Student ID#: _____*Answer Key*_____

Psychology 5054: The Psychology of Language
Spring, 2006
Final Exam

Part 1: Multiple Choice. Circle the letter corresponding to the correct answer. Only one answer is correct for each question. (1 point each)

1. Both McClelland and Elman's (1986) TRACE model of speech perception and PANDEMONIUM, include _____.
(a) sequential processing within each level of representation
(b) local representations of letters and features
(c) inhibitory connections between inconsistent alternatives

2. *If* Rumelhart & McClelland (1982) had *not* found that letters are recognized more quickly when they are presented in _____ than when they are presented in _____, the Interactive Activation Model would have been disconfirmed.
(a) isolation/pronounceable non-words
(b) pronounceable non-words/unpronounceable non-words that do share letter combinations with many real words
(c) unpronounceable non-words that do share letter combinations with many real words/ unpronounceable non-words that don't share letter combinations with many real words

3. _____ model of semantic memory uses distributed representations of concepts.
(a) Collins & Quillian's (1969) feature based
(b) Collins & Loftus' (1975) semantic network
(c) Farah & McClelland's (1991) parallel distributed processing

4. *If* McCloskey and Glucksberg (1979) had found that the presence of highly related negative sentences (e.g., "A bat is a bird.") *does* attenuate the _____ effect, then Smith, Shoben, and Rips (1974) model of semantic memory would have been confirmed.
(a) category size
(b) word superiority
(c) semantic distance (or typicality)

5. Processing in Fromkin's (1971) Utterance Generator Model of speech production (1971) is _____.
(a) bottom-up
(b) top-down
(c) interactive

6. The “lexical bias effect” in speech error research refers to our tendency to _____.
(a) hear words that were not in the speech stream
(b) make exchange/reversal errors that create real words
(c) leave out whole words during speech production

7. Irene Pepperberg taught a grey parrot named Alex to make “meaningful use of English speech” by using a training procedure that includes the trainer, Alex, and a third person who _____.
(a) models the appropriate use of speech for Alex
(b) acts as a rival for the trainer’s attention
(c) both of the above

8. In order to make sentences easier to read, LiveInk presents them one at a time on a computer screen and _____.
(a) places line breaks at constituent boundaries
(b) uses indentation to show the relationships between constituents
(c) both of the above

9. In *both* Farah & McClelland’s (1991) computational model of semantic memory and Waltz & Pollack’s (1985) massively parallel model of sentence understanding, processing is _____.
(a) sub-symbolic
(b) interactive
(c) both of the above

10. Kintsch’s (1988) construction-integration model of discourse processing and McClelland & Rumelhart’s (1981) interactive activation model of letter and word recognition *both* make use of _____.
(a) local representations
(b) sub-symbolic processes
(c) both of the above

Part 2: Definitions. In just 1 or 2 sentences, give an operational definition for each of the following concepts. Your definition may come from an experiment you are familiar with or you may make up your own definition (as long as it accurately defines the concept and is operational). (2 points each)

Grading Criteria:

- ***1 pt. for correctly identifying the concept***
- ***1 pt. for using a procedural definition***

11. Irregular (or Exception) Words

To find out if a particular word (e.g. "broad") is irregular, I would use a dictionary to find all the other words with the same ending and number of syllables (e.g., "toad," "road," and "load") as well as the correct pronunciation of each word. If the ending of the word is pronounced differently than in more than 50% or more of its neighbors, I would classify it as an irregular word.

12. The Dominant Meaning of an Ambiguous Word

To determine the dominant meaning of an ambiguous word such as "bank" I would ask 100 people to use it in a sentence, then I would count the number of sentences that (in my judgment) made use of each meaning listed in the latest edition of Webster's Dictionary (e.g., "financial institution" and "side of a river"). If one meaning was used in at least 65 of the sentences (65% of the total) I would take that to be the dominant meaning, otherwise there would be no dominant meaning for the word.

13. Psychological Distance Between Two Events in a Story

To measure the psychological distance between two events in a story I would present the story to a group of participants along with several other stories then ask them to make speeded true/false judgments by pushing a TRUE or FALSE button as quickly as possible in response to test sentences presented on a computer screen. I would measure the reaction time (in msec) for the second of the two events under two conditions, when it is preceded by a the first event and when it is preceded by an event from another story, and use the difference between these two times as my measure of the psychological distance between the two events.

14. The Difficulty of Understanding a Sentence

To measure the Difficulty of Understanding a Sentence, I would show it to a group of participants on a computer screen and ask them to indicate whether it is true or false by pressing a YES or NO button as quickly as possible. I would then calculate the reading rate for the sentence by dividing the average reading times (i.e., the time that elapses between the presentation of the sentence and a correct button press) by the number of words in the sentence.

15. The Codability of Colors

I would present squares of different colors to participants on a computer monitor and ask them to generate a name for each color as quickly as possible. The average naming latency (the time in msec that elapses between the presentation of a picture and the detection of a naming response by a voice key attached to a microphone) could be used to measure codability.

Part 3: Short Essay. Answer each of the following questions using no more than half of a page for each. (5 points each)

16. What is a double dissociation and why is it important? Give an example of a double dissociation from the psychology of language.

Grading Criteria:

- ***2 pts. for describing what a double dissociation is***
- ***1 pt. for describing why it is important***
- ***1 pt. for a correct example***
- ***1 pt. for overall coherence of the answer***

Example Answer:

A double dissociation involves two patients (A and B) and two tasks (I and II). It occurs when patient A performs normally on task I but shows an impairment on task II, while patient B performs normally on task II and shows an impairment on task I. This is important because it allows us to infer that tasks I and II involve independent cognitive functions. Moreover, if patients A and B exhibit damage in different parts of the brain the double dissociation offers evidence as to where those cognitive functions are localized. Phonological dyslexia and surface dyslexia represent a classical double dissociation. Patients with surface dyslexia are unable to read irregular words (such as "pint") but have no problem with pronounceable non-words (such as "lave"). Patients with phonological dyslexia show exactly the opposite pattern. This has led some researchers to conclude that phonological dyslexia involves the loss of the indirect route between print and lexical access while surface dyslexia involves the loss of the direct route.

17. Describe the difference between a top-down and a bottom-up process and give an example of each from theoretical models in the psychology of language.

Grading Criteria:

- ***1 pt. for describing a top-down process***
- ***1 pt. for describing a bottom-up process***
- ***1 pt. for a correct example of a top-down process***
- ***1 pt. for a correct example of a bottom-up process***
- ***1 pt. for overall coherence of the answer***

Example Answer:

This distinction presupposes the existence of a hierarchically embedded set of cognitive processes with the more perceptual or motor processes at the "bottom" of the hierarchy and the more conceptual or semantic processes at the "top". A bottom-up process is one that begins at the bottom of this hierarchy and proceeds upward. Forster's (1981) model of lexical access and sentence understanding offers a clear example. It assumes language understanding begins with an (unspecified) perceptual process that identifies the acoustic or visual features of an input sentence. This information is then passed to a higher-level lexical processor which identifies the sting of words that make up a sentence and passes them to a yet higher-level syntactic processor. The processes there figure out the grammatical structure of the sentence and pass that to an even higher-level semantic processor which determines the meaning of the sentence. A top-down process, on the other hand, is one that begins at the top of the hierarchy and proceeds downward. This is illustrated by Fromkin's (1971) Utterance Generator Model of speech production. This model assumes that a speaker must first determine the meaning they intend to convey, then map this message onto to a syntactic structure, then add intonation, then select words from the lexicon, then determine the string of phonemes to be conveyed, then finally generate and execute a sequence of motor commands.

18. Savin & Perchonock (1965) took advantage of the tradeoff between storage capacity and processing complexity in short-term memory in their experimental test of the derivational theory of complexity. How would you change their experiment to test the hypothesis that syntactic processing is facilitated by semantic constraint? Be sure to describe the independent and dependent variables in your modified experiment, using operational definitions and/or examples where they are appropriate. What pattern of results would you expect if the hypothesis is true? What pattern of results would you expect if the hypothesis is false?

Grading Criteria:

- ***1 pt. for identification of I.V.***
- ***1 pt. for identification of D.V.***
- ***1 pt. for correct prediction if hypothesis is true***
- ***1 pt. for correct prediction if hypothesis is false***
- ***1 pt. for overall coherence of the answer***

Example Answer:

I would present participants with a list of unrelated sentences. Each sentence would be followed by a list of eight randomly selected words unrelated to the sentence. Participants would be required to repeat back each sentence verbatim, then repeat back as many of the eight words as they could remember. All of the sentences would be passive sentences taken from Slobin (1966) except for some filler sentences that wouldnot be scored. The dependent variable would be the number of randomly selected words recalled correctly (0 - 8). The independent variable would be the reversibility of the sentences (as in Slobin, 1966). Half of the passive sentences would be reversible, meaning that the subject and object could potentially reverse roles (as in, "The girl was chased by the boy."). The other half would be irreversible, meaning that the subject and object could not change roles (as in, "The bagel was eaten by the boy."). If the hypothesis is true, I would expect more words to be recalled when the sentence is irreversible. If the hypothesis is false, I would expect to find no difference between the reversible and irreversible sentences.

19. Compare the representational and processing assumptions found in McClelland & Rumelhart's (1981) Interactive Activation Model to those in Waltz & Pollack's (1985) massively parallel model of sentence understanding. Be sure to point out at least one similarity and at least one difference between these two models.

Grading Criteria:

- ***1 pt. for comparing/contrasting representational assumptions***
- ***1 pt. comparing/contrasting representational assumptions***
- ***1 pt. for pointing out at least one similarity***
- ***1 pt. for pointing out at least one difference***
- ***1 pt. for overall coherence of the answer***

Example Answer:

Waltz & Pollack attempted to extend the architecture of the Interactive Activation Model (IAM) to the level of sentence comprehension. As a result the representational and processing assumptions are highly similar. Both use a network of nodes to represent knowledge. In both models, these nodes provide local representations of hypotheses about the information in the environment. The biggest difference between the models is in the nature of these hypotheses. In the IAM, each node represents a hypothesis about a word (e.g. "HUNT"), a letter at a particular position (e.g. "H" at the first letter position), or a visual feature at a particular position (e.g. a horizontal line in the middle of the field at the first letter position). Waltz & Pollack's model also includes nodes that represent words. To that, it adds nodes that represent concepts (e.g., the concept that the word "HUNT" refers to), grammatical constituents (e.g., "NOUN" or "VERB-PHRASE"), and contexts (e.g., the hunting context or the gambling context). The processing assumptions are virtually the same in both models. A massively parallel, interactive process of spreading activation and inhibition among the nodes is used to construct a consistent interpretation of the input.