□ Human Language Processing

Psycholinguistics—the study of how people comprehend, produce and acquire languages

² Speech chain p. 364

- The horse raced past the barn fell.
- *The baby seems sleeping.

3 Comprehension

- The speech signal
- articulatory
- Acoustic
- fundamental frequency → pitch
- Magnitude or intensity → loudness
- Formants → quality
- Spectrograms= voice prints (p. 366)
- formants

⁴ Speech perception and comprehension

- Segmentation problem
- Lack of Invariance problem
- Normalization
- Perceptual biases develop during the first year of life
- Lexical access or word recognition
- Stress and intonation provide clues to syntactic structure

5 Top-down and Bottom-up Processes

- Bottom-up processing—proceeds from the lowest level to the highest level
- Top-down processing—information at the highest levels may influence processing at the lower levels



7 DE Evidence for top-down processing

- Identify spoken words in the presence of noise
- Listeners make more errors when the words occur in isolation than in sentences
- They make more errors if the words occur in anomalous sentences.
- They make the most errors if the words occur in ungrammatical sentences.

8 ■ Role of context

Grade A

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- Grey Day
- Great Day

Lexical access and word recognition

- Lexical decision
- Response time or reaction time (RT)
- Frequency effect
- Priming e.g., doctor-nurse
- Naming

real words > nonwords

regular spelled words > irregularly spelt, low-frequency words

10 🔲 Electrical brain activity

- Show priming to pairs of verb forms such as teach / taught, which was not shown in lexical decision RTs.
- Listeners retrieve all meanings of a word even when the sentence containing the word biased toward one of the meanings.
- The ambiguous word primes words related to both of its meaning. (p. 371)

□ Syntactic processing

- The warehouse fires...
- 1....were set by an arsonist
- 2....employees over sixty
- After the child visited the doctor prescribed a course of injections.
- Garden path sentences

12 Minimal attachment principle

- Create simplest structure consistent with the grammar of the language
- The horse raced past the barn...
- After the child visited the doctor...

13 🔲 Late closure principle

- whenever possible, we prefer to attach new items to the current constituent
- (3) Tom said that Bill had taken the cleaning out yesterday.
- (4) Jessie put the book Kathy was reading in the library...
- (5) Since Jay always jogs a mile seems like a very short distance to him.

14 🔲 Experiments

- Eye tracking
- Shadowing task
- --subjects repeat what they hear as rapidly as possible.
- --Most of us shadow with a delay of 500-800 milliseconds.

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--Shadowers often correct speech errors

15 Speech Production

- Planning units: words, phrases, whole sentences
- Speech errors (p. 375-6)
- The intonation contour remained the same as in the intended utterances.
- Phonological errors involving segments or features primarily occur in content words.
- While words and lexical morphemes may be interchanged, grammatical morphemes may not be.

16 Lexical selection

- Blends (p. 377)
- Segments stay in the same position within the syllable as they were in the target words.

17 Application and misapplication of rules

- Regular rules are applied to combine morphemes and for possible but nonexistent words, e.g, groupment, ambigual
- Inflection rules: swimmed
- Morphophonemic rules: a burly [early] bird
- Allophonic rules: Big Ben → bin beg
- Phonemes are misordered before the nasalization applies.

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