Chapter 13, Problem 4: Negation and Inversion

A. Our analyses of negation and inversion will license (i) (*Has Pat not been sleeping?*) but not (ii) (*Has not Pat been sleeping?*). For sentence (i), *has* would have to have the ARG-ST shown in (i′):

(i′) ⟨ NP , ADV_{pol} , VP[FORM psp] ⟩

For sentence (ii), it would have to have the ARG-ST shown in (ii′):

(i′) ⟨ ADV_{pol} , NP , VP[FORM psp] ⟩

B. It is our judgement that this prediction of our grammar is correct – that is, that (i) is acceptable but (ii) is not. There are older varieties of English, however, that include sentences like (ii), and some current speakers still judge these to be acceptable.

C. The ARG-ST for the word *has* (OUTPUT of the 3rd-Singular Verb LR) is the following:

$$\begin{bmatrix} \text{ARG-ST} & \left\langle \boxed{1}\text{NP}[\textit{3sing},\text{nom}] \,,\, \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} \\ \text{FORM} \quad \text{psp} \end{bmatrix} \\ \text{SPR} & \langle \boxed{1} \rangle \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & \boxed{4} \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix}$$

When *has* is the INPUT, the OUTPUT of the ADV_{pol}-Addition LR has this ARG-ST:

$$\begin{bmatrix} & & \text{ADV}_{pol} & \\ & \boxed{1}\text{NP}[\textit{3sing},\text{nom}] \,, & \begin{bmatrix} \text{HEAD} & \textit{adv} \\ \text{INDEX} & \boxed{3} \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \text{not} \\ \text{ARG} & s \end{bmatrix} \right\rangle \end{bmatrix}, & \\ \text{ARG-ST} & \left\langle \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} \\ \text{FORM} \quad \text{psp} \end{bmatrix} \\ \text{SPR} & \langle \boxed{1} \rangle \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & \boxed{4} \end{bmatrix} \end{bmatrix} \right\rangle & \end{bmatrix}$$

The Inversion LR does not affect the ARG-ST list, and the order of the ARG-ST elements is preserved by both the ARP and the Head Complement Rule. Therefore, in any sentence involving word structures licensed by such lexical sequences, the NP will precede the ADV_{pol}. Therefore, (ii) will not be licensed by our grammar.

There is no straightforward modification of our rules that would allow both (i) and (ii). A special inverted negation lexical rule could be added that would apply only to [INV +] auxiliaries and would insert *not* as the initial element in the ARG-ST list. Alternatively, the new LR could treat the insertion of *not* as a morphological operation, changing only the value of POL and the semantics of the *synsem*.

D. The ARG-ST of *has* in (ii) is the following (repeated from Part (C) above):

$$\left[\text{ARG-ST}\ \left\langle \boxed{1}\text{NP}[\textit{3sing},\text{nom}]\ ,\ \begin{bmatrix}\text{HEAD} & \textit{adv}\\ \text{INDEX} & \boxed{3}\\ \text{RESTR} & \left\langle\begin{bmatrix}\text{RELN} & \text{not}\\ \text{ARG} & s\end{bmatrix}\right\rangle\end{bmatrix}_{\text{ADV}_{pol}},\ \left[\begin{bmatrix}\text{SYN} & \begin{bmatrix}\text{HEAD} & \begin{bmatrix}\textit{verb}\\ \text{FORM} & \text{psp}\end{bmatrix}\\ \text{SPR} & \langle\boxed{1}\rangle\end{bmatrix}\\ \text{SEM} & \left[\text{INDEX}\ \boxed{4}\right]\end{bmatrix}\right]\right\rangle\right]$$

The Inversion LR does not affect the ARG-ST. Rather, it constrains the SPR of its OUTPUT to be empty. By the ARP, all of the elements on the ARG-ST list must be on the COMPS list, preserving the order. Therefore, all three arguments (NP, ADV_{pol}, VP) are realized after *has* in that order by the Head Complement Rule.

E. Sentence (iii) is licensed by our grammar, as the Contraction Lexical Rule is a morphological rule: rather than adding something to the ARG-ST, it changes the morphological form of the word. When *has* is the input, the output of the Contraction LR looks like this:

$$\left\langle \text{has}\ ,\ \left[\begin{bmatrix}\textit{word}\\ \text{SYN} & \begin{bmatrix}\text{HEAD} & \begin{bmatrix}\textit{verb}\\ \text{FORM} & \text{fin}\\ \text{AUX} & +\\ \text{POL} & +\\ \text{INV} & -\end{bmatrix}\\ \text{SPR} & \langle\ \text{XP}\ \rangle\end{bmatrix}\\ \text{ARG-ST} & \left\langle \boxed{1}\text{NP}[\textit{3sing},\text{nom}]\ ,\ \left[\begin{bmatrix}\text{SYN} & \begin{bmatrix}\text{HEAD} & \begin{bmatrix}\textit{verb}\\ \text{FORM} & \text{psp}\end{bmatrix}\\ \text{SPR} & \langle\boxed{1}\rangle\end{bmatrix}\\ \text{SEM} & \left[\text{INDEX}\ \boxed{4}\right]\end{bmatrix}\right]\right\rangle\\ \text{SEM} & \begin{bmatrix}\text{MODE} & \text{prop}\\ \text{INDEX} & t\\ \text{RESTR} & \left\langle\begin{bmatrix}\text{RELN} & \text{not}\\ \text{SIT} & t\\ \text{ARG} & \boxed{5}\end{bmatrix},\begin{bmatrix}\text{RELN} & \text{have}\\ \text{SIT} & \boxed{5}\\ \text{ARG} & \boxed{4}\end{bmatrix}\right\rangle\end{bmatrix}\end{bmatrix}\right]\right\rangle$$

As before, one of the effects of the Inversion LR is to make the SPR list empty, causing the ARP to realize all of the arguments on the COMPS list. This time, however, there is no ADV_{pol} argument, so we get *Hasn't Pat been sleeping?* and not *Has Pat n't been sleeping?*.