

INTD0112 Introduction to Linguistics

Lecture #15
Oct 28th, 2009

Announcements

- Just a reminder: The second talk in the Language Works series is today at 4:30pm at RAJ. You can earn 5 points of extra credit for writing a one-page report on the talk and handing it in next Wed Nov 4th.
- Another reminder: Your one-page LAP proposal is due this coming Monday.
- If you have time this weekend, you might want to start watching Part II of the *Human Language Series* on language acquisition, since we start talking about this next week. There will also be questions on HW4 from this movie.

Puzzle of the day

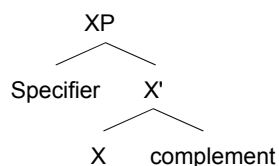
- So, why do syntacticians draw trees for sentences? Just for fun?
- Well, it turns out that syntactic trees resolve mysteries that would otherwise remain uncovered (that said, tree-drawing is also fun).
- Here is one such mystery:
Anne hit the man with an umbrella.
(How many meanings?)
- Let's ask a question:
What did Anne hit the man with?
(How many meanings?)

Summary of Syntax so far

- Syntax is the study of sentence structure.
- They key notion to understanding sentence structure in human language is "**constituency**."
- Constituency of a string of words can be determined by objective diagnostics: **substitution test**, **movement test**, and **clefing**.

Summary of Syntax so far

- Constituents are phrases. A phrase is a string of words composed of a syntactic head, its complement (if needed), and its specifier (if any).
- All phrases follow the X'-schema:



Summary of Syntax so far

- The syntactic categories we talked about so far are: NP, VP, PP, AP, AuxP, and CP.
- Our grammar thus far has two types of rules:
 - (i) Phrase structure rules (PSRs) of the form $A \rightarrow B C$, and
 - (ii) Lexical insertion rules, which insert words into syntactic structures generated by PSRs.

Summary of Syntax so far

- A phrase structure grammar can account for grammaticality, recursiveness, and ambiguity of syntactic structures.
- However, it seems that sentence relatedness (say, between the statement in (a) and its corresponding question in (b) below) is not as readily explicable:
 - Your friend can play the piano.
 - Can your friend play the piano?
- To account for sentence relatedness, we need to enrich our theory of grammar.

Transformational rules

- Chomsky therefore proposed to include another component in the grammar in addition to the phrase structure component: a **transformational component** that consists of a set of **transformational rules**.

Transformational rules

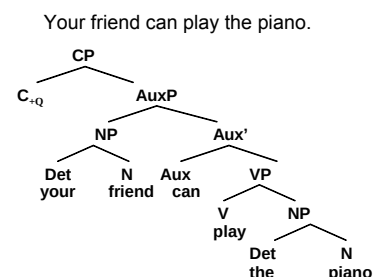
- But what is a transformational rule? A transformational rule is a syntactic operation that takes one structure as input and operates on it producing a modified syntactic structure as output.

Deep and surface structure

- For this purpose, a fundamental distinction in the grammar has to be made between two separate levels of structure:
 - a pre-transformational structure, which is called **deep structure** (or D-structure) and is derived by phrase structure rules, and
 - a post-transformational structure, which is called **surface structure** (or S-structure) and is derived through the application of transformational rules.

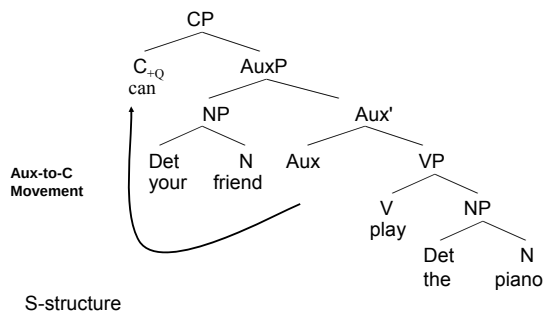
Deriving English yes-no questions

- So, let's now get back to the yes-no question "Can your friend play the piano?" and see how we can implement a transformational analysis.
- Now, instead of drawing a tree for the yes-no question directly, we actually draw a tree for the corresponding statement "Your friend can play the piano."
- The only difference is that such structure will be marked as interrogative, hence the [+Q] on C in the tree on the following slide.



(Note: [+Q] indicates this sentence is interrogative. After all, we do not want to say that both sentences are identical. They obviously are not.)

Now, a transformation moves Aux to C, thereby deriving:
Can your friend play the piano?



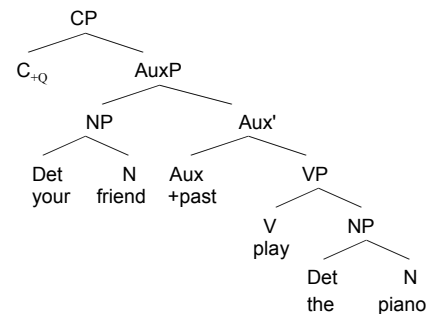
Evidence for Aux-to-C movement

- But how do we prove that there is actually Aux-to-C movement in English yes-no questions?
- Well, consider:
He asked if your friend could play the piano.
**He asked if could your friend play the piano.*

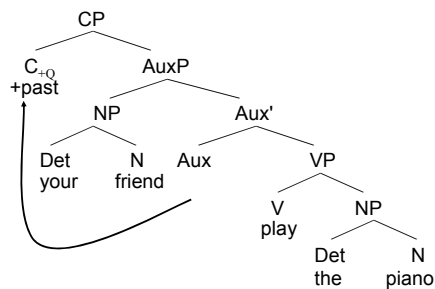
Deriving yes-no questions with "do"

- But how about yes-no questions like:
Did your friend play the piano?
- Again, let's start by drawing a tree for the D-structure of the sentence. Remember the D-structure is the corresponding statement, which in that case is?

We apply PSRs to derive the D-structure:

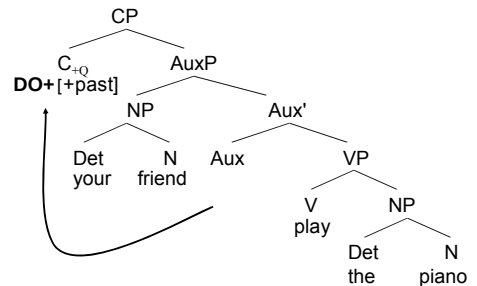


Now, since this is a question, we apply Aux-to-C movement to derive the S-structure:



- But does that give us the desired sentence?

Do-support: To derive the actual surface structure, we insert the *dummy* verb "do" to support the inflectional affix:



- Now, does that give us the desired sentence?

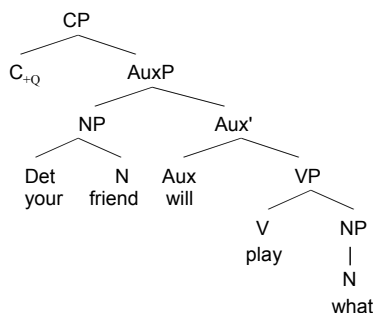
Transformations: Movement and Insertion

- So, in addition to movement, transformations can also “insert” materials in the structure of a sentence.
- Insertion rules, though, are not as many in the grammar as movement rules.

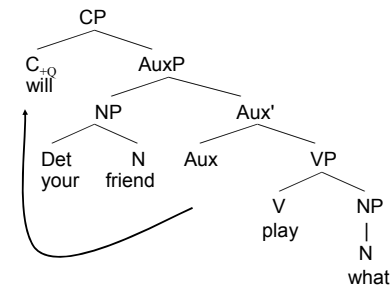
Deriving wh-questions

- Ok, let's try another kind of question, the so-called wh-questions, e.g.,
What will your friend play?
- Since “what” is interpreted as the object of “play,” we assume that this is where it starts at D-structure:
your friend will play what

We apply PSRs to derive the D-structure:



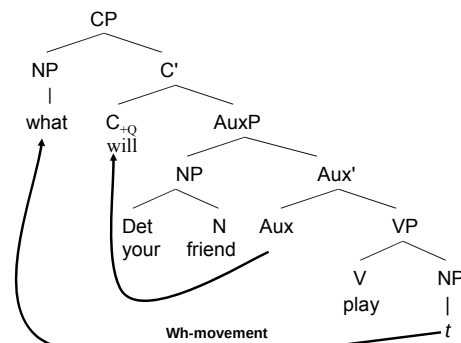
Now, since this is a question, we apply Aux-to-C movement to derive the S-structure:



- But does that give us the desired sentence?

Where do wh-phrases end up?

- To get the desired surface structure, we need to move the wh-phrase “what” to the front of the sentence.
- The question now is: Where does the wh-phrase move to?
- There is a restriction, however. It's called **structure perseverance**: *Phrases can move only to specifier positions, and heads can only move to head positions.*



- (“t” for trace of the moved phrase)

Syntax: The grammar model

Phrase structure grammar (X'-theory)

↓
D-structure

↓
Transformations (primarily Movement)

↓
S-structure

- But if this language model is universal, why do languages differ then?

Universal Grammar: Principles and Parameters

- Languages differ because UG (*Universal Grammar*, remember?) includes two components: **principles** and **parameters**. The principles are invariant; they hold in all languages. For example, structure-dependency that we talked about a week ago is a universal.
- Parameters are also universal, but unlike principles, they come in the form of (typically binary) options, and this is where the locus of cross-linguistic variation exists.

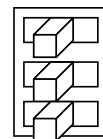
UG: principles and parameters

- As Chomsky notes:

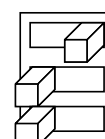
"We can think of the initial state of the faculty of language as a fixed network connected to a switch box; the network is constituted of the principles of language, while the switches are the options to be determined by experience. When the switches are set one way, we have Swahili; when they are set another way, we have Japanese. Each possible human language is identified as a particular setting of the switches—a setting of parameters, in technical terminology."

UG: principles and parameters

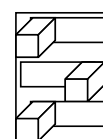
- Or, we can represent this graphically as follows:



UG



Japanese



English

UG: principles and parameters

- Under this approach, a child's job is to "set" the value of each parameter on the basis of the **primary linguistic data** (PLD) around her.
- This should explain the role of the environment in language acquisition: If you're born in Beirut, then your PLD are different from the PLD of someone born in Moscow, hence the acquired system will be different.
- Language acquisition is thus the result of interaction between *nature* (principles and parameters) and *nurture* (PLD).

UG: principles and parameters

- Ok. This is getting too abstract. Can you give us some examples of principles and parameters?
- Sure! Let me start with a parameter that helps us explain variation in basic word order across languages.

Variation in basic word order

- Even though languages may allow several word orders in sentences, each language typically has one order that is used in “neutral” contexts. This is what is called “basic word order”.
- Consider English, for example: Which of these do you think represents the “basic” word order in English?

Seafood I like.	(OSV)
Believe you me.	(VSO)
John plays the piano.	(SVO)

Basic word order

- If we confine ourselves to transitive clauses with three elements: Subject, Verb and Object (S, V, O), then we should expect **six** possible basic word orders in human language:

SVO, SOV, VSO, VOS, OVS, OSV
- Do we find these attested in natural languages?
- Actually, we do.

Basic word order

- SVO: English

John loves Mary.
- SOV: Japanese

John-ga Mary-o butta
John-SU Mary-OB hit
“John hit Mary.”

Basic word order

- VSO: Welsh

Darllenais I y llyfr
read I the book
“I read the book.”
- VOS: Malagasy

manasa ni lamba ny vihavavy
wash the clothes the woman
“The woman is washing the clothes.”

Basic word order

- OVS: Hixkaryana

Kanawa yano toto
canoe took person
“The man took the canoe.”
- OSV: Nadëb

samūy yi qa-wùh
howler-monkey people eat
“People eat howler-monkeys.”

Distribution of basic word order types in the world’s languages

- As it turns out, typological studies reveal preferences for certain word orders than others.
- Consider the frequencies reported in Tomlin’s (1986) language sample, for example:

Distribution of basic word order types in the world's languages

Word order	# of Languages	%
SOV	180	45
SVO	168	42
VSO	37	9
VOS	12	3
OVS	5	1
OSV	0	0

Distribution of basic word order types in the world's languages

- With greater than chance frequency, then, SVO and SOV orders indicate a clear preference for word order in natural languages.
- But what's even more interesting is that each of these two common orders has a set of **correlates** that go with it. To see what this means, let's compare English and Japanese.

English vs. Japanese

- English:
The child might think that she will show Mary's picture of John to Chris.
- Japanese:
Taroo-ga Hiro-ga Hanako-ni zibun-no
Taroo-SU Hiro-SU Hanako-to self-POSS
syasin-o miseta to omette iru
picture-OB showed that thinking be
"Taro thinks (literally, is thinking) that Hiro showed a picture of himself to Hanako."

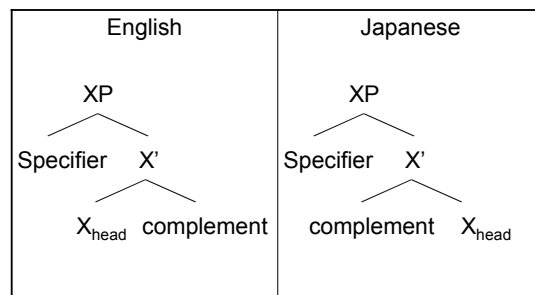
Word order correlates

Element A	Element B	English	Japanese
V	NP	A precedes B	A follows B
V	PP	A precedes B	A follows B
V	embedded CP	A precedes B	A follows B
P	NP	A precedes B	A follows B
N	PP	A precedes B	A follows B
C	embedded AuxP	A precedes B	A follows B
Aux	VP	A precedes B	A follows B

Phrase structure: English vs. Japanese

- How do we express the difference between English and Japanese in terms of the X'-schema for phrase structure then?
- Obviously, in English, heads precede their complements; in Japanese heads follow their complements.

The X'-schema in English vs. Japanese



The head directionality parameter

- The difference between English and Japanese thus comes down to the “directionality” of the head within the phrase: heads are initial in English, but final in Japanese. This is typically referred to as the **head directionality (HD) parameter**:
Heads occur initially (i.e., before their complements) or finally (i.e., after their complements) within phrase structure.

The head directionality parameter

- The head-initial setting of the HD parameter holds in English, Edo, Thai, Khmer, Indonesian, Zapotec and Salish, while the head-final setting holds in Japanese, Lakhota, Turkish, Basque, Navajo, the languages of the Eskimos, and Quechua.

How about subjects?

- Notice that the HD parameter does not say anything about the position of subjects in sentences, since these are not complements (they are specifiers, remember?). Is this good or bad?
- It's actually good, since English and Japanese are both subject-initial. We don't want to parameterize that. Rather, in both languages, the subject is the specifier of Aux:
AuxP → NP Aux'

So, why do English and Japanese look dramatically different then?

- Now, let's try to make things more interesting and see how and why English and Japanese do really look dramatically different on the surface.
- That's where trees can help for sure.
- Here are some PSRs for both languages:

English vs. Japanese

English	Japanese
CP → C AuxP	CP → AuxP C
AuxP → NP Aux'	AuxP → NP Aux'
Aux' → Aux VP	Aux' → VP Aux
VP → V (NP)	VP → (NP) V
VP → V (PP)	VP → (PP) V
VP → V (CP)	VP → (CP) V
PP → P NP	PP → NP P
NP → N (PP)	NP → PP N

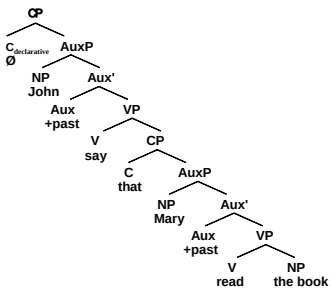
So, why do English and Japanese look dramatically different then?

- Compare English and Japanese again:
John said that Mary read the book.

John-ga Mary-ga hon-o yon-da-tu it-ta
John-SU Mary-OB book-OB read-past-comp say-past

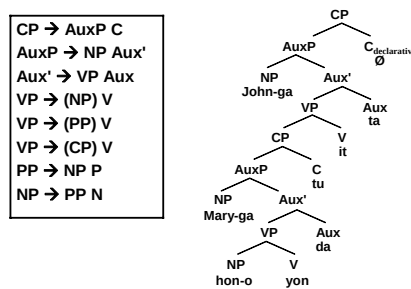
- Given the PSRs for both English and Japanese, the structural trees will look as follows:

John said that Mary read the book.



CP → C AuxP
 AuxP → NP Aux'
 Aux' → Aux VP
 VP → V (NP)
 VP → V (PP)
 VP → V (CP)
 PP → P NP
 NP → N (PP)

John-ga Mary-ga hon-o yon-da-tu it-ta
 John-SU Mary-OB book-OB read-past-comp say-past



CP → AuxP C
 AuxP → NP Aux'
 Aux' → VP Aux
 VP → (NP) V
 VP → (PP) V
 VP → (CP) V
 PP → NP P
 NP → PP N

So, ...

- The principles and parameters approach accounts for word order correlates in SVO and SOV languages in a straightforward manner.
- Notice also how a simple difference in head directionality leads to a dramatic variation on the surface, due to its cumulative effect on all heads and complements in a language.

And ...

- In addition, since the HD parameter does not apply to specifiers, it follows that both English and Japanese will behave the same with regard to the position of subjects in sentences.
- Finally, since the HD parameter has two settings only, it predicts two types of languages, SOV and SVO, which is exactly what we find in language samples: these two orders represent about 90% of human languages.

Japanenglish!

- But equally important, the HD parameter also predicts the non-existence or at least the rarity of Japanenglish-type languages, i.e., languages in which the verb precedes the object but that are also postpositional, or languages in which the verb follows the object but that are also prepositional.

Japanenglish!

- In Japanenglish-type languages we expect to find structures like this:
 Chris put the book the table on.
 Chris the book on the table put.
- But Japanenglish-type languages are rather rare, if existent. This is good news for the parametric approach since Japanenglish is predicted to be unattested under this approach.

Agenda for next class

- More on word order: The position of verb in Welsh, French, and German.
- Some universal principles of grammar: Movement out of “Islands.”
- Also first language acquisition. Read Chapter 9.

References

- Baker, M. 2001. *The atoms of language*. New York: Basic Books.
- Tomlin, Russell S. 1986. *Basic Word Order: Functional Principles*. Croom Helm, London.