Chapter 5, Problem 1: Two Kinds of Modifiers in English

A. Head-Modifier Rule 2

$$[\textit{phrase}] \rightarrow \begin{bmatrix} \text{SYN} \begin{bmatrix} \text{VAL} \begin{bmatrix} \text{COMPS} & \langle\ \rangle \\ \text{MOD} & \langle\ \boxed{1}\ \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix} \quad \mathbf{H}\boxed{1}\begin{bmatrix} \text{SYN} \begin{bmatrix} \text{VAL} \begin{bmatrix} \text{COMPS} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

B. Head-Modifier Rule 1

$$[\textit{phrase}] \rightarrow \mathbf{H}\boxed{1}\begin{bmatrix} \text{SYN} \begin{bmatrix} \text{VAL} \begin{bmatrix} \text{COMPS} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix} \begin{bmatrix} \text{SYN} \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{POST-HEAD} & + \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{COMPS} & \langle\ \rangle \\ \text{MOD} & \langle\ \boxed{1}\ \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

A. Head-Modifier Rule 2

$$[\textit{phrase}] \rightarrow \begin{bmatrix} \text{SYN} \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{POST-HEAD} & - \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{COMPS} & \langle\ \rangle \\ \text{MOD} & \langle\ \boxed{1}\ \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix} \quad \mathbf{H}\boxed{1}\begin{bmatrix} \text{SYN} \begin{bmatrix} \text{VAL} \begin{bmatrix} \text{COMPS} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

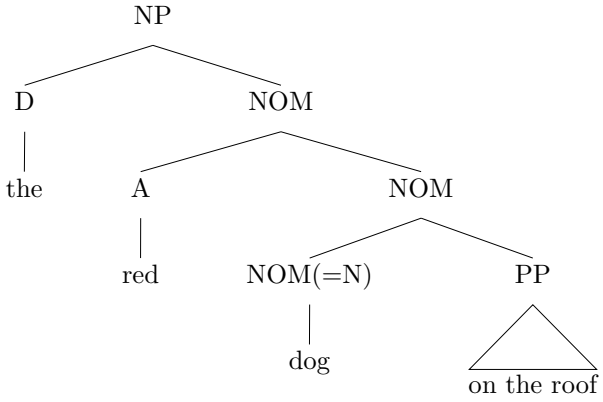
C. Yes, POST-HEAD is a HEAD feature. The top node of a modifier phrase must have a value of POST-HEAD on it, to permit one of the two Head-Modifier Rules to combine it with a phrase it modifies. Some lexical items have POST-HEAD values in their entries, because the modifier phrases they head can only appear after the phrase they modify. For example, modifier prepositional phrases (such as *on the roof* in (i) in this problem) appear after the phrases they modify. Hence, prepositions are lexically marked [POST-HEAD +]. In order for this marking to get up to the PP node, where it will determine which Head-Modifier rule applies, POST-HEAD has to be a HEAD feature.

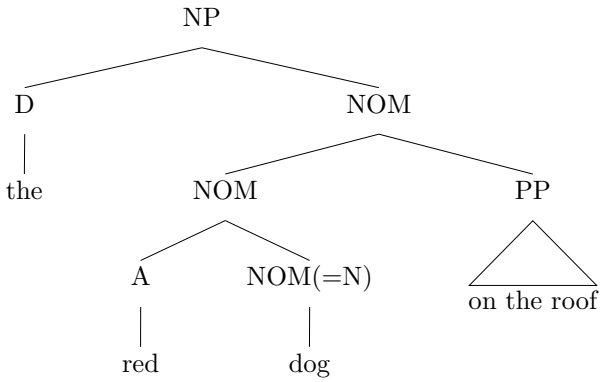
D.
$$\left\langle \text{red} , \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \textit{adj} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle\ \rangle \\ \text{COMPS} & \langle\ (\text{PP})\ \rangle \\ \text{MOD} & \left\langle \text{NOM} \right\rangle \end{bmatrix} \end{bmatrix} \end{bmatrix} \right\rangle$$

Note: We have underspecified this entry for the feature POST-HEAD, because sentences like the following seem acceptable to us: *A napkin red with wine lay next to the broken bottle.* If we wanted to exclude such sentences (or to handle them with some other mechanism), we could specify in the entry for *red* that it is [POST-HEAD −]. One might also argue with the claim that *with wine* is a complement, rather than a modifier, of *red*, so the optional PP in the COMPS list could be omitted.

$$\left\langle \text{on} , \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{prep} \\ \text{POST-HEAD} & + \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle\ \rangle \\ \text{COMPS} & \langle\ \text{NP}\ \rangle \\ \text{MOD} & \langle\ \text{VP} \mid \text{NOM}\ \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix} \right\rangle$$

E. Both *red* and *on the roof* combine with a NOM to form another NOM. That means that either one can combine before or after the other one, yielding two different tree geometries[1]:





F. Certain adjectives sound better after nouns than others. Also, adding a complement to an adjective makes it sound much better in post-head position. Here are some examples that sound fairly good, with the NPs containing the post-head modifiers in boldface.

The teacher alone knows the answer to this question.
Anyone fond of car chase scenes will love this movie.
A mug full of beer sat on the table.

G. Many adverbs can appear in multiple positions. So the answers to this part and the next may overlap.

Pat apparently left.
We certainly tried to help.
They rarely responded.
We repeatedly tried to help.
They grudgingly responsed.

H. Pat left angrily.
They responded rarely.
We tried repeatedly to help.
They responded grudgingly.

[1]The nodes in these diagrams that we have labeled "NOM(=N)" satisfy the definitions of both NOM and N. That is, their HEAD is of type *noun*, they are of type *word*, and they have an empty COMPS list and a nonempty SPR list.

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