Chapter Eight: Cognition & Language

Learning Objectives

1. Define **cognitive psychology**. (See introductory section.)
2. Describe the core functions that form a **circle of thought**. (See "The Circle of Thought.")
3. Define **information-processing system** and **thinking**. Discuss the relationship between information-processing systems and decision making in humans. (See "The Circle of Thought.")
4. Define **mental chronometry** and **reaction time**. Describe how **complexity**, **expectancy**, **stimulus-response compatibility**, and **speed-accuracy tradeoff** influence reaction time. (See "Mental Chronometry.")
5. Define **evoked brain potential**. Discuss the use of evoked brain potential in the study of mental chronometry. (See "Evoked Brain Potentials.")
6. Describe **neuroimaging techniques** and how they are useful in studying information-processing. (See "Neuroimaging.")
7. Define **concept**. Describe the difference between **formal** and **natural concepts** and give an example of each. Explain the role of **prototypes** in natural concepts. (See "Concepts.")
8. Define **propositions**, **schemas**, **scripts**, and **mental models**, and describe their role in the thinking process. (See "Propositions"; see also "Schemas, Scripts, and Mental Models.")
9. Define **cognitive maps**, and discuss their use and the biases that distort them. Describe the manipulation of mental **images**. (See "Images and Cognitive Maps.")
10. Define **reasoning**, **formal reasoning**, **algorithms**, **rules of logic**, and **syllogisms**. Discuss the causes of errors in logical reasoning. (See "Thinking Strategies.")
11. Define **informal reasoning** and **heuristics**. Describe and give an example of the **anchoring**, **representativeness**, and **availability** heuristics. (See "Informal Reasoning.")
12. Describe the problem-solving strategies: incubation, **means-end analysis**, **working backward**, and **analogies**. (See "Strategies for Problem Solving.")
13. Explain why multiple hypotheses, **mental sets**, **functional fixedness**, ignoring negative evidence, and **confirmation bias** can hinder problem solving. Give an example of each. (See "Obstacles to Problem Solving.")
14. Explain why an expert is better at solving problems. Explain why experts use chunking more efficiently than novices do. Discuss the dangers of being an expert when solving problems. (See "Building Problem-Solving Skills.")
15. Define **artificial intelligence**, symbolic reasoning, and neural networks. Describe how expert systems can be used. (See "Problem Solving by Computer.")
16. Give an example of **multi-attribute decision making**. Define **utility** and **expected value**, and explain their role in the decision-making process. (See "Evaluating Options.")
17. Describe the sources of bias and flaws in decision making in regard to perceptions of utilities, losses, and probabilities. Be sure to include **loss aversion** and **gambler's fallacy**. (See "Biases and Flaws in Decision Making.")
18. Describe the impact of groups on decision making. Outline the typical discussion patterns in groups trying to make a decision. Define group polarization, and list the factors that improve or impair group decision making. (See "Linkages: Group Processes in Problem Solving and Decision Making.")
19. List the components of language. Define **language** and **grammar**. (See "The Elements of Language.")
20. Define **phoneme**, **morpheme**, and **words**. Give an example of the phonemes and morphemes in a word. (See "From Sounds to Sentences.")
21. Define syntax and semantics. Explain how syntax and semantics help us comprehend language. (See “From Sounds to Sentences.”)

22. Define surface structure and deep structure. Describe the surface and deep structures of a particular sentence. (See “Surface Structure and Deep Structure.”)

23. Discuss the role of bottom-up processing, top-down processing, and nonverbal cues in the comprehension of language. (See “Perceiving Words and Sentences.”)

24. Describe language development in children. Define babblings, the one-word stage, telegraphic speech, and complex sentences. (See “The Development of Language.”)

25. Discuss the roles of conditioning, imitation, nature, and nurture in language development. (See “How Is Language Acquired?”)

26. Describe the impact of a bilingual environment on the development of language abilities. (See “Bilingualism.”)

27. Discuss the controversy surrounding the question “Can nonhumans use language?” and describe what conclusions are reasonable, given the evidence so far. (See “Thinking Critically: Can Nonhumans Use Language?”)

28. Discuss the relationship among language, culture, and perception. Explain Whorf’s linguistic determinism and how Rosch’s study has led to a modified view of Whorf’s hypothesis. (See “Culture, Language, and Thought.”)

Chapter Eight Terms:

1. Cognitive Psychology
2. Thinking
3. Concept
4. Formal Concept
5. Natural Concept
6. Prototype
7. Proposition
8. Schemas
9. Script
10. Mental Model
11. Image
12. Cognitive Map
13. Reasoning
14. Formal Reasoning
15. Algorithm
16. Confirmation Bias
17. Informal Reasoning
18. Heuristic
19. Mental Set
20. Functional Fixedness
21. Utility
22. Expected Value
23. Language
24. Grammar
25. Phoneme
26. Morpheme
27. Word
28. Syntax
29. Semantics
30. Surface Structure
31. Deep Structure
32. Babblings
33. One-Word Stage