Psycholinguistics: learning from ambiguity

0. A model of linguistic communication

We start with a simple -- perhaps simplistic -- picture of speech communication, which we've seen before.

- a person has an idea s/he wishes to communicate
- s/he puts it into words and utters them
- another person hears the sound, recognizes the words, and grasps the speaker's intent

We'll begin with the mind half in this lecture.

1. Psycholinguistics

What is psycholinguistics?
- The study of the acquisition, storage, production and comprehension of language.
- The study of the psychological processes that enable us to produce and comprehend language.

Linguists and psycholinguists have looked at many aspects of the production and perception of spoken language, too many to do more than list in a single lecture.

Some key topics
- **Sentence processing:** how we understand sentences. Why are some sentences harder to understand? How we deal with ambiguous sentences.
- **Spoken word recognition:** how we parse an acoustic stream into discrete units. How we recognize and access the meaning of words.
- **Language acquisition:** how do children acquire language
- **Speech production:** how we go from thoughts to sentences. Why do we make certain errors and not others?
- **Bilingualism:** how do we manage/organize the information for two languages. Do these systems interact or are they strictly separate?
- **Language and thought:** how does the language we speak affect the way we think?

We'll try look in a bit of detail at two kinds of studies -- those using speech errors to learn about language production, and those that look at ambiguity, particularly at the level of a sentence.
2. Ambiguity in language

• **Structural/lexical ambiguity:**
  Find at least 5 meanings of this sentence: \( I \text{ made her duck} \)

• **Phonetic ambiguity**
  Find at least 5 ways of breaking up this string of sounds into words: [\text{amef\textipa{d\textipa{k}}}]

• **Ambiguity is pervasive:** phonetics, segmentation, parts of speech, word meaning, syntax

2. How do we deal with ambiguity

• **Modularity vs. interactivity**
Modularity is

- **Serial vs. parallel processing**

  This means

  - We don’t wait till the end of the sentence to create an interpretation – *incremental interpretation*
  - We have processing biases: noun vs. verb, main verb vs. passive participle

- **What influences our initial interpretation?**
  - **Semantic plausibility** (Trueswell, Tanenhaus & Garnsey 1994)
    The defendant / evidence examined… *(ambiguous)*
    The defendant / evidence that was examined… *(non-ambiguous)*
    … by the lawyer turned out to be unreliable

  Reading times on the *by-phrase* slower in the *ambiguous* example ONLY for the animate subject: knowledge that “evidence” cannot examine things prevented being led down the garden path.

  - **Frequency** (MacDonald, 1994)
    The rancher knew that the nervous cattle pushed / moved …
    … into the crowded pen were afraid of the cowboys.

    Reading times slower with “pushed”: “push” is more frequent as a transitive verb
    “move” is more frequent as an intransitive verb

  When the verb is usually transitive, we are misled more easily

  - **Visual context** (Tanenhaus, Spivey-Knowlton, Eberhard & Sedivy, 1995)

  **Visual world paradigm:** People hear a sentence and look at a visual scene. What they look at (eyetracking device) will tell us how they interpreted the sentence.

  **PP-attachment ambiguities:** *Put the frog on the napkin… into the box*
  Destination of ‘putting’ event vs. Modifier of the NP ‘the frog’
  on the napkin “*put it on the napkin*” “the frog that is on the napkin”

  **Visual scene:**
  - one frog vs. two frogs
  Fixations to the napkin & to the frog No fixations to the napkin – immediate modifier interpretation
• Information from different sources is integrated rapidly into the process of interpretation

3. Conclusions

• Ambiguity can tell us about processing preferences, and factors that influence them
• Language processing is incremental, interactive and (at least in parts) parallel

Psycholinguistics is a vast field!..