

Grammar 5

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What's wrong with Grammar 4

- Grammar 4 makes a distinction between transitive and intransitive verbs, both in lexical entries and in phrase structure rules.
- Intransitive verbs (*smoke*) need nothing to their right.
- Transitive verbs (*like*) need a noun to their right.

But, there are verbs that need categories other than *noun* to their right:

- Kim is sad. (*adjective*)
- Kim lives there. (*preposition*)

Conclusion: the distinction between transitive and intransitive verbs is not enough. We need to be able to distinguish between more types of verbs!

Question: what do we replace the transitive-intransitive distinction with?

Question

Let us begin by asking what *transitive verb* means?

$$\left[\begin{array}{l} \textit{phrase} \\ \text{SYNTAX} \quad \textit{verb} \end{array} \right] \rightarrow \left[\begin{array}{l} \textit{word} \\ \text{SYNTAX} \quad \left[\begin{array}{l} \textit{verb} \\ \text{TRANSITIVE +} \end{array} \right] \end{array} \right] \left[\begin{array}{l} \textit{word} \\ \text{SYNTAX} \quad \textit{noun} \end{array} \right]$$

Answer: *Transitive verb* means *Verb that needs a noun to its right*.

The new system should be able to cover all of the following verbs

Verb	needs to its right
<i>smoke</i>	—
<i>like</i>	<i>noun</i>
<i>is</i>	<i>adjective</i>
<i>lives</i>	<i>preposition</i>

In order to realize this, we change the grammar as follows:

- We replace the feature TRANSITIVE by a new feature: I_NEED_ON_THE_RIGHT.
- The value of this feature is a list that is either empty (for intransitive verbs) or a list that contains exactly one part of speech (*noun*, *adjective*, *preposition*).

The new lexicon, 1

<i>word</i>	
PHONOLOGY	$\langle \text{smokes} \rangle$
SYNTAX	$\left[\begin{array}{l} \text{verb} \\ \text{I_NEED_ON_THE_RIGHT} \langle \rangle \end{array} \right]$
SEMANTICS	<i>event</i>

<i>word</i>	
PHONOLOGY	$\langle \text{likes} \rangle$
SYNTAX	$\left[\begin{array}{l} \text{verb} \\ \text{I_NEED_ON_THE_RIGHT} \langle \text{noun} \rangle \end{array} \right]$
SEMANTICS	<i>event</i>

The new lexicon, 2

<i>word</i>	
PHONOLOGY	$\langle is \rangle$
SYNTAX	<div><i>verb</i> <i>I_NEED_ON_THE_RIGHT</i> $\langle adjective \rangle$</div>
SEMANTICS	<i>event</i>

<i>word</i>			
PHONOLOGY	$\langle lives \rangle$		
SYNTAX	<table><tr><td><i>verb</i></td></tr><tr><td>I_NEED_ON_THE_RIGHT $\langle preposition \rangle$</td></tr></table>	<i>verb</i>	I_NEED_ON_THE_RIGHT $\langle preposition \rangle$
<i>verb</i>			
I_NEED_ON_THE_RIGHT $\langle preposition \rangle$			
SEMANTICS	<i>event</i>		

Of course, the phrase structure rules need to be changed along with the lexical entries

For sentences:

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

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

For verb phrases:

$$\begin{bmatrix} \textit{phrase} \\ \text{SYNTAX} \quad \textit{verb} \end{bmatrix} \rightarrow \begin{bmatrix} \textit{word} \\ \text{SYNTAX} \quad \begin{bmatrix} \textit{verb} \\ \text{RIGHT} \langle \boxed{1} \rangle \end{bmatrix} \end{bmatrix} \begin{bmatrix} \textit{word} \\ \text{SYNTAX} \quad \boxed{1} \end{bmatrix}$$

The last rule says: a verb phrase consists of a verb word that wants the category C after it + a word of that same category C.

Exercises

- 1 Parse test items (10)-(19) of Grammar 5!
- 2 Explain how Grammar 5 ensures that every verb word has exactly the right kind of element on its right.