Topics in English Syntax: Rules, Categories, Complement Selection

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1 Rules

1.1 PS Rules

Any approach to syntax needs some way to specify what sorts of structures are possible in a language.

A traditional way to specify what sorts of constituent structures are possible is with Phrase Structure (PS) Rules. They take the form in (1) and have the interpretation in (2):

(1) C1 → C2 C3 . . . Cn

(2) A C1 can have as daughters a C2, a C3 . . . , and a Cn in that order.

PS rules give information (a) about what daughters some category can have and (b) about what order the daughters appear in.

An obvious PS rule for English is (20), which has the interpretation in (21).

(3) VP → V NP

(4) A VP can have as daughters a V and NP in that order.

- ID Rules Much work in syntax assumes not PS rules, but Immediate Dominance (ID) rules. These give information about what daughters some category can have but say nothing about the order of the daughters. Other rules (Linear Precedence, LP, rules) deal with this.

ID rules have the form in (22) (with commas between the items on the right hand side) and have the interpretation in (23).

(5) C1 → C2, C3, . . . Cn

(6) A C1 can have as daughters a C2, a C3 . . . and a Cn.

An obvious ID rule is (24), which has the interpretation in (25).

(7) VP → V, NP

(8) A VP can have as daughters a V and NP.

The order of elements on the right hand side of an ID rule is of no significance. Hence, (9) means the same as (7).

(9) VP → NP, V

- Cross-linguistic Generalisations With ID rules we can say that English with examples like (10) and Turkish with examples like (11) have the same rule in (7):

(10) The cat saw the dog.

(11) Kedi köpeğ i gör dü. (Turkish)
cat dog ACC see PAST
'The cat saw the dog.'

If we assumed PS rules, English would have the PS rule in (12a) and Turkish would have the different PS rule in (12b)

(12) a. VP → NP V
b. VP → V NP

- Mono-lingual Generalisations The following are plausible rules for English:

(13) a. VP → V NP (saw Sam)
b. N′ → N PP (teacher of English)

c. PP → P NP (in a box)
d. AP → A PP (happy about the situation)
e. CP → C S (that she arrived)

There is a generalisation here: lexical heads precede phrases.

Thus, it would be better to express these rules in as ID rules, as in (14), and state the LP principle separately:

(14) a. VP → V, NP (saw Sam)
b. N′ → N, PP (teacher of English)
c. PP → P, NP (in a box)
d. AP → A, PP (happy about the situation)
e. CP → C, S (that she arrived)

Of course, the principle is even clearer with a strictly head-final language like Japanese.

2 Syntactic categories

The labels that are applied to words and phrases are standardly known as syntactic categories, and it is standardly assumed that they are complex entities made up of features of various kinds. Thus, NP, VP, etc. are abbreviations for something complex.

In some frameworks it is quite common to spell out categories in their full complexity, but in others this is rare.

In all frameworks it is necessary in some situations to have more precise labels than NP and VP.

For example one might want to make it clear that *the cat* is a singular NP and *the cats* a plural NP. This is commonly done by adding appropriate features and values to the basic label, as follows (where following HPSG practice the feature is in upper case and the value in lower case italics):

(15) a. NP [NUM *sing*]
b. NP [NUM *plur*]

Similarly one might want to identify the bracketed VP in (48a) as finite and that in (48b) as containing a base form:

(16) a. The cat [saw the dog]
b. The cat may [see the dog]

One might do this as follows:

(17) a. VP [VFORM *fin*]
b. VP [VFORM *base*]

The features we have looked at so far are *atomic* (they have atomic values), but it is common in theories that take features seriously to allow other kinds of values, e.g.

- values that are themselves collections of features
- list values (values that are lists of various kinds)
- set values (values that are sets of various kinds)

With this apparatus we can get very simple accounts of complementation and agreement.

3 Complementation

The following is in the spirit of HPSG.

It is very commonly assumed (in many different frameworks) that phrase are of three basic kinds:

- head+specifier (including head+subject)
- head+complements
- head+adjunct

Potential Examples (these are ID rules, so the order does not matter, but for readability I write them in a way that reflects the English order):

- Head-specifier (subject) Structures

(18) a. NP → DET, N′
b. S → NP, VP

- Head-complement Structures

(19) a. VP → V, NP (cuddled a baby)
b. N′ → N, PP (teacher of English)
c. CP → C, S (whether she cuddled a baby)
d. PP → P, NP (on the table)
e. AP → A, PP, PP (grateful to her parent for everything)

- Head adjunct Structures

(20) a. NP → NP, PP (a baby with a hat)
b. VP → VP, PP (leave on Tuesday)

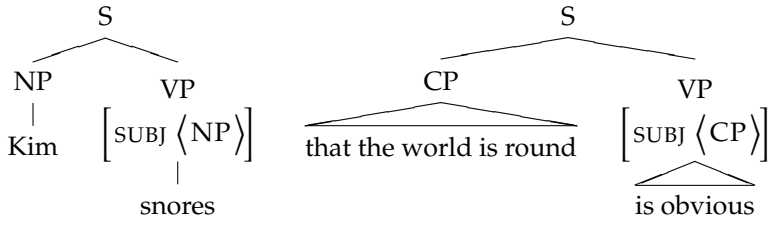
- This ignores a lot of important theoretical questions:
  - e.g. about how uniform X′ theory is;
  - e.g. about whether VP is the head of S;
  - e.g. about whether we can identify SUBJ and SPR roles
- The clearest evidence for the distinction between head-complement and head-specifier phrases comes from languages like English, where there is good evidence for a VP and N′ constituents (it might be more difficult to motivate on the basis of languages like Japanese, where it might be more natural to assume a 'flatter' structure)
- It leads many people to think there is an important difference between subjects and complements.
- One way of dealing with subject+verb phrase structures is to assume that verb phrases have a feature as part of their label whose value indicates what sort of subject they require.

For example, in HPSG it is normal to assume that subject requirements are encoded in a feature SUBJ, whose value is a list with one member when some element requires a subject (and with no members when it does not require a subject). Assuming this feature we might have the 'subject-predicate' ID rule in (21a), which has the interpretation in (21b).

(21) a. $S \rightarrow X, VP\left[\text{SUBJ } \langle X \rangle\right]$
b. A sentence can consist of a constituent of some kind and a VP that licenses that constituent as a subject.

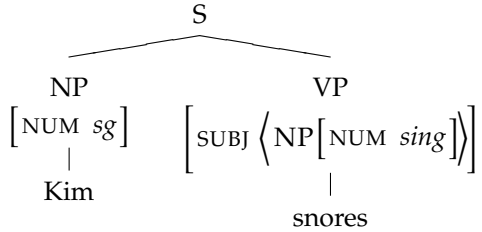
This will license structures like the following:

(22)



- Notice we cannot just assume that all subjects are NPs.
- More interestingly, it will also license structures like (23):

(23)



- So we have the beginnings of an approach to subject verb agreement, case, etc.

- We will return to this next week.

3.1 Head-Complement Structures

We can apply the same approach to complements.

Some examples:

(24) a. Kim watched [NP Sandy].
b. Kim is [PP in Ipswich].
c. Kim put [NP the book] [PP on the table]
d. Kim sent [NP Sandy] [PP to Tokyo].
e. Kim talked [PP to Sandy] [PP about the weather].
f. Kim told [NP Sandy] [S that he was too late].
g. Kim said [PP to Sandy] [NP that he was too late].
h. Kim seemed [S/VP to impress Sandy].
i. Kim is [AP afraid of spiders].

In (24h) the complement might be analysed as VP or a subjectless clause (S).

- Prepositions It not just verbs that take complements.

Prepositions generally take an NP complement.

(25) a. from [NP London]
b. since [NP Monday]
c. before [NP the lecture]

But there are other possibilities:

(26) a. from [PP under the bed]
b. since [NP before the War]/[S Kim left]
c. before [S the lecture started]

- Nouns and Adjectives Nouns may also take a complement:

(27) a. picture [PP of Lee]
b. teacher [PP of English]
c. possibility [S that it will rain]

So can adjectives.

(28) a. afraid [PP of spiders]
b. possible [S that it will rain]
c. grateful [PP to her parents] [PP for everything]

The fact that members of the same word class can differ in what complements they take suggests that they must incorporate information about what complements they require.

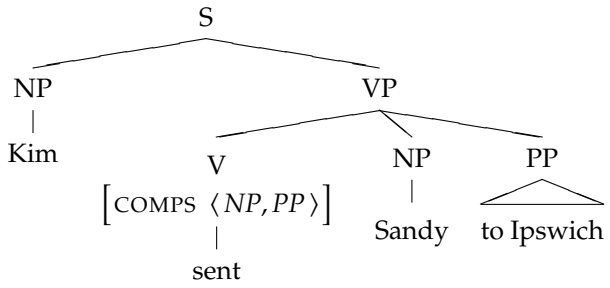
Following HPSG, we might do this with a list valued COMPS feature, giving categories like the following:

(29) a. *send*: $\mathrm{V}\left[\textsc{comps}\ \langle NP, PP \rangle\right]$
b. *from*: $\mathrm{P}\left[\textsc{comps}\ \langle NP \rangle\right]$
c. *picture*: $\mathrm{N}\left[\textsc{comps}\ \langle PP \rangle\right]$
d. *afraid*: $\mathrm{A}\left[\textsc{comps}\ \langle PP \rangle\right]$

These will interact with the head-complement ID rule in (30a), which has the interpretation in (30b), or more roughly (30c):

(30) a. $\mathrm{XP} \rightarrow \mathrm{X}\left[\textsc{comps}\ \langle Y1, \ldots, Yn \rangle\right], \mathrm{Y1}, \ldots \mathrm{Yn}$
b. A phrase of some kind can consist of a related lexical element requiring certain complements and the complements that it requires.
c. A phrase consists of a head, and the complements the head requires.

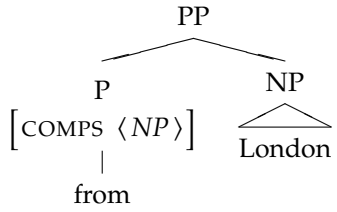
(31)



Similarly:

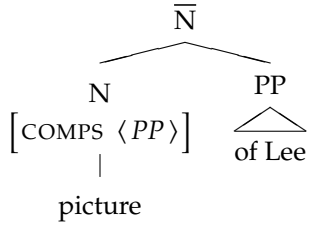
(32) a. from London

b.



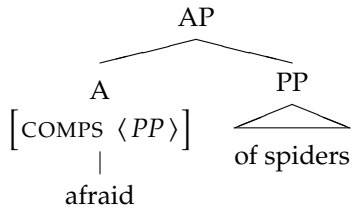
(33) a. picture of Lee

b.



(34) a. afraid of spiders

b.



For head-adjunct structures, we need a different approach.

We do not want to say that heads select their adjuncts – rather the other way round, e.g. adjectives can only modify nouns, adverbs *cannot* modify nouns (but can modify adjectives, e.g.):

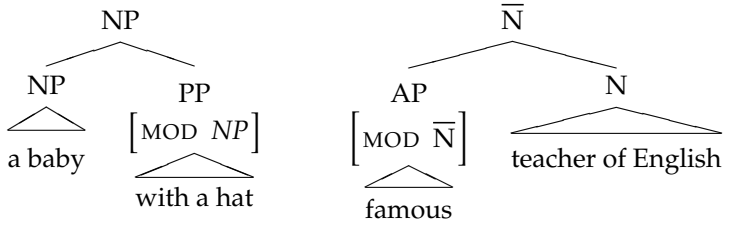
(35) a. a remarkable idea
b. *a remarkably idea

(36) a. *remarkable good
b. remarkably good

In HPSG this is handled by giving adjuncts MOD feature, which describes what they can be adjoined to, so for head-adjunct structures, we have a rule like (37):

(37) a. XP → YP [MOD *YP*], XP
b. An XP can consist of a XP phrase, and a adjunct that can modify XPs

(38)



You may wonder why SUBJ and COMPS are both list valued features, but MOD is not. The reason is that it is sometimes conventient to join (append) SUBJ and COMPS values, but nothing similar

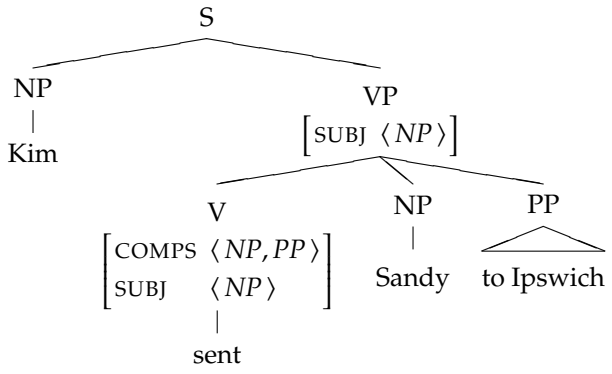
ever happens to MOD values.

4 Putting it All Together and Filling in some Details

- We have discussed complement selection and subject selection separately, but we should deal with them together.
- We have not explained the relationship between abbreviations like NP, VP, and explicit feature descriptions like $\left[\text{SUBJ } \langle NP \rangle\right]$.
- We have not explained how to phrasal properties other than COMPS values are projected from lexical items.

- COMP and SUBJ Selection
  - Predicates vary both in the complements they allow, and the subjects they allow (prepositions, and adjectives typically don't allow any), so we have to specify both
  - We can see a combination of subject and complement selection in (39).

(39)



- To make explicite that VP and V have the same value for SUBJ we could revise the head-complement ID rule in as follows:

(40) $\text{XP}\left[\text{SUBJ } \boxed{1}\right] \rightarrow \text{X}\begin{bmatrix}\text{SUBJ} & \boxed{1} \\ \text{COMPS} & \langle Y1, \ldots, Yn \rangle\end{bmatrix}$, Y1, ... Yn

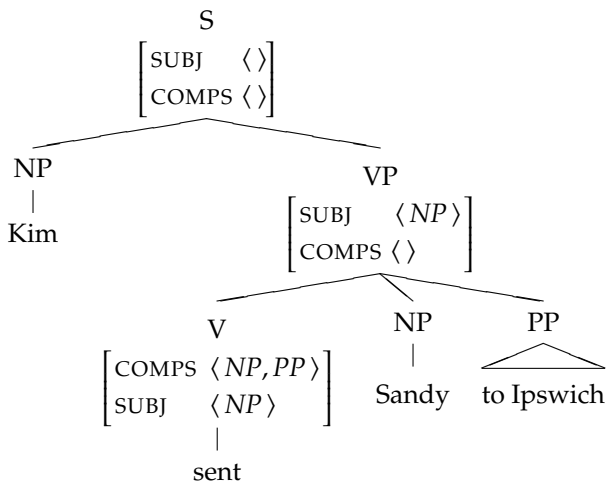
- Here the $\boxed{1}$ means 'the same' – i.e. XP and X have the same value for SUBJ

This has the following interpretation(s):

(41) a. A phrase of some kind can consist of a related lexical element requiring certain complements and the complements that it requires; the phrase and the lexical element have the same value for SUBJ.
b. a phrase that is looking for a subject consists of lexical item that licenses that subject, and some complements, so long as the lexical item licenses those complements

We could be more explicit in the representation:

(42)



- The intuition here is that once a head has found its complements, they are 'cancelled' from its list of requirements;
- Similarly, when a VP has found the subject it needs, the subject is cancelled from the SUBJ list.
- The formulation in (40) entails that PP and P, NP and N, and AP and A also have the same value for SUBJ. There is room for debate, but we might assume that SUBJ has the value ⟨ ⟩ in all these categories and we could add $\left[\text{SUBJ } \langle\ \rangle\right]$ to these categories in the above trees.

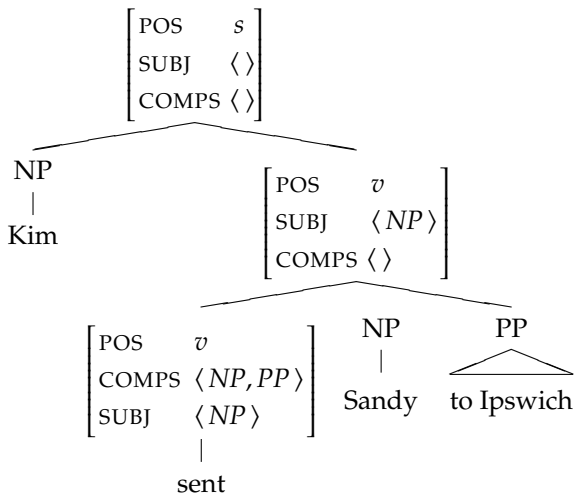
We should be explicit about what abbreviations like N, V, P, and NP, VP, and PP etc. mean.

The simplest idea is that N abbreviates something like (43a), V abbreviates (43b), etc. (POS is for 'part-of-speech')

(43) a. $\left[\text{POS } n\right]$
b. $\left[\text{POS } v\right]$

So, to be more explicit, (40) should be (44) (and NP, and PP should also be expanded everywhere):

(44)



We should reformulate the rules so that POS values are identified between mother and head:

(45) $\begin{bmatrix}\text{POS } \boxed{1}\\ \text{SUBJ } \boxed{2}\end{bmatrix} \rightarrow \begin{bmatrix}\text{POS } \boxed{1}\\ \text{SUBJ } \boxed{2}\\ \text{COMPS } \langle Y1, \ldots, Yn \rangle\end{bmatrix}$, Y1, ... Yn

We should do the same thing for MOD values, since the MOD value of a phrase depends on the MOD value of its head (the reason adjective phrases can only modify nouns, is that adjectives are specified this way in the lexicon)

- X-bar Syntax

We could consider adding X-bar syntax features, like 'bar-level', but perhaps we don't need to, because part of what this is intended to capture is the distinction between X^0 which have not combined with their complements, and $\overline{X}$, which have:

(46) a. $X^0 = \left[\text{COMPS } \langle \ldots \rangle\right]$
b. $\overline{X} = \left[\text{COMPS } \langle\,\rangle\right]$

Perhaps we get all the distinctions we need if we classify phrases by how 'saturated' they are (whether their heads have found their complements, whether they have found their complements *and* their subjects). We may have all we need if we *define* VP to be a 'COMPS saturated V that has not yet found its SUBJ, as in (47):

(47) $\begin{bmatrix} \text{POS} & v \\ \text{SUBJ} & \langle [] \rangle \\ \text{COMPS} & \langle\,\rangle \end{bmatrix}$

(Though notice that this definition means that an intransitive verb is actually a VP – it is not clear if this is matters at all). We could also *define* S as an abbreviation:

(48) $\text{S} = \begin{bmatrix} \text{POS} & v \\ \text{SUBJ} & \langle\,\rangle \\ \text{COMPS} & \langle\,\rangle \end{bmatrix}$

(which would entail that VP is the head of S).

- Open Questions
  - We have dealt with the possible values of COMPS and SUBJ, but what are the possible values of POS?
  - We have not assumed POS, SUBJ, and COMPS are all 'top-level' features, but maybe there should be some more organisation, e.g. where should features related to agreement, case, etc. go?
  - This is all rather stipulative – could we find a way of making it less stipulative, and more general?

5 Reading

On the topics discussed today, see for example: Borsley (1999) chapter 2; Tallerman (2011), chapters 3 and 5.

On HPSG, see for example, Kim and Sells (2008), Sag et al. (2003), Müller (2016) Chapter 9, Pollard and Sag (1994) Chapter 1.

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