CAS LX 522
Syntax I

Week 4a.
θ-roles, feature checking 
(3.5-5.6)

*Trees*

- Root node
- Nodes (with node labels)
- Branches
- Terminal nodes
- Nonterminal nodes

**Tree relations**

- A node X *dominates* nodes below it on the tree; these are the nodes which would be pulled along if you grabbed the node X and pulled it off of the page.
- Acts as a unit. Is a constituent.

**Verbs and substitution**

- One of the ways we know a verb is a verb (category) is by observing that it can substitute for other verbs.
  1) Pat likes to sing. Pat likes to drive.
  2) Pat bought a book. *Pat bought (a) sing.
  3) Pat likes to eat sandwiches.
  4) *Pat unpleasant to eat sandwiches.
- So is eat sandwiches a verb?
- Well, kind of, yes.
- It's a constituent, a phrase, that has the properties a verb does. A verb *phrase*.

**The making of a phrase**

- We're trying to characterize our knowledge of syntactic structure.
- Our grammatical knowledge is a system (we can judge new sentences).
- All things being equal, a theory in which the system is simpler (needed fewer assumptions) is to be preferred over a theory that entails more complex one.
The making of a phrase

• In that spirit, we know that a phrase differs from a word in that it contains words (or other phrases).
• We’ve seen that when words are combined into a phrase, the phrase inherits the properties of one of the things we combined. (The phrase has a head).
• Suppose: a phrase can arise from merging two words together, with one taking priority. In a way, attaching one word to another.

What will Pat do?
• sing
• eat sandwiches
What does Pat like?
• to eat sandwiches
• to sing
• [to [eat sandwiches]]
• So, a phrase can also arise from combining to and a verb phrase, to make a bigger phrase.

Merge

• So, let’s go for the simplest theory of structure we can (and only move away from it if the simplest theory won’t work)
• A phrase is a syntactic object formed by combining (merging) two syntactic objects, with the properties inherited from one of them (the head of the phrase).
• A word is a syntactic object.

Merge, in the abstract

• A good way to think about this is that we have a number of syntactic objects lying around on a workbench of sorts.
• We use the operation Merge to assemble them together into one syntactic object.

Merge, in the abstract

• We combine D and E using Merge to form a combined syntactic object.
• We need to call our new object something, so we call it C.
• C is now a syntactic object (containing D & E).
• D and E are now “off the table”—we can’t Merge D with anything because it’s inside C. (“Merge only combines objects at their root nodes”).

Merge, in the abstract

• Since C is now a syntactic object, we can combine C with the other syntactic object, B, to form a new syntactic object we’ll call A.
• Now, all we’re left with is the single syntactic object A.
Merge, in the abstract

• When two objects are merged, one of them is the head, the most important one.
• The head determines the properties of the constituent—that is, the features of the head project to become the features of the whole combined object.

Trees and constituency

• Pat will eat lunch.
• Pat will dine.

Trees and constituency

• Pat will eat lunch.
• Pat will dine.

So how do we know which is the head?

• When we merge two things, one is the head, and determines the properties of the resulting syntactic object.

• The next thing we’ll turn to is the question of how the syntactic system knows which is the head.

This is a proposition

• Let’s try to ground this a bit more now, to make it clearer what problems we’re solving here.
• A primary—and perhaps the most important—type of sentence is that which represents a proposition.
• A proposition is the kind of thing that can be true or false (basically).
Truth and Verbs

1) Michael swam.
   • *Michael*: refers to an individual; it is a name, a label. It is complete.
   • *Swam*: describes an action that can be undertaken by someone, or a property that someone can have. Someone. *Swam* can’t be true—it needs an individual, then it can be true (or false).

Predicates and arguments

1) Michael swam
   • *Swam* needs an individual to be true or false. Fortunately, *Michael* is an individual. So, combining *swam* (predicate) and *Michael* (argument) gives us a proposition, that can be true or false.

Verbs and participants

• Intransitive (1-place): *Sleep*
  1) Bill slept.
  2) *Bill slept the book.
• Transitive (2-place): *Hit*
  3) *Bill hit.
  4) Bill hit the pillow.
• Ditransitive (3-place): *Put*
  5) *Bill put.
  6) *Bill put the book.
  7) Bill put the book on the table.
• Weather (0-place): *Rain*
  8) *It rained.

Verbs and arguments

• The “participants” in an event denoted by the verb are the arguments of that verb.
• Some verbs require one argument, some require two arguments, some require three arguments, some require none.
• Intuitively, the number of arguments is the number of things that a verb needs in order to make a proposition (something that can be either true or false).

Predicates

• We will call verbs the predicates. They define properties of and/or relations between the arguments.
1) Bill hit the ball
   • There was a hitting. Bill did the hitting. The ball was affected by the hitting.
• Different arguments have different roles in the event. (e.g., The hitter, the hittee)

Thematic relations

• The thematic relation that the argument has to the verb—the role it plays in the event—will prove useful in describing the behaviors of different classes of verb.
• One thematic relation is agent of an action, like *Bill* in:
  1) Bill kicked the ball.
Common thematic relations

- Agent: initiator or doer in the event
- Theme/Patient: affected by the event, or undergoes the action
  1) Sue kicked the ball.
- Experiencer: feel or perceive the event
  3) Pat likes pizza.
- Proposition: a statement, can be true/false.
  3) Bill said that he likes pizza.

Common thematic relations

- Goal:
  1) Chris ran to Copley Square.
  2) Pat gave the book to Tracy (Recipient)
- Source:
  3) Mary took a pencil from the pile.
- Instrument:
  4) Ed ate the burrito with a plastic spork
- Benefactive:
  5) Pat cooked dinner for Chris.
- Location:
  6) Betsy sits under the tree on Wednesdays.

Thematic relations

- Armed with these terms, we can describe the semantic connection between the verb and its arguments.
- Ray gave a grape to Bill.
  - Ray: Agent, Source, …
  - A grape: Theme
  - Bill: Goal, Recipient, …

Required vs. optional

- Things with certain thematic relations don’t seem to be needed by a given verb, but can be there. E.g., location.
  1) Pat screamed (in the library).
- Others, like theme/patient, goal, or agent, often do seem to be required. (“Required” means even if left out, there is something assumed)
  2) Chris gave a book to Pat.

θ-roles

- An argument can participate in several thematic relations with the verb (e.g., Agent, Goal).
- In the syntax, we assign a special connection to the verb called a “θ-role”, which is a collection of thematic relations.
- For the purposes of syntax, the θ-role (the collection of relations) is much more central than the actual relations in the collection.

θ-roles

- We will often need to make reference to a particular θ-role, and we will often do this by referring to the most prominent relation in the collection.
- For example, in Bill hit the ball, we say that Bill has the “Agent θ-role”, meaning it has a θ-role containing the Agent relation, perhaps among others.
**Unique θ Generalization**

- Each θ-role must be assigned to a constituent, but a constituent cannot be assigned more than one θ-role.
- Historically, the “θ-criterion.”
- Verbs have a certain number of θ-roles to assign (e.g., say has two), and each of those must be assigned to a distinct argument.

**Selection**

- Verbs, as part of their meaning (that is, whatever is recorded in the lexicon), are often “selective” about what kinds of arguments, θ-roles they have.
- What verbs are said to do here is select for certain things.
- There are quite a number of things that verbs “care about.”

**C(category)-selection (" subcategorization")**

- Verbs that take objects differ in what they allow the syntactic category those objects to be. Suppose the ball is category N (NP) and that Bill left early is category C (CP):
  1) Sue saw/hit the ball.
  2) Sue saw/*hit that Bill left early.

**Feelings**

- The verb feel seems to have an Experiencer and a Theme/Source. But the Theme/Source can be any of several different syntactic categories. So: θ-role does not determine syntactic category; nor does syntactic category determine θ-role.
  1) Pat felt a tremor.
  2) Pat felt uncomfortable.
  3) Pat felt that Chris had not performed well.

**Kickings**

- The verb kick seems to require a nominal (category N) argument.
- Verbs differ, so we need this to be recorded in the lexicon.
- Kick is a verb. It has a [V] feature.
- It “needs” a noun. Nouns have an [N] feature. But we need to distinguish between being and needing.

**Interpretability**

- The difference between “being” and “needing” will be referred to as a difference in interpretability.
- Being a verb, kick has an interpretable [V] feature.
- Needing a noun, kick has an uninterpretable [N] feature.
- The name gives a hint as to why the N is required. The uninterpretable [N] feature is dangerous. It must be gotten rid of. Otherwise, there will be something we can’t interpret.
Feature checking

• For our model, 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 uninterpretable feature is checked.

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).
Feature checking

- 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.

1) Pat wants to kick me.
2) Pat wants to drive.
3) I like to draw elephants.
4) *Pat wants to elephants.
5) *I like to draw kick me.

Chris glanced at Pat

Pat [ ] Chris [ ]
at [ ] glanced [ ]