the behaviour.

Original classroom cases are not official questions or personal clinical advice.

Check yourself

Independent retrieval

A brain lesion and a poor memory score occur together. What comparison would strengthen a claim about the affected system?

Write your reasoning before comparing it with the methods and limits taught in this lesson.