Student ID#: ___*ANSWER KEY*___

Psychology 5054: The Psychology of Language
Spring, 2006
Midterm Exam #1

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. A patient who can't read one side of a word suffers from _____ dyslexia.
(a) attentional
(b) neglect
(c) surface

3. According to the _____ hypothesis thinking is information processing, information processing is computation on symbols, and the semantics of symbols connect thinking to the external world.
(a) symbol system
(b) sub-symbolic
(c) modularity

4. The smallest unit of sound that makes a difference in meaning is a _____.
(a) phoneme
(b) morpheme
(c) grapheme

5. Which of the following symptoms is normally associated with damage to the right cerebral cortex?
(a) pragmatic impairments
(b) diminished speech prosody
(c) both of the above

6. McClelland and Elman's (1986) TRACE model of speech perception is formulated at the level of analysis that Marr refers to as the _____.
(a) computational theory
(b) representation and algorithm
(c) hardware implementation

7. When participants in an experiment are shown a sentence like, “She spread the warm toast with lots of socks,” we would expect to observe _____.
(a) an increased P300 amplitude
(b) an increased N400 amplitude
(c) a decreased N600 amplitude

8. Different phones that are classified as one phoneme are called _____.
(a) phonemes
(b) minimal pairs
(c) allophones

9. *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

10. According to the _____ theory, speech sounds are recognized by translating auditory information into the articulatory programs that produced them.
(a) motor
(b) cohort
(c) TRACE

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. Naming Time

I would present participants with words on a computer screen and ask them to quickly and accurately pronounce each word as it appeared. Naming Time could then be defined as the time (in msec.) that elapsed between the presentation of a word and the detection of a response by a voice-activated relay.

12. Word Frequency

I would begin by collecting a very large sample of naturally occurring language such as all the magazines published in the U. S. during 2005. To determine the frequency of a given word, I would then calculate the number of times it occurs (per million words) in my sample.

13. Irregular 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 50% or more of its neighbors, I would classify it as an irregular word.

14. The Word Superiority Effect

To demonstrate the Word Superiority Effect, we could ask people to look at a fixation point on a computer screen then name, as quickly as possible, letters that appear in its place. The Word Superiority Effect can then be defined as the difference in letter naming times (the time that elapses between presenting a letter and detecting the naming response) between letters presented alone (e.g., "O") and letters presented in the context of a word (e.g., "DOG").

15. The Dominant Meaning of an Ambiguous Word

To determine the dominant meaning of an ambiguous word such as "bug" I would ask 50 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., "insect" and "listening device"). If one meaning was used in at least 30 of the sentences (60% of the total) I would take that to be the dominant meaning, otherwise there would be no dominant meaning for the word.

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. Compare the representational and processing assumptions found in McClelland & Rumelhart's (1981) Interactive Activation Model to those in McClelland and Elman's (1986) TRACE model of speech perception. 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. for comparing/contrasting processing 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:

In TRACE, *McClelland & Elman attempted to extend the architecture of the Interactive Activation Model (IAM) to the domain of speech perception. As a result the representational and processing assumptions are highly similar. Both use a three-layer network of nodes to represent knowledge. In both models, these nodes provide local representations of hypotheses about the information in the environment. 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). TRACE also includes nodes that represent words. But in place of letter-nodes it has nodes that represent phonemes at different points in time (e.g., /h/ at the beginning of the word). In place of visual-feature-nodes it has nodes that represent acoustic features at different points in time (e.g. voicing at the beginning of the word). 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.*