

Gleitman: Ch. 9, pp. 341-348

1. What is a *mental representation*? Why are they important?
2. Using specific examples, both define and contrast *analogical representations*, such as *mental images*, and *symbolic representations*. Why do both kinds of mental representations seem to be important?
3. Summarize both behavioral and biological results suggesting that we process mental images in some of the same ways that we process actual pictures or scenes. Despite these results, what other results make it clear that visual images are not the same as pictures.
4. What is a *proposition*? Describe how propositions can be organized into networks. Your description should include and describe *nodes* and *associative links*.
5. What is *spreading activation*? Describe an experiment that provides evidence in support of spreading activation.

Zap #11: Mental Scanning

6. What happens in a mental scanning experiment? What are the typical results?
7. What is meant by saying that there is a *linear relation* between response time and actual scanning time in the mental scanning task?
8. What have researchers inferred about the relationship between visual perception and visual representations from experiments such as the mental scanning experiment?

Zap #12: Mental Rotation 2-D

9. What happens in a mental rotation experiment? What are the typical results?
10. What is the relation between the neural activations in a mental rotation experiment and when watching an actual object rotating?
11. What is a canonical viewpoint of an object? Why do canonical viewpoints matter for transformational agnostics?
12. Stephen Kosslyn has suggested that the function of mental rotation is to facilitate recognition of objects that we perceive in a rotated position. Discuss why such an ability might be important.

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13. Define *judgment*. How is similar to *reasoning*, *decision making*, and *problem solving*? How does judgment differ from the other three.
14. What role do *heuristics* have in our judgments – why are they both useful and dangerous?
15. How is the *distinctiveness* heuristic, which we discussed in relation to memory, similar to the heuristics described for thinking: e.g., the availability and representativeness heuristics?
16. Using examples, describe the *availability heuristic*. Given what we know about the operation of memory, why might this heuristic be misleading?
17. Using examples, describe the *representativeness heuristic*. Although useful, how and why is this heuristic often misused?

18. What characteristics distinguish situations in which the availability heuristic might be more applicable from those in which the representativeness heuristic might be more applicable?
19. Why would we expect the availability and representativeness heuristics to generally work well?
20. What can we do to guard against inappropriate uses of the availability and representativeness heuristics? Your answer should discuss *dual-process theory* and should characterize and distinguish *System 1* and *System 2* thinking.
21. What are some synonyms for System 1 and System 2 thinking?
22. What are situations or factors that increase the likelihood of System 1 thinking?
23. What are situations or factors that increase the likelihood of System 2 thinking?

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24. What is reasoning? Describe several examples. Be sure to include the specific example of a *syllogism*.
25. What is *confirmation bias*? Give several examples. Can you identify instances in which your thinking might be affected by a confirmation bias?
26. Describe several reasons why error rates for syllogisms are often found to be as high as 70%. Describe situations in which people generally do much better.
27. Does the distinction between System 1 and System 2 thinking apply to reasoning?

Zap #13: Wason Selection Task

28. Describe the type of reasoning statement known as a *conditional*.
29. What are the basic features of the *Wason selection* task?
30. What are two factors that improve performance in the Wason selection task?
31. Using examples, describe how performance on this task illustrates confirmation bias. What is a second error that people commonly make on this task?
32. Discuss how reasoning about *permission* might be an example of a *pragmatic reasoning schema*.

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33. How does decision-making differ from judgment and reasoning?
34. What are *framing effects*? Give an example? What simple pattern do they follow? Why do they provide a challenge to utility theory?
35. What is *affective forecasting*? Describe an example illustrating how it is often inaccurate.
36. Discuss the paradox that people usually say that they would like lots of choices, but often make worse decisions when they do. Why might this be related to loss aversion?
37. Discuss the distinction between how a choice is made and what choice is made. How might this distinction influence how pleased we are with a decision that we have made?
38. What does it mean to satisfice?

Zap #14: Decision making

39. What is *subjective utility*?

40. According to *Expected Utility Theory*, how do we combine *uncertainty (risk)* and subjective utility to evaluate options when making a decision? Why do the results from this Zap violate Expected Utility Theory?
41. What assumptions of Prospect Theory help it to explain the results from this Zap and phenomena such as *loss aversion*?

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42. What are meant by the terms *initial state* and *goal state* in problem solving?
43. Using examples describe and distinguish *well-defined* and *ill-defined* problems.
44. What is a *means-end* analysis? What are *subroutines* in this context?
45. What is *automaticity*? How does this concept help explain performance in the *Stroop* task? What role does it play in problem solving?
46. What is *mental set*? Using an example, explain why mental set may create an obstacle to efficient problem solving.
47. Describe how *restructuring* a problem may prove useful when we stuck trying to solve problems. In this context discuss the role of *analogies*.
48. What is *creativity* in the context of problem solving? Discuss the arguments for and against the role of *incubation* in creativity. How can spreading activation provide useful insight?
49. What is meant by *expertise* in problem solving? What contributes to expertise?
50. Describe and contrast four important types of directed thinking: judgment, reasoning, decision making, and problem solving.

Zap #15: Gestalt Problem Solving

51. What is an *insight* problem? How do insight problems differ from problems in which a means-end analysis (*reproductive* problem solving) is applicable?
52. What is *functional fixedness*?

Zap #16: Missionaries & Cannibals

53. Describe the Missionaries and Cannibals problem. Why is it better than, for example, a physics problem as a tool to understand problem-solving abilities?
54. What is a *hill-climbing* strategy for problem solving? Why does this strategy lead to an obstacle when solving this problem?
55. Compare four strategies for searching a problem space: means-end analysis, hill climbing, *breadth-first* search, and a *depth-first* search.