

## Problem Set 4

Due Monday March 12 in lecture

(1) Below are two confusion matrices which represent the probability that the stimulus in each row was categorized with the response in each column. One of these matrices represents simulated confusion data from an experiment where letters were presented visually, and one is from an experiment where letters were presented in the auditory modality. (a) Which confusion matrix corresponds to which experiment? (b) Explain your answer to (a). (c) If these letters were given to subjects in a Brown-Peterson paradigm, which matrix would better characterize the sorts of memory errors? (d) Why?

Matrix A

|   | C   | D   | K   | O   | Q   | V   | Z   |
|---|-----|-----|-----|-----|-----|-----|-----|
| C | --  | .75 | .09 | .18 | .13 | .75 | .85 |
| D | .77 | --  | .10 | .12 | .15 | .75 | .74 |
| K | .16 | .15 | --  | .08 | .19 | .15 | .08 |
| O | .15 | .16 | .11 | --  | .10 | .11 | .16 |
| Q | .17 | .15 | .20 | .10 | --  | .09 | .15 |
| V | .75 | .76 | .17 | .12 | .09 | --  | .79 |
| Z | .90 | .75 | .08 | .16 | .15 | .78 | --  |

Matrix B

|   | C   | D   | K   | O   | Q   | V   | Z   |
|---|-----|-----|-----|-----|-----|-----|-----|
| C | --  | .69 | .10 | .75 | .70 | .10 | .10 |
| D | .69 | --  | .12 | .65 | .50 | .09 | .11 |
| K | .10 | .12 | --  | .15 | .50 | .09 | .09 |
| O | .75 | .65 | .10 | --  | .70 | .10 | .10 |
| Q | .70 | .50 | .45 | .70 | --  | .06 | .11 |
| V | .10 | .08 | .12 | .09 | .12 | --  | .12 |
| Z | .10 | .13 | .08 | .08 | .10 | .11 | --  |

(2) How does the concept of short-term store in the “modal” or stage model of memory differ from the concept of working memory accepted by most of today’s cognitive psychologists?

(3) Homer’s epic poem *The Iliad* is 574 pages long, and yet Greek bards were reputed to be able to recite the entire poem verbatim. Given what we know about everyday memory, how do you think the Greek bards were able to recite *The Iliad* “verbatim”?

(4) You are a software interface designer working on the menu for a word processing program. You need to group the following functions under an appropriate heading. The heading you choose will become the menu title, with the functions appearing under the appropriate one. You can choose as many or as few menu headings as you wish.

save, save as, new, delete, open mail, send mail, quit,  
undo, table, glossary, preferences, character style, format

paragraph, lay out document, position on page, plain text, bold text, italic text, underline, open file, close file, open copy of file, increase point size, decrease point size, change font, add footnote, cut, copy, paste, clear, repaginate, add page break, insert graphic, insert index entry, print, print preview, page setup, view page, find word, change word, go to, go back, check spelling, view index, see table of contents, count words, renumber pages, repeat edit, show alternative document, help

- (a) What factor known to improve memory is relevant for the decision of what headings you will use?
- (b) You can group functions either into 3 menus, with lots of functions in each one, or into 8 menus with less in each. Explain which choice would be easier to use and why.
- (c) Make a chart with your headings at the top and functions underneath (i.e. that displays your menu design) and explain how the features of your design are compatible with factors that affect long term and working memory.

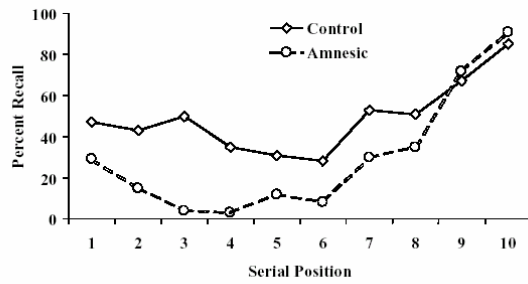
(5) Each row in the chart below represents the probability of recall as a function of three different sorts of orienting tasks. (a) What is an orienting task? (b) Give an example of each of the three orienting tasks that might have been used in this experiment.

Each column in the chart represents the probability of recall as a function of three different sorts of retrieval cues on a cued recall test. In the rhyme condition, they were given a rhyming word (e.g. “boat” for “vote”) and asked to recall a word from the previously studied list. In the category condition, they were told the category of the studied word (e.g. “fruit” for “apple”). In the sentence condition, they were given a previously encountered sentence and asked to recall the word associated with it. (c) What factor or factors does the levels of processing theory predict will affect the probability of recall? (d) In what way are these results consistent with the levels of processing theory? (e) In what way do these results diverge from the levels of processing theory?

| <u>Orienting Task</u> | <u>Retrieval Cue</u> |          |          |
|-----------------------|----------------------|----------|----------|
|                       | Rhyme                | Category | Sentence |
| Rhyme                 | .40                  | .15      | .10      |
| Category              | .43                  | .81      | .50      |
| Sentence              | .29                  | .46      | .78      |

(6) A group of anterograde amnesics and a group of healthy controls are tested on a serial recall task. The performance of each group is shown on the graph below.

## Serial Position Effect: Amnesia



- What effect is evident in the data of both the control subjects and the amnesics?
- What aspect of the modal model of memory do these data support?
- What aspect of the modal model of memory do these data argue against?