Grammar 4

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What's wrong with Grammar 3

Grammar 3 allows verbs to appear in two places:

1) As the single verb in a sentence:

$$\begin{bmatrix} \textit{phrase} \\ \text{SYNTAX} \quad \textit{sentence} \end{bmatrix} \rightarrow \begin{bmatrix} \textit{word} \\ \text{SYNTAX} \quad \textit{noun} \end{bmatrix} \begin{bmatrix} \textit{word} \\ \text{SYNTAX} \quad \textit{verb} \end{bmatrix}$$

2) As the verb in a verb phrase of the form V + N:

$$\begin{bmatrix} \textit{phrase} \\ \text{SYNTAX} \quad \textit{verb} \end{bmatrix} \rightarrow \begin{bmatrix} \textit{word} \\ \text{SYNTAX} \quad \textit{verb} \end{bmatrix} \begin{bmatrix} \textit{word} \\ \text{SYNTAX} \quad \textit{noun} \end{bmatrix}$$

What's wrong with Grammar 3, 2

This predicts that every verb can appear in both of these places. But, this prediction is clearly *false*:

(1) a. Kim smokes.
b. * Kim smokes Robin.

(2) a. * Kim likes.
b. Kim likes Robin.

Solution:

- The lexical entries for verb words need to specify whether the verb is transitive or intransitive.
- All rules that introduce a verb word need to specify whether that verb is transitive or intransitive.

The new lexicon

$$\begin{bmatrix} \textit{word} & \\ \text{PHONOLOGY} & \langle \textit{kim} \rangle \\ \text{SYNTAX} & \textit{noun} \\ \text{SEMANTICS} & \textit{person} \end{bmatrix}$$

$$\begin{bmatrix} \textit{word} & \\ \text{PHONOLOGY} & \langle \textit{robin} \rangle \\ \text{SYNTAX} & \textit{noun} \\ \text{SEMANTICS} & \textit{person} \end{bmatrix}$$

$$\begin{bmatrix} \textit{word} & \\ \text{PHONOLOGY} & \langle \textit{smokes} \rangle \\ \text{SYNTAX} & \begin{bmatrix} \textit{verb} \\ \text{TRANSITIVE} - \end{bmatrix} \\ \text{SEMANTICS} & \textit{event} \end{bmatrix}$$

$$\begin{bmatrix} \textit{word} & \\ \text{PHONOLOGY} & \langle \textit{likes} \rangle \\ \text{SYNTAX} & \begin{bmatrix} \textit{verb} \\ \text{TRANSITIVE} + \end{bmatrix} \\ \text{SEMANTICS} & \textit{event} \end{bmatrix}$$

The new phrase structure rules

For sentences:

$$\begin{bmatrix} \textit{phrase} \\ \text{SYNTAX} \quad \textit{sentence} \end{bmatrix} \rightarrow \begin{bmatrix} \textit{word} \\ \text{SYNTAX} \quad \textit{noun} \end{bmatrix} \begin{bmatrix} \textit{word} \\ \text{SYNTAX} \quad \begin{bmatrix} \textit{verb} \\ \text{TRANSITIVE} \; - \end{bmatrix} \end{bmatrix}$$

$$\begin{bmatrix} \textit{phrase} \\ \text{SYNTAX} \quad \textit{sentence} \end{bmatrix} \rightarrow \begin{bmatrix} \textit{word} \\ \text{SYNTAX} \quad \textit{noun} \end{bmatrix} \begin{bmatrix} \textit{phrase} \\ \text{SYNTAX} \quad \textit{verb} \end{bmatrix}$$

For verb phrases:

$$\begin{bmatrix} \textit{phrase} \\ \text{SYNTAX} \quad \textit{verb} \end{bmatrix} \rightarrow \begin{bmatrix} \textit{word} \\ \text{SYNTAX} \quad \begin{bmatrix} \textit{verb} \\ \text{TRANSITIVE} \; + \end{bmatrix} \end{bmatrix} \begin{bmatrix} \textit{word} \\ \text{SYNTAX} \quad \textit{noun} \end{bmatrix}$$

Excercises

1. Parse all the test items of Grammar 4!
2. Explain why Grammar 4 now makes the correct predictions for test items (16) and (17)!
3. Assume that all the lexical entries for test items (18) and (19) are added to the lexicon of Grammar 4.
4. Parse those test items!
5. Why is Grammar 4 not able to parse (18) and (19)?
6. How can we solve this problem?