

PS Traditional Syntax (Summer 2006)

Additional notes along chp. 6 of the Kaplan Book (pt. 1)

Everything on this handout is relevant for the final exam!

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June 14, 2006

Note: On this handout, I mark object language expression by *italics*, not by ‘quotes’.

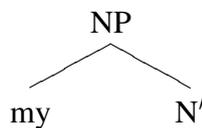
1 Generation

- assumption: sentences/utterances are generated from smaller units (ultimately: words)
- words form phrases, phrases sentences (sentences and clauses are just specific types of phrases)
- **intermediate phrases**: strings of $1 \dots n$ words which are not ‘standalone’ like sentences but have a characteristic/typical behavior as a group (Kaplan’s ‘phrases’)
- **constituent**: simple words or any n words which are joined by immediate concatenation (by a PS rule, cf. below)
- growing structure is built containing levels of simpler structure: leads to **hierarchical structures**
- concatenating words to ever larger phrases: **bottom-up generation**
- deconstruction/analysis of large unit into ever smaller units: **top-down analysis**

2 The three notations

- rules about how to build up admissible phrases: **phrase-structure rules** (PS rules):
 - general format: $\alpha \longrightarrow \beta \dots$ (‘ α goes to $\beta \dots$ ’ or technically ‘ α rewrites as $\beta \dots$ ’)
 - example: $S \longrightarrow NP VP$ (a sentence is composed of an NP and a VP)
 - optionality of PS rules: $VP \longrightarrow V$ or $VP \longrightarrow V NP$ (two admissible VP structures)

- with optional material: $VP \longrightarrow V (NP)$
 - class sensitive (much more useful than last VP rule): $VP \longrightarrow V_{itr}$ or $VP \longrightarrow V_{tr} NP$
 - recursiveness: $NP \longrightarrow NP \text{ conj } NP$ (output is or contains a possible input)
 - NP and N, VP: examples of **non-terminal categories** (constituents, but not lexical entries)
 - **terminal symbols**: real word/lexical entry inserted into the structure at the end
 - $N \longrightarrow (woman, man, child), V_{tr} \longrightarrow (love, kill), \text{ etc.}$
- constructed by such rules: hierarchical structure which can be rendered in **bracket notation**:
 1. Take the left-hand side PS symbol and create a labelled bracket from it, e.g. $[NP \dots]!$
 2. Take every right-hand PS symbols and create a labelled bracket from it if it is non-terminal or just write the symbol down if it is terminal, e.g. $[NP \text{ my } [N' \dots]]$ from $NP \longrightarrow \text{ my } N'!$ ¹
 3. Fill the inserted brackets according to other rules until every ‘inmost’ bracket is filled with terminal symbols!
 - equivalent **tree** construction:
 1. Instead of creating a labelled bracket in (1), write down the top **node** for the constituent, e.g. $N!$
 2. For every right-hand symbol draw a **branch** downward from the top node and label it by the terminal or non-terminal symbol!



3 The tests and exceptions

3.1 Substitution

- as already noticed in the NP/N case: *Peter* behaves like *a man* etc.
- VP ‘walks’ has same **distributional pattern** as VP *brutally killed the man whom I don’t know with a knife*
- It doesn’t matter that the substitutions change the meaning, the substituted elements have the same grammatical status, the syntactic rules which construct the sentence treat them as equal!

¹ The rules in this section of the handout only serve illustrative purposes. They might be complete nonsense and not part of any specific grammar which I propose.

- *Peter*
He
The man all our examples are about ... watched TV.
- **failure:** spurious substitution option (esp. with Kaplan's one-word substitution criterion):
I ...
... like to walk alone and Peter sleeps.
... walk.

3.2 Displacement/Movement

- Probably because the construction of meanings of phrases depends on phrase structure, constituents must stick together when they are 'moved' around (or displaced). Notice that displacement is a very strange and unique property of human language.
- We mark the place from where something was displaced/moved by a coindexed trace t_i .
- *Laura went quickly [into the woods].* (hypothetical constituent)
[Into the woods]_i Laura went quickly t_1 . (seems correct!)
- **failure:** partial (VP) fronting, remnant topicalization in many languages:
Er wird ihr [den Ring schenken] können. (VP constituent)
[? Schenken können] wird er ihr den Ring. (oops!)

3.3 Conjunction

- generally a very solid test for constituenthood
- **failure: argument cluster coordination**
 - a sensible rule for transitive verbs: $VP \longrightarrow V_{dtr} NP NP$
 - [VP give [NP Peter] [NP a book]] (some structure omitted for clarity)
 - obviously, [NP Peter] [NP a book] no constituent
 - however:
[S [NP Sam] [VP gave [? $?$ [NP Peter] [NP a book]]] and [? $?$ [NP Mary] [NP a DVD]]]]
 - unclear status of the coordinated elements

4 Minor remarks

4.1 Preliminary Remark on the Structure of S

- why not: $S \longrightarrow NP V NP?$
- intervening adverbs: *She **obviously** [VP likes *Linguistics*].*
- intervening AUX: *She **will** [VP write about on phrase structure].*
- better generalization: **All** verbs have a subject, the number of objects varies. The generalization about subjects is covered by $S \longrightarrow NP VP$, the numbers of objects are introduced by various VP rules.

- and already implicit: VP behaves as a constituent in all four tests!

4.2 Ambiguity

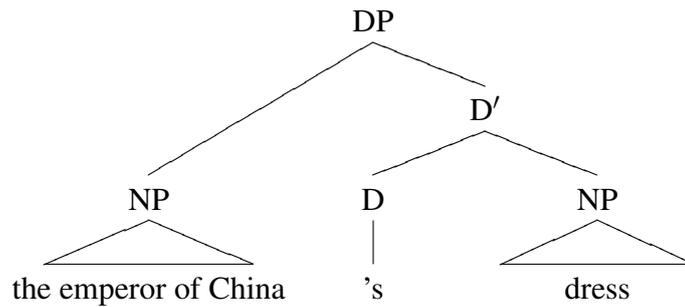
- The more PS rules are available, the more structures generating the same output string are available to the grammar.
- derive: *Scully saw the man with the telescope.* in two ways giving the necessary PS rules plus brackets **and** tree notation!

4.3 The name of a phrase

- Words enter into PS rules because they are compatible with the structure described by the rule. If you insert a V_{itr} into a rule constructing a transitive VP, the rule doesn't apply, and your **derivation** fails right away.
- The rules help the words to consume the other words and phrases which they want to consume (the phrases for which they subcategorize).
- The word which determines the **categorial status** (the 'word class status') of the phrase is the one that gives the phrase its name, it's the **head of the phrase**. The head also determines the other **obligatory phrases** to be included in the phrase which it heads (as in the case of transitive and intransitive Verbs). In the case of NPs, the noun also determines the φ features of the NP.
- Those elements which enter optionally but don't change the categorial/featural status of the phrase under construction are **adjuncts** (typically adverbials, adjectives, etc.). They are typically licensed by rules where the left-hand side is a category label which appears again on the right-hand side, e.g.: $N' \rightarrow AP N'$.
- Notice a problem: If the head is the word that determines the categorial status, the φ features (if applicable) and the number of required additional phrases, then at least NPs are problematic. The categorial status and the definiteness seem to be determined by the Det, because without it (except in generic plural NPs), the NP cannot function as an NP (i.e., it cannot be the subject/object of a sentence or the object of a PP). This lends some plausibility to the alternative analysis in 4.4. The problem is, however, not a trivial one.

4.4 A Note on Prenominal Genetives

- complex prenominal genetives in English: $[_{NP} [the\ emperor\ of\ china]'s\ dress]$
- Kaplan's structure: $[_{NP} [_{Det} [_{NP} the\ emperor\ of\ China]\ 's] dress]$
- required PS rules: $NP \rightarrow Det N'$ and $Det \rightarrow NP 's$
- The last rule is a bit awkward. Usually, Det is a lexical category (*the* etc.), so we might not want to have complex determiners of such a form.
- An alternative structure was thus suggested, where 's is a D which takes the NP as a complement:



- For some languages, like Hungarian, this structure is extremely plausible for other reasons.

4.5 A Note on Names

- Kaplan's structure for proper names: $[_{NP} [_{N'} [_{N} \text{Peter}]]]$
- an adjective rule which we obviously need: $N' \rightarrow AP N'$
- an NP rule which we also need: $NP \rightarrow Det N'$
- one possible result with the Kaplan system (slightly abbreviated) $[_{NP} a [_{N'} [_{AP} \text{red}] [_{N'} \text{Peter}]]]$
- A reasonable solution would be to have the following rule instead: $NP \rightarrow Peter$ (same for pronouns).
- Kaplan tries to avoid the problems by postulating that you cannot add adjuncts and determiners to an N' which is based on a 'proper name N' '. Such a special condition could also be expressed in phrase-structure rules. The required rules are called context-sensitive. They require an extended formalism and significantly boost the complexity of the theory. In this case, however, such a rule is completely nonsense, because we have a much nicer and simpler solution!
- **Doing it like Kaplan (in this case) will be considered false in the final exam!**

4.6 A Note on Nouns and Compounds

- *Russian* as an adjective: adjoins to N'
- in *Russian teacher* (teacher who teaches Russian): *one* test for N' fails
- also, *Russian* is a noun in this case
- The structure $[_{N'} N N]$ is not a valid one-headed structure, though!
- semantic relation between first noun and second is arbitrary (hence lexically determined): *Jägerschnitzel* vs. *Schweineschnitzel*
- So, such constructions are lexically stored **compounds**, i.e. single but complex Ns which can have special meanings. We do **not** analyze them in the syntax but in the component for **word formation!**

- notice: accent shift (word-internal accent pattern!): *Russian téacher* (N') vs. *Rússian teacher* (N).
- One of the Ns, the **head of the compound**, determines the grammatical features of the whole compound (e.g., φ and category):
 The **chár woman** came in. **She** cleaned the room.
 The **rúnning gag** was told. **It** was anaphorically referred to by a neuter noun, not a verb!
- **Doing it like Kaplan (in this case) will be considered false in the final exam!**