Study Questions I Cognitive Bases of Behavior September 24, 2008

1) What are the essential features and contributions of cognitive psychology, cognitive neuropsychology, and cognitive neuroscience to the overall domain of cognitive science?

2) What are the fundamental assumptions of the information-processing model to cognition? How do models of serial processing differ from models based on parallel distributed processing?

3) Describe Marr's "three levels of explanation" for cognitive theory and how they are important in theory building in cognitive science. Give a concrete example of each of the three levels as they relate to the problem of object recognition.

4) Marr (who liked to think in '3's) proposed three representations within the visual system that represented the extraction of different types of information from the visual array. Describe each of these representations (primal sketch, 2.5-D, 3-D) centering on the type of information each encodes and the likely psychological tasks each would allow us to perform.

5) Describe the major functional and anatomic distinctions between the dorsal and ventral visual streams in the brain. What are the implications for visual cognition?

6) Compare and contrast "template" vs. "feature" models of visual recognition.

7) Describe the essential features of Biederman's model of visual object processing. How is it different than the theory proposed by Marr & Nishihara? In what ways is it similar?

8) In what ways is the "top-down" vs. "bottom-up" distinction important for visual processing?

9) What is a "structural description" as it relates to vision? What is the difference between perceptual classification and semantic classification in vision? What kinds of tasks would a patient with a defect in each of these areas fail?)

10) What is the theoretical significance of category-specific recognition deficits in visual object processing? What evidence exists for specific neural substrates (faces, objects, body parts, scenes) of category-specific recognition? What evidence exists that category-specific recognition reflects learned expertise?

11) What is prosopagnosia? What evidence exists that faces are a special class of objects?

12) What are the major features of Broadbent's "filter theory" of attention? Cite one major piece of evidence for and against this theory.

13) How does Broadbent's model differ from models proposed by Treismann and by Deutsch & Deutsch? How does perceptual load theory offer a compromise?

14) Define the difference between "controlled" and "automatic" processes proposed by Atkinson & Shiffrin.

15) How do contemporary models of attention like those advanced by Posner differ from earlier theories (e.g., Broadbent)? What are the major attentional systems in the brain?

16) What is "negative priming"? Why is it important? What is the "attentional blink"? Why is it important? What is "repetition blindness"? Why is it important?

17) What are the essential features of Treisman's feature integration theory?

18) In dual task situations, what factors determine performance on the two tasks?

19) Define and understand the following basic terms in the memory literature: modal (mulistore) model of memory, short-term vs. long-term memory distinction, levels-of-processing theory, encoding-specificity principle, working memory, declarative-nondeclarative memory distinction, episodic-semantic memory distinction, proactive interference.