The Definitive Phrase Structure Rules

Everything on this handout is relevant for the final exam!

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July 11, 2006

General Disclaimer

Note that systems of PS rules are not a matter of divine inspiration. They are meant to describe in **some** reasonable fashion how larger strings of words are concatenated in phrase structures. There might be several adequate ways of describing English in PS rules, as you will continue to discover during the next semesters.

The rules included in this set are 'cleaner' than the ones I introduced in the previous sessions. For example, I have simplified the Aux system a bit, but all arguments in favor of the old structure carry over to this defninitive rule set.

1   NP and Det

Summary: We construct noun phrases from nouns which are lexical items. We project them to N, N′ and NP level. However, there are lexical items which have the categorial status of an N′ (like *one*) or an NP (like *she* or *Queen Victoria*). At certain levels, adjuncts may attach. Adjuncts are

optional, don't change the categorial status of the constituent they attach to, and they thus usually introduce high potential of recursion in a very simple way. On this handout, such adjunct rules are marked by ⋆.

The grey material in the examples is material which is **not** inserted by the rule – it serves illustrative purposes since it could be inserted by other rules.

name	rule	description	bracketed example
N1.1	N → (*book, table, water, Rússian teacher, . . .*)	common nouns	[N water]
N1.2	N$_{of}$ → (*writer, destruction, . . .*)	nouns with *of* PP-complement	[N$_{of}$ writer]
N2.1	N′ → *one*	*one* N′ anaphor	[N′ one]
N2.2	N′ → N	trivial N′ construction	[N′ [N car]]
N2.3	N′ → N$_{of}$ PP$_{of}$	N and *of* complement combine	[N′ [N$_{of}$ writer] [PP$_{of}$ of novels]]
N2.4 ⋆	N′ → N′ PP	PP adjunct	[N′ [N′ book] [PP about Proust]]
N2.5 ⋆	N′ → AP N′	AP adjuncts	[N′ [AP red] [N′ book]]
N3.1	NP → (*she, we, Queen Victoria, PRO, . . .*)	proper names and pronouns	[NP she]
N3.2	NP → Det N′	determiner completes NP	[NP [Det the] [N′ violent destruction of the city]]
N4.1	Det → (*the, some, . . .*)	determiners	[Det the]
N4.2	Det → NP *'s*	prenominal genetives as Det	[Det [NP the queen of England] s]

Note: In this system, all complex NPs need a determiner. We would have to deal with bare NPs like *water* or *cars* in *Water tastes fine.* or *I like cars.* in a more subtle way. We just leave this to be solved in future semesters.

Compounds – to put it clearly once again – are **one word** and have no syntactic structure. They are thus introduced as in rule N1.1.

2   AP

name	rule	description	bracketed example
A1.1	A → (*red, former, . . .*)	simple adjectives	[A red]
A2.1	AP → A	trivial adjective-only APs	[AP [A red]]
A2.2	AP→ Int A	APs with intensifiers	[AP [Int very] [A red]]
A3.1	Int → (*very, quite, . . .*)	intensifiers	[Int very]

Notes: Actually, some adjectives take complements, as in *hard to read* or *kind of Sue*. We would have to formulate conditions to the effect that *hard* takes only *to*-infinitives as complements, and that *kind* takes an *of*-complement and can only be used predicatively (i.e., you cannot say *a kind of Sue gift*). We leave the details to be worked out in future semesters.

3   VP and VP-Adverbs and Negation (1)

Summary: Within the VP, we deal with valency by indexing. Again, we introduce complements under V' .

name	rule	description	bracketed example
V1.1	$V_{itr} \rightarrow$ (*walk, . . .*)	intransitive verbs	[V_{itr} walk]
V1.2	$V_{tr} \rightarrow$ (*kill, love, . . .*)	transitive verbs	[V_{tr} kill]
V1.3	$V_{dtr} \rightarrow$ (*donate, give, . . .*)	ditransitive verbs	[V_{dtr} give]
V1.4	$V_{ptr} \rightarrow$ (*contemplate, . . .*)	prepositionally transitive verbs	[V_{ptr} contemplate]
V1.5	$V_{atr} \rightarrow$ (*behave, . . .*)	adverbially transitive	[V_{atr} behave]
V1.6	$V_{scv} \rightarrow$ (*think, deny, . . .*)	sentential complement verbs	[V_{scv} think]
V2.1	$V' \rightarrow V_{itr}$	trivial	[V' [V_{itr} walk]
V2.2	$V' \rightarrow V_{tr}$ NP	verb and object	[V' [V_{tr} kill] [NP a man]]
V2.3	$V' \rightarrow V_{dtr}$ NP NP	verb and two objects	[V' [V_{dtr} give] [NP a woman] [NP the car keys]]
V2.4	$V' \rightarrow V_{ptr}$ PP	verb and prepositional complement	[V' [V_{ptr} contemplate] [PP on the subject of death]]
V2.5	$V' \rightarrow V_{atr}$ VAdv	verb and subcategorized adverb	[V' [V_{atr} behave] [Adv well]]
V2.6	$V' \rightarrow V_{scv}$ S'	verb and object clause	[V' [V_{scv} think] [S' that Mary likes her brown cat]]
V3.1 ⋆	$V' \rightarrow V'$ PP	adjunct PPs	[V' [V' walk] [PP on the street]]
V3.2 ⋆	$V' \rightarrow$ VAdv V'	adjunct preverbal V-adverbs	[V' [Adv quickly] [V' tested the bulbs]]
V3.3 ⋆	$V' \rightarrow V'$ VAdv	adjunct postverbal V-adverbs	[V' [V' tested the bulbs] [Adv quickly]]
V4.1	VAdv $\rightarrow$ (*well, quickly, . . .*)	VP adverbs	[VAdv well]
V5.1	$VP_S \rightarrow$ NP V'	subjects for VPs (= S)	[VP_S [NP Mary] [V' loves a woman]]
V5.2	$VP_U \rightarrow V'$	trivial VP to combine with Aux	[VP [V' love a woman]]
V5.3	$VP_U \rightarrow$ Neg V'	negation with one Aux	[VP_U [Neg not] [V' love a woman]]
V6.1	Neg $\rightarrow$ *not*	negation particle	[Neg not]

Notes: The prepositionally transitive verbs should actually 'know' what preposition they need. We just assume that they do – otherwise we would have to introduce a lot of additional indexing. The same goes for V_{scv} which require *that* clauses sometimes, but sometimes also *whether* (e.g., *wonder*). Again, we assume that we could add this extra knowledge to the grammar.

4   AuxP, ModP and Negation (2)

name	rule	description	bracketed example
S1.1	Aux → (*has, do, did, ...*)	temporal Aux/*do*	[Aux do]
S1.2	Aux′ → Aux VP$_U$	temporal Aux and *do* combine with VP	[Aux′ [Aux does] [VP$_U$ not love a woman]
S1.3	AuxP$_S$ → NP Aux′	subjects for AuxP (=S)	[AuxP$_S$ [NP Mika] [Aux′ does not love a woman]
S1.4	AuxP$_U$ → Aux′	trivial AuxP to combine with Mod	[AuxP$_U$ [Aux′ have thrown the bolt]]
S1.5	AuxP$_U$ → Neg Aux′	negation with Mod and Aux	[AuxP$_U$ [Neg not] [Aux′ have thrown the bolt]]
S2.1	Mod → (*may, might, ...*)	modals	[Mod might]
S2.2	Mod′ → Mod (AuxP$_U$, VP$_U$)	Mod combines with subjectless AuxP/VP	[Mod′ [Mod might] [VP$_U$ have thrown the bolt]]
S2.3	ModP → NP Mod′	subjects for ModP (= S)	[ModP [NP Thor] [Mod′ might have thrown the bolt]]
S3.1	SAdv → (*obvisouly, probably, ...*)	sentential adverbs	[SAdv probably]
S3.2 ⋆	Aux′ → SAdv Aux′	sentential adverbs for sentences with Aux	[Aux′ [SAdv probably] [Aux′ has lost the game]]
S3.3 ⋆	Mod′ → SAdv Aux′	sentential adverbs for sentences with Mod	[Mod′ [SAdv probably] [Mod′ could have lost the game]]

Notes: I have simplified things a bit compared to the handout. We do no harm in assuming that *been walking* etc. are verb forms introduced by variants of V1.1 through V1.5. In essence, the reason is that they never occur alone and always trigger the *-ing* morphology at the verb.

Again, our rules are not constrained enough. We do not express the fact that *have* AuxPs do only take VPs with certain morphological markings of the verb (*has **walked***, *has **been walking***, etc.).

Negation is actually trickier in English than the rules suggest. Take these as an approximation.

You might notice that the placement of adverbs is freer than the rules allow (involving subtle changes in meaning). I'm convinced that PS grammars are inadequate tools to handle free adjuncts in general. But, fortunately, you can just ignore that and pretend things were as simple as the rules make them seem.

5 Embedded S

name	rule	description	bracketed example
K1.1	Comp → (*that, whether, …*)	complementizer	[Comp that]
K1.2	$S' \to$ Comp (VP_s, $AuxP_S$, $ModP_S$)	complement clauses	[S' [Comp that] [$ModP_S$ Mika might have lost the game]]
K2.1	SC → (*while, when, although, …*)	subordinating conjunctions	[SC while]
K2.2	$S_{adj}' \to$ SC (VP_s, $AuxP_S$, $ModP_S$)	adjunct clauses	[S_{adj}' [SC while] [VP_S the dog barks]]
K2.3 ⋆	$VP_S \to VP_S\ S_{adj}'$	adjunct clause to 'S'	[VP_S [VP_S the cat sleeps] [S_{adj}' while the dog barks]]
K2.4	same as K2.3 for $AuxP_S$		
K2.5	same as K2.3 for $ModP_S$		

6 Coordination

name	rule	description	bracketed example
C1.1	CC → (*and, or*)	coordinating conjunctions	[CC and]
C1.2	$\alpha \to \alpha$ CC α for any α	same category coordination	for N' : [N' [N' cats] [CC and] [N' dogs]]