

Lecture 8

Speech perception and lexical access

Explanation?

Perception

The hearer: Speech Perception and lexical access

- Extracting phonetic elements and words from continuous, unsegmented, highly coarticulated signal poses difficulty in speech perception and lexical access.
- There are three features of the speech signal that the speech perception system must deal with: the signal is continuous, it transmits information in parallel, and it is highly variable. p. 170-171

Dinner table talk

Constructive speech perception

- The speech perception system takes information anywhere it can find it to construct a linguistic perception of the acoustic signal.

~~Video break!~~

- McGurk effect.
- If you watch a video of a person mouthing [ga ga ga] together with the audio track of a person saying [ba ba ba] you will hear [da da da].
- Visual overrides audio and vice versa.
- Lip reading.

Phoneme restoration

- Another break !

- Did you hear the cough before or after the word 'legislature'?

- Example 2: If we add silence between the /s/ and /l/ in SLICE (30-40 ms), English native speakers will perceive it as "SPlice".

- Phoneme restoration demonstrates the perceptual system's ability to 'fill in' missing information, while actively trying to recover meaning from an acoustic signal: what we hear is sometimes not what we perceive. p. 181

- The explanation for this phenomenon lies in the operation of the lexical retrieval system. It locates words using as much acoustic information as is available. p.181

Mondegreens

- Slips of the ear !
- She had on a French suit = She had on a trench suit. (This guy = the sky / I wish that I could be like the cookies-cool kids !! --- kenlee)
- An important difference between slips of the ear and phoneme restoration effect is that the former are often the result of inattentiveness to the signal, while the latter can be truly illusory. p. 128

Bottom-up and top-down information

An influential concept in psycholinguistics (and in psychology in general) is the distinction between bottom-up and top-down processing. Psycholinguistic processes are, at their core, information processing routines; we can ask to what extent these processes are triggered automatically based only on the acoustic signal (bottom-up) or are aided by contextual information, either in the communication situation or within the sentence being processed (top-down).

- Cat food (from a stranger vs. a friend).

The role of orthography. p.187

The **orthography** of a language is its writing system, including the characters (graphemes).

Reading involves matching each symbol with a phoneme.

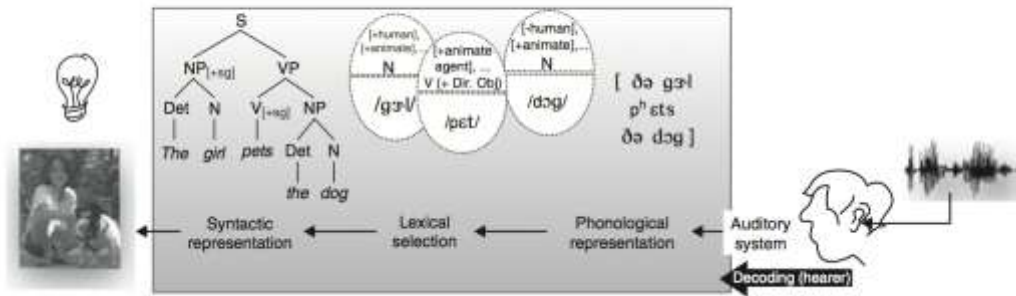
English/Hebrew bilinguals in a deletion task were asked to delete the first phoneme in monosyllabic words (gun/but). English speakers outperformed Hebrew speakers because of L1 orthography.

Lecture 9

Speech perception and lexical access

Accessing the lexicon

- The speaker accesses the lexicon using information about MEANING to retrieve the PHONOLOGICAL structure.
- The hearer's task is the opposite (Phonological representations- information about meaning)



- Lexical retrieval is remarkable (1 from 80000 items in a fraction of a second.)
- lexical access is affected by meaning and form relations among words, and by variables such as phonotactics, word frequency, and lexical ambiguity.
- Any evidence?

Lexical decision task

•Participants are briefly shown a string of letters and asked to push one button if the letters constitute a word in their language, and a different button if they do not - within 400-600 ms.

•Is it a word or not ? (activity)

•Clock

•Skern

•Bank

•Mother

•Doctor

•Nurse

•Tlat

•Plim

•Zner

•Table

•Urn

•Hut

•Floop

- Fable

- Mrock

- Bat

- In LDT, participants will see equal amounts of words and non-words.

- Quicker responses to Tlat, Zner, and Mrock.

- Slower responses to Skern, Plim, and Floop.

- All of them are non-words BUT the first three violate English phonotactics.
(impossible non-words)

- Also, faster responses are predicted to words like Clock and Bank than Hut or Urn.

- Why ?

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- Lexical retrieval and lexical frequency.

- The lexical frequency of a word can be measured by counting how many times a particular word occurs in a large corpus for that language.

Lexical ambiguity

- Ambiguous words = multiple lexical entries ?

- Some research has examined whether such words have more than one lexical entry, and whether having more than one lexical entry can lead to retrieval advantage

- Bank (money - river bank- snow bank)

- Homonyms & lexical retrieval

- Left (past tense of leave) & left (opposite of right)

- Polysemous words (the mouth of a river - the mouth of a person).

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- Research from LDT found that polysemous words (e.g. eye) are retrieved faster than homonymous words (e.g. punch)

- Homonyms = competing meanings = delayed retrieval.

Priming . p.190

- A stimulus you just experienced will affect how you respond to a later stimulus- and this associative response is true not just with linguistic stimuli, but with stimuli of any type (pictures, smells, non-linguistic sounds, etc).



Figure 6.6 Example of two prime–target pairs in a lexical decision experiment. The primes are in small letters, the targets in capital letters. The figure simulates the display sequence: the prime appears by itself and remains on the screen for a few hundred milliseconds; then the target appears. On the left, the prime and target are semantically related; on the right, they are unrelated. Notice that the primes, *nurse* and *cabin*, are matched in length (both are five characters long); primes are also usually matched by frequency and other variables.

- Responses to the target will be faster when it is preceded by a related than by an unrelated prime. (priming activates associates)
- Those errors give evidence that there is a level of lexical, syntactic, morphological and phonological processing before speech is produced.