

Sample Short Answer Questions – Exam 3 Cognitive Psychology – PSYC325

Please find the sample exam questions for the third exam (available through web-CT from Saturday 12/9 at 12 am until Monday, 12/11 midnight) below. Just like in the first two exams, we will present you two randomly selected questions from this set and you will have to choose one to answer. The questions might not be identical to the ones below, but they will be very similar. Only one answer will be scored for the short answer portion. Please make sure that your answer is concise and addresses all of the parts of the question directly. Please also make sure that you SAVE! Your answer before submitting anything, and that you work on a stable computer with a stable internet connection...

1. Decision Making

- (a) Please explain the concept of “bounded rationality” in human decision making and why it was introduced into decision making theory. What was the alternative view before it was introduced?
- (b) Give two sufficiently different examples of decision making situations that nicely exemplify the gist of bounded rationality and explain why the decision makers are not fully rational.
- (c) Finally, please explain the two terms “heuristic” and “fallacy” and give an example for each one.

2. Schemata

In class we talked about schemata as a general memory concept. In your own words, please answer the following questions surrounding schemata (or schemas – use whatever term you like

- (a) Please define the meaning of the theoretical term Schema in your own words.
- (b) Give an example of a schema (or a script) and point out the important characteristics of a schema using your example (this part should be quite extensive)
- (c) Applying one of the models of the organization of semantic memory (your choice of one of the following: semantic networks, production systems, connectionist systems) explain how a schema might be implemented in the mind and how the functions you ascribed to a schema under (b) can be made possible within that framework.

3. Production Systems and Intelligent Tutorial Systems

In class I presented you with an interesting application of Production Systems. Using a production system architecture, such as ACT-R, researchers have tried to optimize computer-based instruction. This question focuses on some of the important parts of this approach.

- (a) First, please describe the general structure of a production systems. What parts do production system architecture usually have and how do they interact? What is meant by a conflict resolution strategy in this context?
- (b) Second, explain how a production system can be used to improve computer-based instruction. What are the main concepts that researchers have tried to implement to optimize this interaction? (c) Lastly, use Van Lehn's approach to the acquisition of simple arithmetic to illustrate the potential use of production systems in education. What is the main idea behind his system? Give a good example of how a production system could potentially assist

teachers in the context of the learning of basic mathematical operations such as addition and subtraction.

4. Long-term Memory

This question deals with issues surrounding long-term memory.

- (a) Describe in the context of the Atkinson & Shiffrin model, how information is stored and accessed in/from long-term memory.
- (b) What are some ways in which researchers have established that short-term memory and long-term memory work differently? What are the main differences? Give at least two examples of experiments that have been done to distinguish the two.
- (c) For thousands of years now, humans have used mnemonic techniques to memorize content for later reproduction (e.g., reciting poems, studying for an exam, etc.) Please name at least 3 different techniques that enhance memory for lists of items that need to be remembered (either in the order they were presented in or not - just make clear which technique is used for what purpose)
- (d) In which way can learning of class material be improved (assuming that it is not just a list of words)? Please list at least two empirical studies that have shown long-term memory advantages of particular "strategies" (or manipulations) for the memory of content material and explain why they work. How can students maximize the amount of information retained in long-term memory?

5. Analogical Problem Solving

- (a) Please explain the concept of "analogical problem solving" using the theoretical terms that you have learned in class. How does analogical problem solving work? Make sure that you go into some detail on this question.
- (b) Second, use Duncker's radiation problem as an example for analogical problem solving and identify some of the potential issues faced by a problem solver. You can, of course, add other examples to make your points as well. Please make sure that you list at least two different issues and that you point out the theoretical relevance of each.

6. Semantic Networks

The concept of a "semantic network model" of human long-term memory has been used in cognitive psychology for a long time. In this question you will have to describe the basic elements and assumptions of semantic network models and how information is being processed in them.

- (a) Please list the essential components of any semantic network theory. How is information represented within such a network?
- (b) Describe a commonly proposed processing mechanism for semantic networks. How is information processed and how do related concepts interact through a semantic network?
- (c) Describe Collins & Quillian's strictly hierarchical model of semantic memory - what are the specific assumptions of this type of model? In this context, explain the concept of inheritance. Give a simple example of how their model predicts human behavior (hint: sentence verification task). What is a problem that the model has run into because of the assumption of a strictly hierarchical organization (give example) and how has this assumption been relaxed.
- (d) Finally, describe briefly how priming can easily be explained within the semantic network model.

7. Linguistic Relativity

Please describe the basic idea behind the Sapir-Whorf hypothesis of linguistic relativity.

- (a) Describe the hypothesis in general – what does it claim in its strong version and what does it claim in its weaker version?
- (b) Please give two distinct (meaning VERY DIFFERENT) empirical examples that test the hypothesis and discuss the implications of this research.
- (c) If true, what practical implications might the theory of linguistic relativity have? Name a few (at least 2 distinct ones) that you can think of.

8. Language understanding

When reading a text or listening to a conversation, we must be able to take physical changes in the airpressure that arrives at our ears and transform this physical energy into meaningful discourse. This question asks you to trace the understanding of spoken language from the initial stages of processing to the level of discourse comprehension...

- (a) First, describe the difference of phones and phonemes in language comprehension. What role do phonemes play in language?
- (b) Second, give some examples for the analysis of words at the morphological level - what are some rules (at least 3) that are used to form valid words in the English language.
- (c) Third, explain the idea of top-down processing in the context of auditory sentence comprehension, assuming that there are at least two levels at which top-down processing occurs. Explain top-down processing at both those levels.
- (d) Lastly, think about discourse comprehension (for example, when someone is telling you a story.) Describe how a listener keeps track of the story and what high level mental representations might be involved. What information do you think does a listener have most accessible from that story? Is it a function of how recently something was said, or more a function of how different parts relate to each other in the story (both temporally or spatially)? Please illustrate your answer with an example.