Assumptions (Week 9)

1 Well-formedness

We have developed a theory of syntax in which well-formedness is determined by the interaction of two systems: the lexicon and the generative component. Lexical entries are feature structures that characterize the idiosyncratic properties of particular lexical items: their phonological properties, their semantic properties, and the unique (morpho-)syntactic requirements that determine their syntactic distribution. The features introduced by particular lexical items become part of a syntactic representation, and may be inherited by larger structures, as determined by the principles of the generative component (MERGE, MOVE and AGREE). Some features must be 'discharged' over the course of a derivation, while others must be 'valued'; derivations in which members of the former category are not discharged or members of the latter category are not valued are not well-formed. The syntactic derivation itself is a kind of proof: a demonstration that every subtree of a larger structure satisfies both the lexical requirements imposed by its subconstituents and the more general structural constraints imposed by the generative component.

2 The Lexicon

Lexical entries are complex feature structures containing (at least) syntactic, semantic and phonological information about each morpheme in the language. The syntactic features for an arbitrary lexical item LI are as shown in (1).

(1)
$$\begin{bmatrix} \mathit{LI} & \\ \text{CAT} & \mathit{val} \\ \text{INFL} & \begin{bmatrix} x\text{FORM} & \mathit{val} \\ y\text{FORM} & \_ \end{bmatrix} \\ \text{AGR} & \begin{bmatrix} z\text{FORM} & \mathit{val} \end{bmatrix} \\ \text{SEL} & \begin{bmatrix} \text{COMP} & \mathit{val} \\ \text{SPEC} & \mathit{val} \end{bmatrix} \end{bmatrix}$$

The CAT feature specifies the syntactic category of a lexical item, and can be a single feature or a set of features. The value of a CAT feature could be can be as general as N(oun) or as specific as {T(ense), +PAST}.

The INFL feature complex controls the (syntactically determined) surface shape of the lexical item. This information may be explicitly specified in a lexical entry, as with the *y*FORM value in (1), which has the value *val* (for example, the pronoun that is pronounced *she* in matrix subject position is a lexical item whose ϕ features are valued {3, SING, FEM}); or it may be 'unvalued', indicated with an underline, as with the *z*FORM feature in (1) (this is the case with the CASE feature of the forementioned pronoun). Unvalued features may become valued through the AGREE relation, defined below. Derivations that result in unvalued INFL features are ungrammatical.

The AGR feature determines the kind of agreement that a LI triggers on another syntactic object; the representation in (1) indicates that LI licenses valuation of another object's xFORM feature as *val*. (Here xFORM is just a placeholder for some other feature — VFORM, CASE, whatever.)

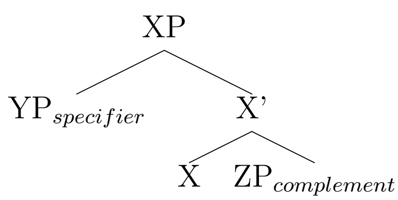
The SEL feature complex specifies the selectional requirements of a lexical item. It is further subdivided into a COMPlement feature and a SPECifier feature, each of which have categories (or possibly ordered lists of categories, though I have not shown this in (1)) as their values. The difference between specifiers and complements concerns order and position within the phrasal projection of a head. Specifically:

1. Heads first combine with complements, then with specifiers. That is, all COMP features must be discharged first.

2. Languages may specify the relative ordering of head, complement, and specifier.

In English, complements are ordered to the left of the head, and specifiers are ordered to the right of the head (and any complements), giving us structures like (2).

(2)



Note that nothing in principle rules out the possibility that different heads impose different ordering requirements on the things they select — e.g., that a head X wants its complements on the right, and a head Y wants them on the left. If we discover that this is the case, we will need to figure out some way of encoding this in the lexical entries of the relevant heads.

3 The generative component

Our generative component contains three (or maybe two) rules: AGREE, MERGE and MOVE. MOVE is defined in terms of MERGE, so is arguably not a separate principle, but to keep things as clear as possible I will define it separately here. The details are as stated in (3)-(4).

(3) MERGE
If X is a syntactic object with undischarged SEL feature α and Y is a syntactic object with CAT feature α:

i. Form Z such that Z immediately dominates X and Y.
ii. Discharge (delete) α on X.
iii. Let the features of Z = the features of X.

(4) MOVE

If X is a syntactic object with undischarged SEL feature α and Y is a syntactic object with CAT feature α and X contains Y:

i. Form Z such that Z immediately dominates X and a copy of Y.
ii. Discharge (delete) α on X.
iii. Let the features of Z = the features of X.
iv. Delete the original occurrence of Y.

The two significant differences between MERGE and MOVE is that the latter states explicitly that the selected object Y is part of the structure that is already built (this is the 'contained within X' clause), that what gets merged to X is a copy of Y, and that the original gets deleted. It may very well be that none of these things need to be stipulated at the end of the day — that MOVE really can be viewed as a special case of MERGE where the selected object comes from structure that is already built ('internal merge') rather than from the lexicon ('external merge'), and that the deletion requirement follows from general principles governing the mapping from syntax to phonology. For the moment, though, we can treat them as two separate (though related) principles, just to keep things as clear and explicit as possible.

The AGREE rule is formulated as in (5).

(5) AGREE

If syntactic object X has an unvalued INFL feature F_1 and syntactic object Y has a matching valued AGR feature F_2:

i. Let the value of F_1 = the value of F_2.
ii. Discharge (delete) F_2 on Y.

At various points we considered the possibility that AGREE applies locally, in particular that a syntactic object X can value the INFL features only of constituents within its maximal projection (its specifier(s) or complement(s)). By the end of the class, however, we determined that none of the data we considered actually supported this position, and that (so far) we do not have any reason to stipulate any constraints on the domain over which AGREE applies. We did however assume that AGREE applies at each instance of MERGE, and that it applies

4 TP

Sentences are projections of the category T(ense). English contains at least three members of the T category (and probably more): *past, present* and *nonfinite*. The former do not correspond to free morphemes, but do trigger appropriate agreement on lower verbs; the latter corresponds to the morpheme *to*. T selects for a complement of category V and a specifier of category N; the latter corresponds to the subject of the sentence. T also is the locus of subject agreement: it has unvalued ϕ-features (person, gender, number) which are valued under agreement with its specifier (the subject). T heads in general select for a complement of category V and a specifier of category N or C.

We have not settled on a particular view about how tense information ends up on the highest verb. One coherent option is that this is done under agreement: that e.g. PAST has the feature structure in (6), which allows it to trigger agreement on a lower verb (which we must assume has an unvalued TENSE feature in its INFL array, or that TENSE is really a special type of VFORM feature).

(6)
$$\begin{bmatrix} \text{CAT} & \{\text{T}, +\text{PAST}\} \\ \text{INFL} & \begin{bmatrix} \phi & \_ \end{bmatrix} \\ \text{AGR} & \begin{bmatrix} \text{TENSE} & \text{PAST} \\ \text{CASE} & \text{NOM} \end{bmatrix} \\ \text{SEL} & \begin{bmatrix} \text{COMP} & \text{V} \\ \text{SPEC} & \text{N} \,|\, \text{C} \end{bmatrix} \end{bmatrix}$$

There are other options however. For example, it could be the case that tense morphology is is part of T's morpho-phonological features (an aspect of lexical feature structures that we have in general been ignoring), rather than an AGR feature, but that it gets pronounced on an adjacent verb because it is somehow not phonologically 'robust' enough to stand on its own.

5 Semantic roles

Semantic roles are those features of a lexical item that represent the participants in the situation or event described by the item. (The most common expressions with semantic roles are verbs, though other categories may be associated with them as well.) For example, the verb *eat* describes an eating event, which necessarily includes a thing that gets eaten and a thing that eats it; the verb *sleep* describes a sleeping event which has only a sleeper participant, and the verb *rain* describes an event that has no participants at all (you don't need any individuals to have raining; you just need the rain, but the verb takes care of naming that).

In class, we assumed that semantic roles, or θ-roles, are linked to selected arguments, and we represented this by attaching a line from different roles (θ_1, θ_2, etc., or θ_{Agent}, θ_{Theme}, etc., if you prefer) to different selected arguments. (Because I haven't figured out how to do lines in my typesetting program, however, I will use subscripts here.)

Note that non-NP arguments may be associated with θ-roles. For example, the clausal argument of *seem, appear*, etc. should get a role, along with the (optional) *to*-PP argument (as in *It seems to me that ...*).

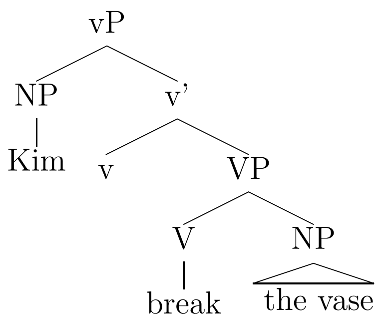
Note also that not all lexical items assign θ-roles. For example, we do not want to say that auxiliary verbs assign a semantic role to their VP complements, since auxiliaries don't really describe events. Instead, they 'manipulate' the event described by the main verb (by specifying whether it is ongoing, completed, etc.). Likewise, we don't really want to say that T(ense) assigns a semantic role, since it just specifies when in time a particular event occurs.

When providing a lexical entry for a term that does assign semantic roles — in particular, when giving lexical entries for main verbs and predicative adjectives — you should be sure to specify not just the selectional requirements of the item, but also how the selected arguments link up to θ-roles.

6 Transitivity: V and *v*

Transitive verbs select only for their 'internal' arguments: syntactic direct objects/semantic 'themes' or 'patients'. Their surface subjects and semantic 'agents' are introduced by a special causative head, which we are calling *little v*. For example, the structure of the smallest projection consisting of the verb *break* and all its potential arguments is as in (7).

(7)



Passive and intransitive inchoative constructions are derived by leaving out little-*v*, which in turn results in the underlying object moving to subject position. (In our current set of assumptions, this happens because this is the only way to satisfy both the SEL requirements of T and value all unvalued case features on nominal expressions.)

Something that we haven't seriously addressed is the question of which verbs can appear without little-*v*. All transitive verbs can do this when they are 'passivized' (i.e., in the presence of be_{psv}), but only some verbs can form non-passive intransitive variants. Such verbs form a coherent semantic class: they describe 'true changes of state' (*break, melt, drop, scratch, fill, ...*), but this is a description, not an explanation. At some point, something more needs to be said about this.

7 Case

All nominals (including expletive *it*) enter the derivation with unvalued CASE inflectional features that must be valued in the course of a derivation, via AGREE. For example, the lexical entry for *dog* looks like (8).

(8)
$$\begin{bmatrix} \textit{dog} & \\ \textsc{cat} & \text{N} \\ \textsc{infl} & \begin{bmatrix} \textsc{case} & \_ \end{bmatrix} \end{bmatrix}$$

We currently have posited two 'triggers' for case assignment: finite T and little-*v*. The former values NOM(inative) case and the latter values ACC(usative) case:

(9)
$$\begin{bmatrix} \textsc{cat} & \left\{\text{T}, \textit{past/pres}\right\} \\ \textsc{infl} & \begin{bmatrix}\phi & \_\end{bmatrix} \\ \textsc{agr} & \textsc{nom} \\ \textsc{sel} & \begin{bmatrix} \textsc{comp} & \text{V} \\ \textsc{spec} & \text{N} \mid \text{C} \end{bmatrix} \end{bmatrix}$$

(10)
$$\begin{bmatrix} \textsc{cat} & v \\ \textsc{infl} & \begin{bmatrix}\textsc{vform} & \_\end{bmatrix} \\ \textsc{agr} & \textsc{acc} \\ \textsc{sel} & \begin{bmatrix} \textsc{comp} & \text{V} \\ \textsc{spec} & \text{N}_{\theta_{Ag}} \end{bmatrix} \end{bmatrix}$$

Note that the assumption that AGREE can apply non-locally predicts that the subject of an embedded non-finte clause, such as *Kim* or *Nancy* in the following examples, can get its case feature valued without moving:

(11) a. *It seems [$_{\text{TP}}$ Kim to be happy].
b. *It is likely [$_{\text{TP}}$ Nancy to be Speaker of the House].

According to our assumptions, *seem* and *likely* are not associated with a little-v projection, but the finite T in the matrix clause can value NOM on the embedded subjects. However, given the formulation of the AGREE rule in (5), once a trigger for agreement values the INFL feature of a target, its AGR feature is discharged; this means that a trigger for case can value one and only one case feature. It follows that if e.g. *Kim* in (11a) has its CASE feature valued by the matrix T, there will be no way for expletive *it* to have its case feature valued. This means that insertion of an expletive to satisfy the SEL requirements of matrix T is not an option; only movement of the lower subject to the matrix subject position will result in a well-formed representation.

That said, on the Tuesday before Thanksgiving, we considered the possibility that AGREE may not be completely unconstrained. In particular, we hypothesized that AGREE cannot apply across a CP boundary. This, together with the assumption that verbs like *try* and *hope* select for CPs with null C heads, explains the impossibility of (12a-b).

(12) a. *Kim tried [$_{\text{CP}}$ $\emptyset$ [$_{\text{TP}}$ herself to win the race]]
b. *Lee hopes [$_{\text{CP}}$ $\emptyset$ [$_{\text{TP}}$ the Bears to win the game]]

If *try* and *hope* are associated with little-v (which would seem to be the case, given that their subjects bear agentive semantic roles), then the subjects of the embedded non-finite clauses should be able to have case valued by little-v (as with so-called ECM verbs like *want* and *like*). If there is a CP layer separating the matrix and embedded clauses that blocks AGREE, however, then we have an explanation for the impossibility of these examples: the embedded subjects cannot have their case features valued. (Another possibility to consider is that the CP itself absorbs the case feature associated with little-v; if this were the case, we might not need to stipulate a locality condition on AGREE after all.) Instead, we have to use PRO, which does not need case, resulting in (13a-b).

(13) a. Kim tried [$_{\text{CP}}$ $\emptyset$ [$_{\text{TP}}$ PRO to win the race]]
b. Lee hopes [$_{\text{CP}}$ $\emptyset$ [$_{\text{TP}}$ PRO to win the game]]

The reason why examples parallel to (12a-b) are OK with ECM verbs, on this view, is because such verbs select for TPs rather than CPs, and AGREE is not blocked:

(14) a. Kim wants [$_{\text{TP}}$ herself to win the race]]
b. Lee expects [$_{\text{TP}}$ herself to win the game]]

These verbs can also select for the same kinds of CPs as *try* and *hope*, in which case we get the 'control' variants *Kim wants to win the race* and *Lee expects to win the game*.

All this leaves open the question of why PRO does not need case, however. The simplest way of dealing with this would be to just assume that it is specified for case in the lexicon, as in (15) (where κ is just an arbitrary placeholder for whatever we want to call the case associated with PRO), though this is really a stipulation and not an explanation.

(15) $$\begin{bmatrix} \text{PRO} & \\ \textsc{cat} & \text{N} \\ \textsc{infl} & \begin{bmatrix} \text{CASE} & \kappa \end{bmatrix} \end{bmatrix}$$

8 Case and movement

At one point in the class we considered the possibility that NPs move only to satisfy their own needs (e.g., the requirement that their CASE feature be valued), never (only) to satisfy the syntactic requirements of some other expression (e.g., the SEL requirement of some head). The reason for considering this was that it seemed to be the best way to rule out movement out of finite clauses, as in (16a-b).

(16) a. *Kim seems (that) [$_{\text{TP}}$ ~~Kim~~ is happy].
b. *Nancy seems (that) [$_{\text{TP}}$ ~~Nancy~~ will be Speaker of the House].

Since the NPs *Kim* and *Nancy* can have their CASE features valued without movement (by the lower finite T heads), they should not move.

Our current set of assumptions accounts for the ungrammaticality of (16a-b) without this stipulation, however, by assuming instead that AGR features must be discharged. Given the definition of AGREE in (5), a particular head can discharge its AGR features only if there is some other expression in the representation that contains an unvalued INFL feature of the appropriate type. This means that the problem with (16a-b) is not the movement *per se*, but the fact that once the NPs *Kim* and *Nancy* have their

CASE features valued by the lower finite T heads, there is nothing in the respective sentences for the matrix T heads to establish an AGREE relation with, and so no way for them to discharge their AGR features. If instead we insert expletives, as in (17a-b), these features can be discharged through agreement with the unvalued CASE features on the expletives.

(17) a. It seems (that) Kim is happy.
  b. It seems (that) Nancy will be Speaker of the House.

It may eventually be the case that we discover that movement should be somehow restricted, but our current assumptions conspire to license just the grammatical sentences and to rule out the ungrammatical ones without adding extra stipulations about when movement can and cannot occur.