Exercise walk-through

19.1

Thinking, problem solving and intelligence: evidence and transfer

GRE · GRE Subject Test · GRE Psychology

Concepts and schemas

- Natural concepts have fuzzy edges and are built around a **prototype** , the most typical member. People confirm "a robin is a bird" faster than "a penguin is a bird".
- A **schema** is organised knowledge about a topic; a script is a **schema** for a sequence of events, such as ordering in a restaurant.
- Schemas speed up understanding, but they also bend memory toward what was expected.

Problem solving

- Functional fixedness: seeing an object only in its usual role. In Duncker's candle problem, people fail to use the box of tacks as a shelf.
- Mental set: using a method that worked before when a simpler one is available.
- Useful strategies: means–end analysis (reduce the gap to the goal step by step), working backward from the goal, and setting the problem aside, which sometimes leads to sudden insight.

Intelligence

- Spearman (1904) found that scores on different tests correlate, and proposed a general factor, g.
- Cattell separated fluid intelligence (solving new problems, which declines in later adulthood) from crystallised intelligence (knowledge and vocabulary, which stays or rises).
- Gardner proposed multiple intelligences; Sternberg proposed analytical, creative and practical abilities.
- IQ tests are scaled to a mean of 100 and a standard deviation of 15. A score describes performance on that test under its conditions, with known reliability and validity; it is not a fixed measure of a person's worth.

Exercises 2.1–2.2

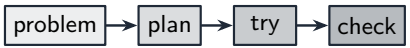
2.1 After heavy news coverage of plane crashes, a person judges air travel deadlier than driving. This best illustrates: [1]

A. anchoring B. the availability heuristic C. functional fixedness D. the serial position effect E. proactive interference



2.2 A quiet, bookish stranger is judged more likely to be a librarian than a farmer, although farmers vastly outnumber librarians. The error is: [1]

A. anchoring on the description B. representativeness neglecting base rates C. confirmation bias D. framing E. mental set



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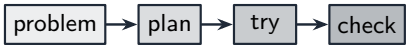
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2.1 Answer: B. Vivid, easily recalled examples inflate the judged frequency. The other options do not satisfy the stated defining conditions.

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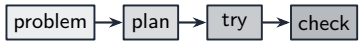
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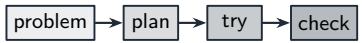
2.2 Answer: B. Similarity to the librarian prototype overrides the low base rate of librarians. Compare the exact process, design or evidence, rather than an associated keyword.

Exercises 2.3·3.1

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

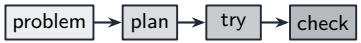


3.1 A method works on nine puzzles and fails on a tenth with different constraints. Explain how to decide whether the method is an algorithm or heuristic and propose a response. Give the interpretation, supporting reasoning, a relevant alternative or limitation, and an appropriate check. [4]



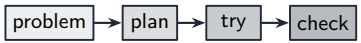
Exercises 2.3·3.1

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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.

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3.1 Check its stated domain and guarantee, not the number of past successes. A heuristic may be useful without guaranteeing a solution; an algorithm may fail if applied outside its domain or implemented incorrectly. Re-read the constraints, represent the new problem and test alternative operations rather than repeat the old method mechanically. 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.