Language: Syntax, semantics, and ambiguity

Syntax

- Two sentences:
  - Colorless green ideas sleep furiously
  - Sleep green furiously ideas colorless
- The first sentence:
  - Doesn’t make much sense, but
  - Is syntactically well-formed
  - Has nouns, verbs, adjectives, and adverbs grouped in a way that fits a rule we know

Phrase structure

- Which phrase structure?
  - He wants to discuss sex with Jay Leno.

  ![Phrase structure diagram]

Garden path sentences

- At the baby, the parser has a choice to make
  - Attach to While Anna bathed
    - Making the baby the object of bathed
  - Or, start a new clause
    - the baby spit up on the bed.

Garden path sentences

- The minimal attachment heuristic
  - The parser tries to keep it simple
  - Tries to add new words to the phrase structure it has constructed so far
  - Works most of the time (“heuristic”)
    - Most of the time, there’d be a comma after bathed
  - Here, parser runs into a dead end at spit

While Anna bathed the baby spit up on the bed.
Garden path sentences

(Christianson et al., 2001)

- Participants read sentences
  - Garden-path sentences
    - While Anna bathed the baby spit up on the bed.
  - Control sentences
    - While Anna bathed, the baby spit up on the bed.
  - Fillers

Garden path sentences

• Could Anna have been bathing the baby?
  – She was bathing herself
  – The baby was on the bed
  – So she would have had to be bathing herself on the bed
• ... probably not

Garden-path sentences

- Read each sentence at a normal pace
  – Were asked not to re-read
- Pressed a button when done
  – Sentence disappeared, then a 1/2-second later a question appeared
    • Did Anna bath the baby?
  – Participant answered yes or no
  – Then the next sentence appeared

Yes (incorrect) answers:

- Garden path: 57%
- Control: 12%

Interpretation:

- Temporary (local) ambiguities left behind a representation

Ambiguity

The cooling systems at all of the reactors were knocked out by the March 11 earthquake and tsunami, and power was first restored to units 5 and 6. They were offline before the quake

Ambiguity

- Incorrect representations can linger
  – Even if they’re only “temporary”
- Temporary ambiguities are very common
  – Possibly as often as every time you write a pronoun
- Hypothesis: The fewer the temporary ambiguities the clearer the writing will seem