CAS LX 522
Syntax I

Week 3b. Merge, feature checking 3.6-4.2

C-selection
- Verbs are recorded in the lexicon with the θ-roles they assign as part of their meaning.
- But, verbs are more selective than that.
  - Pat felt a tremor. Pat felt uncomfortable. Pat felt that Chris had not performed well.
  - *Pat is the Experiencer; a tremor (noun), uncomfortable (adjective), or that...well (sentence) is the Theme/Source. So θ-role does not determine syntactic category. And syntactic category certainly does not determine θ-role.
- So verbs also need to be recorded with information about the syntactic category they combine with.

C-selection (“Subcategorization”)
- Kick needs a nominal object.
  - Pat kicked the pail.
- Kick has a [V] category feature, but also needs to have some form of [N] category feature indicating that it needs a nominal object.
- We don’t want to risk interpreting kick as a noun, though. So, the [V] and [N] features must have a different status.
- On kick, the [V] feature is interpretable—the [N] feature is just for use in assembling the structure, it is not interpreted—hence uninterpretable.

S-selection
- Verbs also exert semantic control of the kinds of arguments they allow.
  - For example, many verbs can only have a volitional (agentive) subject:
    - Bill likes pizza. Bill kicked the stone.
    - #Pizza likes anchovies. #The stone kicked Bill.
  - We’ll assume that this is not encoded in the syntactic features, but if you mess up with respect to s-selection, the interpretation is anomalous.

Feature checking
- To model this, we will say that if a syntactic object has an uninterpretable feature, it must Merge with a syntactic object that has a matching feature—and once it’s done, the requirement is met. The feature is checked.
  - Specifically:
    - Full Interpretation: The structure to which the semantic interface rules apply contains no uninterpretable features.
    - Checking Requirement: Uninterpretable features must be checked (and once checked, they are deleted)
    - Checking (under sisterhood): An uninterpretable feature F on a syntactic object Y is checked when Y is sister to another syntactic object Z which bears a matching feature F.
To distinguish interpretable features from uninterpretable features, we will write uninterpretable features with a \( u \) in front of them.

- \( D \) has uninterpretable feature \( F \)
- \( E \) has interpretable feature \( F \).

If we merge them, the uninterpretable feature can be checked (under sisterhood).

Or, for a more concrete example

- kick is a verb (has an interpretable \( V \) feature) and \( c \)-selects a noun (has an uninterpretable \( N \) feature).
- me is a noun (a pronoun in fact, has an interpretable \( N \) feature, and others like accusative case, first person, singular).

Merging them will check the uninterpretable feature, and the structure can be interpreted.

The head is the "needy" one.
The one that had the uninterpretable feature that was checked by Merge.

The combination has the features of the verb kick and so its distribution will be like a verb's distribution would be.

- Pat wants to kick me.
- Pat wants to drive.
- I like to draw elephants.
- *Pat wants to elephants.
- *I like to draw kick me.

**glance at Pat**

\[ \text{Pat} \quad \text{[N, ...]} \quad \text{at} \quad \text{[P, uN, ...]} \]

\[ \text{glance} \quad \text{[V, uP, ...]} \]
The idea

- Sentences are generated *derivationally*, by means of a series of syntactic operations.
- A sentence that can be generated by such a procedure is grammatical. One that cannot is not grammatical.
- Syntactic operations operate on syntactic objects.
- Lexical items are syntactic objects.
- A derivation starts off by selecting a number of syntactic objects from the lexicon, and proceeds by performing syntactic operations on them.

Feature checking

- Syntactic objects have features.
- Lexical items (syntactic objects) are bundles of features.
- Some features are *interpretable*, others are *uninterpretable*.
- By the time the derivation is finished, there must be no uninterpretable features left (*Full Interpretation*).
- Uninterpretable features are eliminated by checking them against matching features. This happens as a result of Merge: Features of sisters can check against one another.
- Merge doesn’t just happen. It *has* to happen.

Heads and complements

- A syntactic object that has not projected at all (that is, a lexical item) is sometimes called a *minimal projection*.
- Where X is the category, this is alternatively called X^{\min} or X.
- The head is a minimal projection.
- In traditional terminology, the complement of a verb is generally called the *object* (or “direct object”).
- So, often, is the complement of a preposition (“object of the preposition”).
Linear order

- Merge takes two syntactic objects and combines them into a new syntactic object.
- Merge does not specify linear order (which of the two combined objects comes first in pronunciation).
- In the English VP, heads always precede complements. But languages differ on this.

The head parameter

- Languages generally have something like a basic word order, an order in which words come in in “neutral” sentences.
  - English: SVO
    - Akira ate an apple.
  - Japanese: SOV
    - John wa ringo o tabeta.
    - John top apple acc ate
  - In our terms, this amounts to a (generally language-wide choice) as to whether heads are pronounced before complements or vice-versa.
    - English: head-initial
    - Japanese: head-final

Second Merge

- Merge occurs when there is a selectional feature that needs to be satisfied.
- If there is more than one such feature, Merge must happen more than once.
- As always, the node that projects is the one whose selectional feature was satisfied by the Merge.
  - The sister of the head (that projects) after the first Merge involving that head is called the complement (as above).
  - The nonprojecting sister of a syntactic object that has already projected once from a head is called the specifier.

Specifiers, heads, and complements

- A transitive verb like called needs two arguments (the caller and the callee).
- We encode this knowledge by hypothesizing two selectional features for N.
  - The first selectional feature will be checked by the callee.
  - The second selectional feature will be checked by the caller.
- So, called is Merged with me.

Specifiers, heads, and complements

- So, called is Merged with me.
- One of the selectional features is checked off, the remaining features project to the new object.
- A selectional feature still remains.
- Merge applies again, Merging the new object with they.
- The second selectional feature has been eliminated.
- The sister to this second Merge is the specifier.
- A node that does not project further is a maximal projection.
- A node that has been projected and projects further is neither maximal nor minimal and is usually called an intermediate projection.
Specifiers, heads, and complements

- In English, specifiers are on the left of the head.
- Unlike complements, which are on the right.
- As with the head-complement order, languages (arguably) also differ in the linear order of their specifiers.
- However, Spec-initial order is overwhelmingly more common...

VOS order (Malagasy)
Nahita ny mpianatra ny vehivavay.
The woman saw the student.

Historical note: X'-theory

- In the ’70s and ’80s, these ideas went by the name “X'-theory”.
- Every XP has exactly one:
  - head (a lexical item)
  - complement (another XP)
  - specifier (another XP)
  - for any X (N, V, A, P, I, etc.)

Merge vs. X'-theory

- The system of selectional features and Merge is preferable because it gets this structure without stipulating the template.
- The structure assigned to sentences is generally the same—except that for us, there are no intermediate or maximal projections unless they are needed.

Adjuncts

- “Pat put the book.
- Pat put the book on the shelf.
- Pat put the book on the shelf dramatically
- Pat put the book on the shelf dramatically on Tuesday.
- Pat put the book on the shelf dramatically on Tuesday before several witnesses.

- Some things are required. Some things are not.
  - Arguments get θ-roles and are required.
  - Adjuncts are modificational and are optional.

Adjuncts and distribution

- Adjuncts are relatively “transparent”—having an adjunct does not seem to change the distributional characteristics.
  - Pat wants to eat lunch (quickly).
  - Pat wants to dine.
  - *I like to draw eat lunch (quickly).
  - I like to draw (happy) elephants.
  - *Pat wants to (happy) elephants.

- Idea: A verb (phrase) with an adjunct is still a verb (phrase), just as if it didn’t have an adjunct.

Adjoin

- The operations Merge and Adjoin are two different ways to combine two objects from the workbench.
  - Merge takes two objects and creates a new object (with the label/features inherited from one of them).
  - Adjoin attaches one object to the top of another one.

- The linear order of adjuncts does not appear to be set parametrically, so they can either before or after the object they attach to.

quickly
eat
to
dine

Adjoin
The luxury of adjunction

- We will also assume that Adjoin only applies to maximal projections.
- That is: If a syntactic object still has a selectional feature, Adjoin cannot attach something to it. Merge must happen first. Once all of the things that need to happen are taken care of, then you have the luxury of adjunction.

A phrase

- So, a full phrase can have all of these pieces (plus perhaps some additional adjuncts)

Complements vs. adjuncts

- Any number of adjuncts can be added, and generally in any order.
- Adjuncts come in many different categories—“adjunct” is not a category, but rather a structural description.

Quickly

Pat

ate

lunch

Colonel

Mustard

killed

Mr.

Boddy

in the study

before

tea

with the candlestick

VP

V

VP

PP

VP

PP

VP

PP

A phrase

maximal projection

minimal projection

specifier

head

complement

intermediate projection

X

X′

[. . .]

Complements vs. adjuncts

- PPs seem to be freely reorderable—when they are adjuncts.
- I ate lunch on Tuesday at Taco Bell with Pat
- I ate lunch on Tuesday with Pat at Taco Bell
- I ate lunch with Pat on Tuesday at Taco Bell
- I ate lunch on Tuesday with Pat at Taco Bell
- etc...
- But consider glance at Chris.
- I glanced at Chris on Tuesday
- *I glanced on Tuesday at Chris
- Ok: Why?