Frank Richter:
Grammatikformalismen für die Computerlinguistik

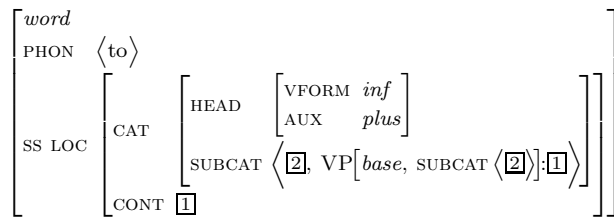## Homework Assignment 8   Due: June 23rd

Exercise 1. [2 points]
Consider the phrase in (1):

(1) the smart student

Draw an AVM description (using the abbreviatory tree notation) of this phrase
which comprises the following information: The ID SCHEMA which licenses each
phrase, the identities caused by the HEAD FEATURE PRINCIPLE, the SUBCAT
list of each sign with the identities between the elements on different SUBCAT
lists and the SYNSEM values of non-head daughters in the syntactic tree, the
MOD value of the adjective and the structure identity it introduces, and the
CONTENT values of the word *student*, the word *smart* and the complete phrase
the smart student.

Exercise 2. [4 + 1 points]
In (124) on page 143 of their book Pollard and Sag give us the following infor-
mation about their idea of the lexical entry of the auxiliary verb *to*:

$$
\begin{bmatrix}
word \\
\text{PHON} \quad \langle \text{to} \rangle \\
\text{SS LOC} \begin{bmatrix}
\text{CAT} \begin{bmatrix}
\text{HEAD} \begin{bmatrix} \text{VFORM} & inf \\ \text{AUX} & plus \end{bmatrix} \\
\text{SUBCAT} \left\langle \boxed{2}, \text{VP}\big[base, \text{SUBCAT } \langle \boxed{2} \rangle\big] : \boxed{1} \right\rangle
\end{bmatrix} \\
\text{CONT} \quad \boxed{1}
\end{bmatrix}
\end{bmatrix}
$$

With the lexical entry for the infinitival auxiliary *to* they intend to license sen-
tences such as the one shown in (2a). However, if we only consider the principles
of grammar as Pollard and Sag list them in their appendix, the principles and
the lexical entry above also license (2b) as a saturated verbal projection of
English.

(2) a. John seems to run.

   b. * To John run.

1. Draw an AVM (with the tree notation) for (2a) and (2b) which indicates
   the constituent structure the grammar assigns to the two expressions.
   Mention the following facts about the two expressions in your description:
   Number of the ID SCHEMA by which each phrase is licensed; elements
   on the SUBCAT lists of each sign, and identities with elements on other
   SUBCAT lists; identities caused by the SUBCATEGORIZATION PRINCIPLE
   and the HEAD FEATURE PRINCIPLE.

2. How can the grammar be changed in order to exclude the expression in (2b)? You may want to consider what Pollard and Sag say on page 41 about inverted structures in English.

   Any simple solution compatible with the major facts of English grammar is acceptable, but please keep your proposal small and simple.

Exercise 3. [4 points]
Sketch the relevant parts of the lexical entries of *tend* and *try*, and use the data in (3) and (4) to justify your decisions.

(3) a. Peter tends to annoy Mary.

    b. = Mary tends to be annoyed by Peter.

    c. It tends to rain.

    d. There tends to be trouble in Berlin.

(4) a. Peter tries to annoy Mary.

    b. ≠ Mary tries to be annoyed by Peter.

    c. * It tries to rain.

    d. * There tries to be trouble in Berlin.

Exercise 4. [Extra Credit: 2 points]
Assume the signature of the grammar by Pollard and Sag, including the relation symbol `member` of arity 2. Further assume that the grammar contains a MEMBER PRINCIPLE along the lines we discussed in class (also contained in the textbook on "Grammar Formalisms and Parsing", p. 253).
Use the `member` relation to write a grammar principle (in AVM notation or in MoMo notation, as you prefer) that formalizes the following idea: *Every non-initial nominal member of a* SUBCAT *list is accusative.*