

Overview

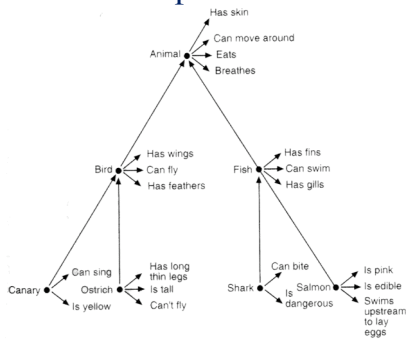
- How is our knowledge organized?
 - Different models of this
- How do you gain access to this knowledge?
 - Methodologies for examining this
 - Factors that influence this
- What about words that have multiple meanings?

Organization of knowledge

- Collins & Quillian
- Hierarchical model of knowledge
- Semantic network

See book, page 196-199

Example of model



Collins & Quillian (1979) *J. verbal learning & verbal behavior*

Network assumptions

- Storage space is limited
- It would thus be beneficial to store common information only once
 - principle of cognitive economy.

Testing the model

- Sentence verification task
 - Ss saw sentences & had to decide if they were true
- The canary is yellow
The canary has skin

Problems

- Faster to say a robin is a bird than to say an ostrich is a bird.
- Typicality effect
- Slower to say “A collie is a mammal” than “A collie is an animal”

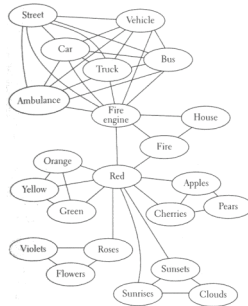
Alternative approach

- Semantic network that is not strictly hierarchical
 - Spreading activation model

See book, pages 200 - 202

Spreading activation model

- Collins & Loftus
- Works well for concepts
- Does not have connections to word forms

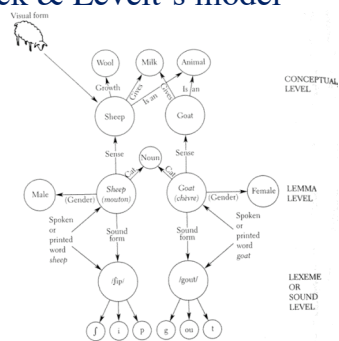


A spreading activation model of semantic knowledge.

Image from Collins & Loftus (1975), Psychological Review

Bock & Levelt's model

- Three levels:
 - Conceptual
 - Lemma
 - Word form



Bock & Levelt (1994)

Clinical implications of Levelt's model

- Lexical access failure can be of three types:
 - Failure to access correct concept
 - Failure to access correct lemma
 - Failure to access correct word form
- Some clinical theories recommend different therapy approaches for different error types
 - Poor conceptual access may be poor learning
 - Poor lemma retrieval - slowing speech to screen out competitors
 - Poor word form retrieval - phonological cueing, metalinguistic strategies such as syllable dividing

Lexical access

- Most models of lexical access start from perception
 - You hear a series of sounds and have to activate the correct word.
 - Ignore the issues of semantic information.

Methodologies

- Lexical decision.
- Identification in noise.
- Picture naming.
- Phoneme monitoring.

Variables that influence lexical access

- Word frequency
- Age of acquisition
- Syntactic category
- Lexical Neighborhood
- Morphological complexity

- Some of these appear to have different effects in clinical populations than in typically-developing children

See book, p. 167-170

Semantic priming

- Accessing an item speeds up subsequent access of related items.
- Meyer & Schvaneveldt study
- This suggests:

Lexical ambiguity

- Some words have more than one meaning.
 - bank; bug.
- Do these words have two separate representations in the lexicon?
- Do we consider both possible meanings of these words when we come across them?
- Or does the sentence context influence which one we access?

Lexical ambiguity, cont.

- We tend to be unaware of the presence of multiple meanings.
- “You need to rein in the horse.”
 - You or ewe?
 - Need or knead?
 - To, two or too?
 - Rein, rain, or reign?
 - In or inn?
 - Horse or hoarse?

Lexical ambiguity, cont.

- Even when the sentence would make sense with multiple interpretations we generally don't notice.
- “The sun is bright today”
 - Is the celestial body shining brightly, or is the male offspring intelligent today?

Lexical ambiguity, cont.

- We only become consciously aware of them when we misinterpret.
- Subjectively, it seems as if we access one interpretation, and then have to go back and reinterpret if that ends up being wrong.

Is that the case?

Research on lexical ambiguity

- Foss (1970) - phoneme monitoring technique.
- The phoneme appeared right after an ambiguous word.

The man started to drill before the truck arrived.

Research on lexical ambiguity, cont.

- Cairns & Kamerman
 - If the phoneme was delayed by as little as two syllables, the effect disappeared.
- This suggests that while multiple meanings of an ambiguous word are briefly entertained, the ambiguity is quickly resolved.

Can the semantics of a sentence override multiple activation?

Rumor had it that, for years, the government building has been plagued with problems. The man was not surprised when he found several spiders, roaches, and other bugs in the corner of his room.

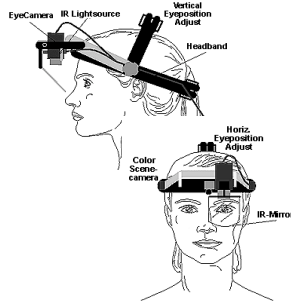
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- As listeners heard “bug”, they saw either a contextually-appropriate related word (ant), a contextually-inappropriate unrelated word (spy), or an unrelated word (sew).

Frequency biases

- For some words, both meanings are roughly equal in frequency.
- For others, one meaning is much more common – is dominant.
- Hogaboam & Perfetti
The jealous husband read the letter.
The antique typewriter was missing a letter.

Eye-tracking studies



One common type of eye-tracker sends an infrared beam of light into the eye and tracks the location of the reflections produced

Sources: www.mpi.nl/world/tg/eye-tracking/eye-tracking.html & www.lincoln.ac.uk/psychology/eyetrack.htm

Summary

- Dominant meaning is always activated.
- Secondary meaning is activated:
 - when necessary
 - When it is very similar in strength to dominant.
- When there is a strong frequency bias towards one word, and a strong sentential bias, the secondary meaning may not be activated at all.
