INTD0112
Introduction to Linguistics

Lecture #12
April 3rd, 2007

Announcements

➢ Reminder: Paper proposal is due next week on Tuesday. Decide on a topic if you haven't already, and find a partner if you haven't already.

➢ Any topic relating to the study of human language should be in principle acceptable. Choose something that interests you.

Some possible topics for your paper

a. The critical period for first language acquisition.
b. Animal communication systems vs. human language.
c. The nature of meaning.
d. Language history/language change.
e. Second language acquisition.

Some possible topics for your paper

f. Indigenous languages of the world.
g. Endangered languages.
h. Sign languages/ASL
i. Sentence processing (Psycholinguistics)
j. Language and the brain (Neurolinguistics)
k. Slang/Formal vs. informal language.

Some possible topics for your paper

l. Social dialects.
m. Geographical dialects.
n. African American English.
o. Chicano English.
p. Dominant languages/Global languages/Lingua francas
q. Natural language processing (Computational Linguistics)

Some possible topics for your paper

s. Pidgins and creoles.
t. Language planning/Language policies
u. Writing systems
v. Language classification/Language families.
w. Language contact
x. Discourse analysis/conversation analysis
y. Bilingualism/multilingualism
z. Language and culture

Summary of the first half

- Human language is different in kind from other communication systems.
- Linguistic knowledge is subconscious. Native speakers do not need formal instruction to learn their language.
- For formal linguists, language is a mental system, a grammar, to use a traditional term.
- A grammar has subcomponents. So far, we discussed phonetics, phonology, morphology, and semantics. Today we start SYNTAX.

Syntax

- Syntax is the study of how words combine together to form larger units in human language.
- The larger units are typically called **phrases** and **sentences**, and the use of these combinatorial rules creates "**structure**".
- In short, then, syntax is *the study of structure in human language*.

Syntactic knowledge: Grammaticality

- There are several aspects of native speakers' syntactic knowledge of their language.
- For one thing, native speakers know what is grammatical and what is ungrammatical in their language, e.g.,

  The silly man hit the nice woman.

  *Silly hit man the nice the woman.

Syntactic knowledge: Grammaticality

- Remember too from Assignemnt#1 that **grammaticality does not depend on meaning**. A sentence can be grammatical even if it is meaningless, e.g.
  Colorless green ideas sleep furiously.
- Similarly, we can figure out the meaning of an ungrammatical sentence like the one below (or think of how you can understand a foreigner who hardly speaks English), e.g.
  The boy quickly in the house the ball found.
- These two facts seem to suggest that *syntax is an autonomous system*, that is, it has its own rules independent of meaning.

Syntactic knowledge: Ambiguity

- Our syntactic knowledge also enables us to understand cases of **ambiguity**. Remember these sentences?
  Anne hit the man with an umbrella.

  Visiting relatives can be a nuisance.

Syntactic knowledge: Sentence relatedness

- Our knowledge of the syntax of our language also enables us to know cases of **synonymy** or **near**-**synonymy** between sentences, as the case is with active and passive senesces:
  John broke the window.
  The window was broken by John.
- The same also applies to pairs of sentences like this one, where again two different structures have the same meaning:
  John gave a book to Mary.
  John gave Mary a book.

Syntactic knowledge: Sentence relatedness

➢ Another case of sentence relatedness is that between statements and questions:

They will be in London tomorrow.

Will they be in London tomorrow?

Syntactic knowledge: Recursiveness

➢ Recall also that our use of language is **creative**, that is, we are able to produce and understand an **infinite** number of sentences, even though our linguistic resources are finite.

➢ Remember also that a sentence in human language could in principle be **recursively infinite** as in the following example:

This is the dog that chased the cat that killed the rat that ate the cheese that was on the table that was in the room that …

Syntax

➢ For our theory of grammar to be adequate, it has to account for these different aspects of native speakers' subconscious syntactic knowledge. And this is what the study of syntax is about.

Constituency

➢ A sentence is a random sequence of words; rather, every sentence has a *syntactic structure*.

➢ And the key notion to understanding syntactic structure is that of *constituency*. Let's see what this means.

Constituency

➢ Consider the following sentence:

The linguist has drawn a tree.

➢ If I ask you to divide the sentence into two units, where would you draw the line?

➢ Right:

(1) The linguist | has drawn a tree.

Constituency

➢ Intuitively, we "know" that certain words "hang together" in the sentence to the exclusion of others. We call such strings of words "**constituents**".

➢ And we can actually determine constituency by means of "objective" diagnostic tests. Let's consider a couple of these tests.

Substitution test for constituency

> If a string of words can be replaced by one word and the result is a grammatical sentence while preserving the original meaning, then it must be that this string of words comprises a "constituent".

Substitution test for constituency

(2) a. [The linguist] has drawn a tree.
  ✓ *He* has drawn a tree..
  b. The [linguist has drawn a tree].
    *The ???
  c. [The linguist has] drawn a tree.
    *??? drawn a tree.
  d. [The linguist has drawn a] tree.
    *??? tree.

Substitution test for constituency

(3) a. [The tall boy] ate the burrito.
    ✓ *He* ate the burrito.
  b. The tall boy ate [the burrito].
    ✓ The linguist ate *it.*
  c. [The tall boy ate] the burrito.
    *??? the burrito.
  d. The tall boy [ate the burrito]
    ✓ The tall boy *did.*
  e. The tall boy ate the burrito [in the classroom]
    The tall boy ate the burrito *there*

Fronting test for constituency

> If a string of words can be fronted in a sentence, then this string of words comprises a "constituent":
(4) a. I first met him [at the party].
    At the party I first met him.
  b. I first met [him at the party].
    **Him at the party* I first met.

Fronting test for constituency

  c. I knew he would [eat the whole pizza], and *eat the whole pizza* he did.
  d. *I knew he [would eat the] whole pizza, and *would eat the* he did whole pizza.
  e. I read [this book by Chomsky] before.
    This book by Chomsky I read before.
  f. I read this book [by Chomsky before].
    **By Chomsky before* I read this book.

Phrase structure: Heads and complements

> Each constituent is a phrase that has a **head**, where "head" is defined as "the obligatory nucleus around which the phrase is built."
> A head may have a **complement**, e.g.,
    an object of a V: *rented a car*.
> The type of the phrase is determined by the category of its head.

Lexical categories

- Remember from our discussion of morphology that there are four major *lexical categories* in human language:

  Noun (N),
  Verb (V),
  Adjective (A), and
  Preposition (P).

- As we should expect, each one of these categories can be the head of a phrase.

Phrase structure: Heads and complements

- So,

  "picture of the boys" is a *noun phrase* (NP), since the head of the string is the N "picture".

  "ate the sandwich", by contrast, is a *verb phrase* (VP), since the head of the string is the V "ate".

  "in the office" is a *prepositional phrase* (PP), since the head of the string is the P "in".

  "fond of chocolate" is an adjectival phrase (AP), since the head of the string is the A "fond".

Phrase structure rules

- We express this head-complement relationship by means of rewriting rules, which we call *phrase structure rules*, as in the following examples:

  NP → N PP
  VP → V NP
  PP → P NP
  AP → A PP

Subcategorization

- Notice that heads differ as to whether they need complements and how many they take. Technically, we say they have different *subcategorization* properties.
- For example, transitive verbs require complements, but intransitive verbs do not:

  John slept.
  *John slept the dog.
  John bought a new car.
  *John bought.

Subcategorization

- Furthermore, transitive verbs differ in whether they subcategorize for an NP complement like "buy" above, or a PP complement as "talk" in:

  I talked [$_{PP}$ to his boss].

- Some transitive verbs even require two complements, such as "give" and "put":

  She gave [$_{NP}$ me] [$_{NP}$ money].
  Alice put [$_{NP}$ the car] [$_{PP}$ in the garage].

Phrase structure: Specifiers

- Notice finally that while complements may be obligatory (depending on the subcategorization properties of the head), a head may also have nonobligatory "satellite" elements, called *specifiers*, e.g.,

  an adverb (Adv) of a V: *sometimes rented a car*.
  a determiner (Det) of an N: *the linguist*
  a degree (Deg) word of an A or a P: *very nice/straight into the room*

X'-schema for phrase structure

➢ To generalize, using X as a variable ranging over all heads, every phrase has the internal structure below:

(5)
```
              XP
            /    \
     Specifier    X'
                /    \
               X    complement
```
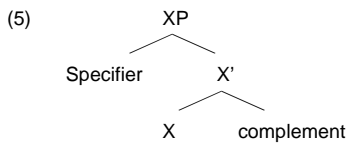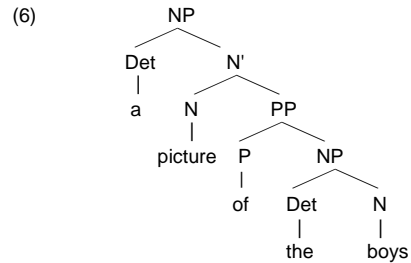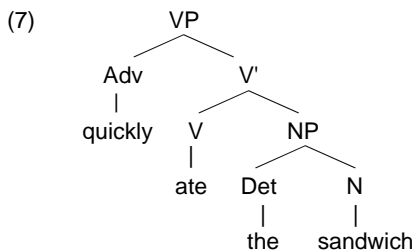
➢ We can then apply this X'-schema to all heads.

NP

(6)
```
              NP
            /    \
         Det      N'
          |      /   \
          a     N     PP
                |    /   \
            picture P     NP
                    |    /   \
                   of  Det    N
                        |     |
                       the   boys
```

VP

(7)
```
              VP
            /    \
         Adv      V'
          |      /   \
       quickly  V     NP
                |    /   \
               ate  Det    N
                     |     |
                    the  sandwich
```

PP

(8)
```
              PP
            /    \
         Adv      P'
          |      /   \
        right   P     NP
                |    /   \
              into  Det    N
                     |     |
                    the  office
```

AP

(9)
```
              AP
            /    \
         Deg      A'
          |      /   \
        very    A     PP
                |    /   \
              fond  P     NP
                    |     |
                   of     N
                          |
                      chocolate
```
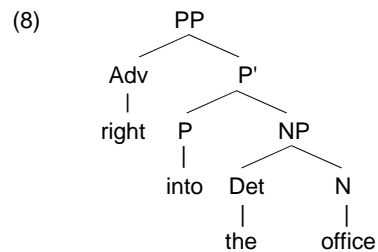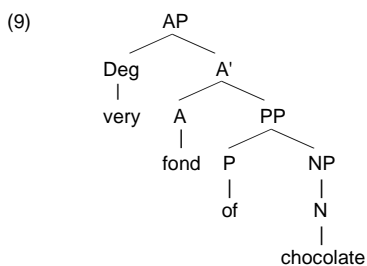
What's the head of a sentence?

➢ Consider now sentences such as
   John will eat the pizza.
➢ Since we know that "John" is a constituent, it must be that "will eat the pizza" is also a constituent. But what kind of constituent is it?
➢ Let's assume that the head here is the modal verb "will", whose complement is the VP "eat the pizza", and whose specifier is the subject "John", and that the whole string is an **Inflection Phrase** (IP), as shown in the following diagram:

IP

(10)
```
            IP
          /    \
        NP      I'
       John    /  \
             I     VP
            will   / \
                  V    NP
                 eat  the pizza
```
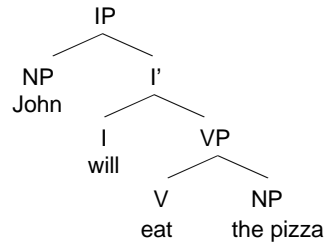
IP

- ➢ But now consider this sentence:
  (11) John ate the pizza.

- ➢ Since the subject "John" is still present, we have to assume that there is some "I" element in the sentence, since subjects are specifiers of I. But it does not look like there is a modal verb there.
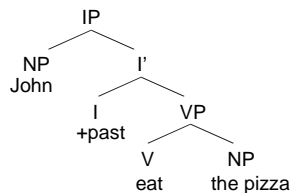- ➢ To solve this problem, linguists assume that the tense morpheme is actually a form of I.

IP

- ➢ The structure of "John ate the pizza" will look like that, then:

(12)
```
            IP
          /    \
        NP      I'
       John    /  \
             I     VP
           +past   / \
                  V    NP
                 eat  the pizza
```

- ➢ Question: How does "eat" and "past" become the word "ate"?

One more category

- ➢ Consider the *complement* (also called *embedded*) clause of the verb "says" in
  (13) John says [that he will eat the pizza].

- ➢ Now, the embedded clause looks identical to the IP from the previous slide, except that it has an extra element, that is, the **complementizer** *that*, which carries the so-called *illocutionary force* of the clause, e.g., whether the clause is declarative or interrogative.

CP

- ➢ Using the same X'-schema, this must be a head-complement relation (though no specifier is available here, but remember that specifiers are optional).

- ➢ Let's assume then that a complementizer (abbreviated C) also heads a phrase, and that its complement is IP, as shown on the next slide:

CP (embedded)

(14)
```
            CP
          /    \
        C       IP
       that    /   \
             NP      I'
             he     /  \
                  I     VP
                 will   / \
                       V    NP
                      eat  the pizza
```
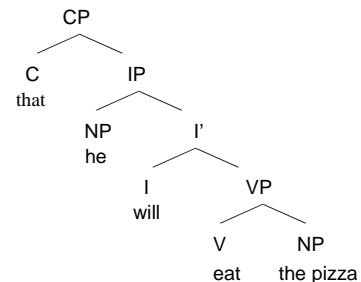
CP

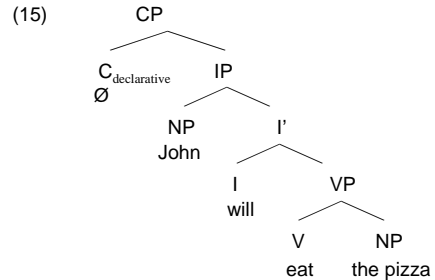- Notice, however, that if C determines the illocutionary force of a clause, then it must also be present in matrix (i.e., non-embedded) clauses, though not pronounced.

- In other words, the structure of "*John will eat the pizza*" is actually as on the next slide, with a null C heading the sentence and indicating that this is a declarative sentence:

CP (matrix)

(15)

```
              CP
           /      \
   C_declarative   IP
       Ø          /    \
                NP       I'
                John    /    \
                       I       VP
                      will    /    \
                             V      NP
                            eat   the pizza
```

A mini-grammar for English phrase structure

- So putting all of this together, here's a mini-grammar for English phrase structure, where bracketing indicates optionality:

(16)

```
CP → C IP
IP → NP I'
I' → I VP
VP → V (NP) (PP)
VP → V (CP)
NP → (Det) N (PP)
AP → (Deg) A (PP)
PP → P NP
```

A mini-grammar for English phrase structure

- In addition, we have to assume a set of rules that insert words under "terminal" nodes in the tree, e.g.,

  - N → {man, dog, justice, …}
  - V → {love, hit, leave, …}
  - I → {will, must, Past, Future, …}
  - etc.

- As you should expect, these are called *lexical insertion* rules.

- Time for some tree-drawing fun. Let's draw trees for some sentences.

Our children like this music.

(15a)

```
              CP
           /      \
   C_declarative   IP
       Ø          /       \
                NP          I'
              /    \       /    \
            Det     N     I      VP
            our  children -past  /    \
                               V      NP
                              like   /    \
                                   Det     N
                                   this   music
```

8

He is proud of his medals.

(15)

```
                CP
              /    \
  C_declarative    IP
   Ø              /  \
               NP      I'
               |      /  \
              Pro    I      VP
               |    -past  /  \
               he        V      AP
                         is    /  \
                            Adj     PP
                           proud   /  \
                                  P      NP
                                  of    /  \
                                     Det     N
                                     his   medals
```
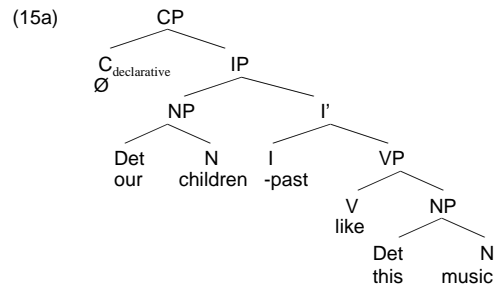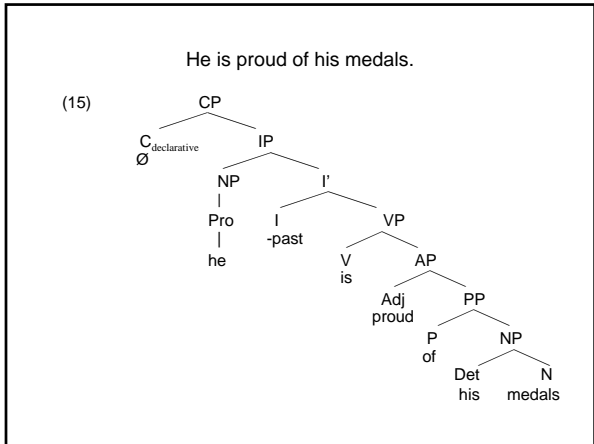
> So, how does the syntactic structure of the following sentence look like?
>
> *The linguist knows that this language has become extinct.*

```
                CP
              /    \
  C_declarative    IP
   Ø              /   \
               NP        I'
              /  \      /  \
           Det    N    I      VP
           the  linguist -past /  \
                             V      CP
                            know   /  \
                          C_declarative  IP
                            that        /  \
                                     NP      I'
                                    /  \    /  \
                                 Det    N   I     VP
                                 this language has /  \
                                              V      AP
                                            become  extinct
```
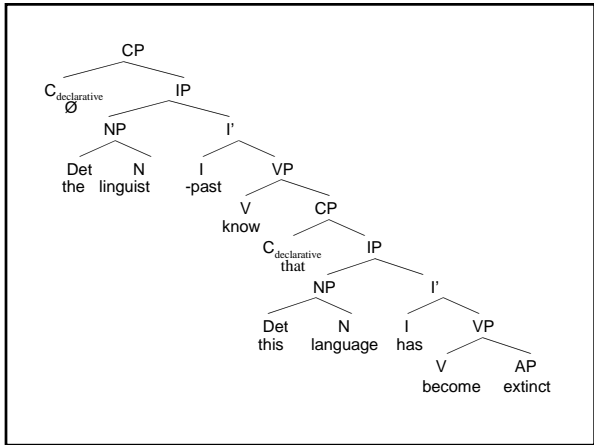
Next class agenda

> More syntax: Read the section on "Move" in the chapter.
> How and why do languages differ in their syntax?