

Chapter 9

Realistic Grammar

9.1 Lecture notes

Chapter 9

I. Psycholinguistic Evidence

- Chapter 9 discussed four types of psycholinguistic evidence and their implications for the design of grammar:
- Garden path sentences:
 - ? What is a garden path sentence? [**Slides:1–4**]
 - ? What design feature of the grammar does this motivate? (Grammar as constraint satisfaction — The contrast between the garden-path sentence in (1) and the non-garden-path sentence in (2) shows that linguistic and non-linguistic information is interleaved in sentence processing.)
 - (1) The horse raced past the barn fell.
 - (2) The evidence examined by the judge turned out to be unreliable.
- English echo questions:
- Example: [**Slides:5**]
 - (3) A: Señora Maria Consuelo Bustamente y Bacigalupo is coming to dinner tomorrow night.

B: Who did you say is coming to dinner tomorrow night?

? What design feature of the grammar does this motivate? (A grammar where a partial grammatical analysis is associated with a partial linguistic meaning. This, in turn, motivates surface-orientation.)

- Accessing of linguistic information and world knowledge
- Example: [Slides:6]

- (4) a. The sheep that was sleeping in the pen stood up.
b. The sheep in the pen had been sleeping and were about to wake up.

? What design feature of the grammar does this motivate? (Like the garden-path sentences, it shows that linguistic and non-linguistic information are interleaved in sentence processing. This example also shows the value of an order-independent constraint architecture. Sometimes, as in (4a), a given bit of linguistic information (the singularity of the verb *was*) comes into play earlier than relevant world knowledge (sleeping could happen in a fenced enclosure, but not in a writing implement). Yet in (4b) we see that the very same bits of information come into play in the opposite order in on-line processing. The order in which things kick in is guided not by the organization of grammar, but by the order in which relevant information, whether linguistic or nonlinguistic, is encountered. Our constraint-based view of grammar allows us to put all these different kinds of information on an equal footing, and hence provides a basis for incorporating our grammar into a model of how sentences like (4) are processed.)

- Syntactic ambiguity resolution:

? Why is there an increased parsing difficulty at the NP *the umbrella* in (5)? [Slides:7]

- (5) Lou forgot the umbrella was broken.

? Why is there not the same increase in parsing difficulty at *the umbrella* in the sentences in (6)? [Slides:8]

- (6) a. Lou hoped the umbrella was broken.
b. Lou put the umbrella in the closet.

c. Dana learned the umbrella was broken.

(In (6a) it's because *hoped* only subcategorizes for a sentential complement, in (6b) *put* only subcategorizes for NP PP, and in (6c), while *learn* can subcategorize for either an S or NP complement, *the umbrella* is not a plausible NP complement for *learn*.)

? What design feature of the grammar does this motivate? (Strong lexicalism — the concentration of grammatical information in the lexicon. In fact the list of kinds of information that MacDonald et al. (1994) found to be used in syntactic ambiguity resolution matches extremely well the features (and thus the kinds of information) recorded in lexical entries in our grammar.)

II. These Design Features in Historical Perspective

- Since the only grammar development you have seen is surface-oriented, constraint-based, and strongly lexicalist, it may seem obvious that a theory of grammar should have these properties.
- Historically, most work in the Chomskyan tradition has not had them.
 - Recommend Appendix B, which surveys some theories of grammar and their connections to each other and to the theory developed in the book.
 - Chomsky's work has always assumed that a component of syntactic theory was transformational – that is, involved operations changing one phrase structure into another.
 - The most plausible case, among phenomena we have examined, is imperatives: transformational accounts have assumed that something like a CFG generates an underlying (“deep”) structure such as *You close the door*, and a transformation deletes the second-person subject. This allows an account of the binding facts in which binding principles apply before the deletion.
 - Note that this is not surface-oriented (underlying structure needed as intermediate step in generating the sentence).
 - And it is inherently directional.

- Both of these properties make it hard to fit into a processing model that comports well with the psycholinguistic evidence.
 - The incremental character of processing (assigning partial interpretations to partial sentences) doesn't lend itself to modeling in terms of a transformational grammar.
 - The usual direction of transformational derivations doesn't allow them to fit in naturally to a comprehension model.
- Strong lexicalism is quite compatible with a transformational model, but most versions of transformational grammar haven't adhered to it.
- One claim that came out of the transformational tradition (though there is no necessary conceptual linkage) is that the mind – and particularly the language faculty – is highly modular (Jerry Fodor). That is, it consists of a number of highly specialized, “informationally encapsulated” mechanisms (“mental organs”). On this view, say, syntactic processing would precede semantic processing, which in turn would precede pragmatic processing. That is, a listener would first assign a syntactic structure to an utterance, then assign a literal meaning to it, and then assess the plausibility of the meaning. Each stage of this process would interact with only the output of the preceding one.
 - This modular picture has been severely undermined by work in psycholinguistics since the mid-1980s. That research shows that all kinds of knowledge (linguistic and non-linguistic) are accessed whenever it would be useful in the process of understanding an utterance.
 - The grammatical theory that we present is rejects the strong version of modularity: many kinds of information are brought together in feature structures and interact there.
- In short, the design features we tout are not only non-obvious, the majority of research within the Chomskyan tradition has rejected at least some of them

III. Universal Grammar

- There are two main, distinct questions in the study of Universal Grammar:

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1. What aspects of language are universal, i.e. common to all languages?
 2. What aspects of language are particular to language and not shared by other cognitive processes?
- That second question is in there because of the way the study of Universal Grammar was framed by Chomsky. To account for children’s ability to learn their native language, Chomsky argued that much linguistic structure must be innate, and not learned. In that case, humans would have a ‘mental organ’ for language which is distinct from other ‘mental organs’.
 - Section 9.6 discusses the various parts of the grammar and whether they are English-specific or plausibly common to all languages and whether they are language-specific or plausibly common to other cognitive functions.
- ? What’s an example of something English-specific in our grammar?
- ? What’s an example of a plausible language universal?
- ? What’s an example of something that’s probably language-specific in the grammar?
- ? What’s an example of something that is probably shared with other cognitive systems?

III. Nuts and Bolts

- The rest of Chapter 9 is a summary of the grammar so far.
- One inaccuracy in the grammar of Ch. 9 to discuss:
 - The Anaphoric Agreement Principle is incorporated as part of the definition of Phrasal Satisfaction. [**Slides:9–10**]
 - This means that it can only apply to local trees — and that it only accounts for agreement between reflexive pronouns and their antecedents (since these will be on the same ARG-ST and thus both part of some local tree).
 - However, it does not account for agreement between non-reflexive pronouns and their antecedents, as it was intended to do (cf. Ch. 7).

- The further puzzle is that agreement between pronouns and their antecedents holds across different sentences in a discourse, so no sentence-based well-formedness definition could really capture it.
- The solution to this puzzle lies in a formal theory of how discourses are built out of sentences.
- Use remaining time to answer questions about anything in the grammar so far.