The Internal Lexicon. Part II

Lexical Access

The manner in which we store information is related to the ease of retrieval.

Models of Lexical Access:

- Search models
- Logogen model
- Cohort model

Search Models

Example: Forster's (1976,1979) autonomous search model:

- The lexicon is autonomous, i.e. independent of other systems involved in language processing. $\rightarrow$ activation of words is not directly influenced by syntactic or semantic factors. Information from the lexicon is fed into this more general system, and in this way syntactic/semantic information may influence word activation.
- the word recognition system has two components : the orthographic properties of the word; the phonetic properties of the word.
- The lexicon is organized in descending order of frequency, i.e. more frequent words are searched before lower frequent words.

Logogen Model

Example: Morton (1969)

- Each word (or morpheme) in the lexicon is represented as a logogen, which specifies the word's attributes (semantic, orthographic, phonological, and so on).
- The logogen is activated in either of two ways:
  - by sensory input
  - by contextual information
- A word is recognized as soon as it reaches threshold level.
- Different logogens have differen thresholds, depending on factors, such as frequency in language.

Cohort model

Example: Marslen-Wilson

- was designed specifically to account for auditory word recognition
- start of words activates all words that begin with that sound. This set of words is called a cohort. (bottom-up)
- Once initial cohort has been activated, further information (both bottom-up and top-down) serves to narrow the choices
- You recognize a word when you are left with a single choice. This is the point at which it diverges from other words - "the recognition point".

Problems with Cohort Model

- Most words don't diverge until after they end.
- Overemphasizes the importance of word onsets
- This may be problematic in fluent speech where word onsets are not known.

What influences lexical access?

- Word frequency
- Phonological variables
- syntactic category
- morphological complexity
- semantic relationships

Lexical Decision Task

- subjects see a string of letters and must rapidly decide whether the string is a word.
- one stimulus at a time; a list of words and non-words;
- frequent words are recognized faster
- frequency plays a role in normal reading as well (Rayner and Duffy 1986)

Phonology

- prosody
- interplay of bottom-up and top-down processes

Syntactic Category

The word frequency effect holds for open-class words.

There is no word-frequency effect for close-class words.

$\rightarrow$ We might have separate routes to retrieving words from different syntactic categories.

Morphology

- Claim : Morphological information and base word information are organized separately in the mental lexicon
- Pros:
  - storage economy
  - MacKay(1978), Taft & Forster(1981), Lima (1987): more complex morphological forms take greater time
- Cons:
  - Instead of accessing a single word, we would have to access both base and morpheme and then combine them.
  - (Rubin, Becker, Freeman 1979): the process of analyzing a word into its morphological components depends to some extent on the frequency of occurence of various types of words.

Semantic Priming

Semantic priming: a word presented earlier activates another, semantically related word. The task consists of two steps:

- A priming stimulus is presented
- A second (target) stimulus is presented

Lexical Ambiguity

- Do ambiguous words have more than one representation in the lexicon?
- Do we consider multiple meanings of ambiguous words when we hear or see one?
- How might the sentence context influence how lexically ambiguous words are processes?

Hogaboam and Perfetti (1975)

1. *The jealous husband read the letter*
2. *The antique typewriter was missing a letter*

- (1) requires the activation of the dominant postal meaning; (2) requires activation of the secondary sense.
- Participants were given a series of sentences such as these and were asked to decide whether the final word in the sentence was ambiguous

Hogaboam and Perfetti (1975), cont.

- Decision times were faster when the sentence required the secondary sense than when it required the primary meaning.
- Explanation: The common meaning is easily activated, so the time taken to find the other meaning is more directly related to response times in this task.

Evaluation of the Models

All of the models provide and explanation for the word frequency effect

- Logogen : each time a word is encountered, the threshold for that logogen is temporarily lowered. With high-frequency words, the recovery from the lowering of the threshold is less complete than with low-frequency words, so less sensory informatoin is needed for recognition.
- Search : Frequency effects are explained in terms of how words are stored in the various files.
- Cohort: Many word candidates are activated in the initial access phase, but more frequent words would be chosen in the subsequent stage.

Evaluation of the Models, cont.

All of the models can account for semantic priming

- Logogen : there is a rapid and temporary lowering of the threshold of those logogens that are related to a prime.
- Cohort : the prime narrows the set of candidates in the initial cohort list; a shorter initial cohort leads to faster recognition of a target word.
- Search: with each word, we generate a list of words that might come next. Priming is conceived of more as a controlled than an automatic process.

Cohort model is more explicit about the time course of spoken word recognition and thus is better able to explain how sounds in different positions within the word may affect recognition.