

# Grammar 17

Gert Webelhuth

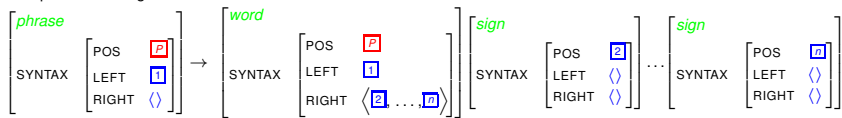
University of Frankfurt

# The grammar so far

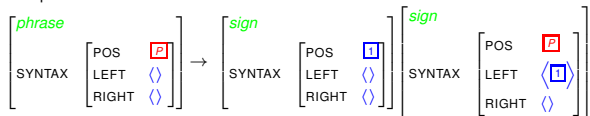
There are only two grammar rules:

The rules appear in the order in which they apply, from the bottom of the tree to the top.

Complete-on-the-right-rule:



Complete-on-the-left-rule:



# Lexical entries for typical nouns

<i>word</i>																	
PHONOLOGY	⟨student⟩																
SYNTAX	<table><tr><td>POS</td><td><table><tr><td><i>noun</i></td></tr><tr><td>CASE</td><td><i>nominative</i></td></tr><tr><td>NOUN AGREEMENT</td><td><table><tr><td>1</td></tr></table><i>third-singular</i></td></tr></table></td></tr><tr><td>LEFT</td><td>⟨<table><tr><td><i>determiner</i></td></tr><tr><td>DETERMINER AGREEMENT</td><td><table><tr><td>1</td></tr></table></td></tr></table>⟩</td></tr><tr><td>RIGHT</td><td>⟨⟩</td></tr></table>	POS	<table><tr><td><i>noun</i></td></tr><tr><td>CASE</td><td><i>nominative</i></td></tr><tr><td>NOUN AGREEMENT</td><td><table><tr><td>1</td></tr></table><i>third-singular</i></td></tr></table>	<i>noun</i>	CASE	<i>nominative</i>	NOUN AGREEMENT	<table><tr><td>1</td></tr></table> <i>third-singular</i>	1	LEFT	⟨ <table><tr><td><i>determiner</i></td></tr><tr><td>DETERMINER AGREEMENT</td><td><table><tr><td>1</td></tr></table></td></tr></table> ⟩	<i>determiner</i>	DETERMINER AGREEMENT	<table><tr><td>1</td></tr></table>	1	RIGHT	⟨⟩
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DETERMINER AGREEMENT	<table><tr><td>1</td></tr></table>	1															
1																	
RIGHT	⟨⟩																

# Lexical entries for typical determiners

<i>word</i>									
PHONOLOGY	$\langle a \rangle$								
SYNTAX	<table><tr><td>POS</td><td><i>determiner</i></td></tr><tr><td></td><td>DETERMINER AGREEMENT <i>third-singular</i></td></tr><tr><td>LEFT</td><td><math>\langle \rangle</math></td></tr><tr><td>RIGHT</td><td><math>\langle \rangle</math></td></tr></table>	POS	<i>determiner</i>		DETERMINER AGREEMENT <i>third-singular</i>	LEFT	$\langle \rangle$	RIGHT	$\langle \rangle$
POS	<i>determiner</i>								
	DETERMINER AGREEMENT <i>third-singular</i>								
LEFT	$\langle \rangle$								
RIGHT	$\langle \rangle$								

<i>word</i>									
PHONOLOGY	$\langle those \rangle$								
SYNTAX	<table><tr><td>POS</td><td><i>determiner</i></td></tr><tr><td></td><td>DETERMINER AGREEMENT <i>third-plural</i></td></tr><tr><td>LEFT</td><td><math>\langle \rangle</math></td></tr><tr><td>RIGHT</td><td><math>\langle \rangle</math></td></tr></table>	POS	<i>determiner</i>		DETERMINER AGREEMENT <i>third-plural</i>	LEFT	$\langle \rangle$	RIGHT	$\langle \rangle$
POS	<i>determiner</i>								
	DETERMINER AGREEMENT <i>third-plural</i>								
LEFT	$\langle \rangle$								
RIGHT	$\langle \rangle$								

# Lexical entries for typical verbs

<i>word</i>	
PHONOLOGY	⟨smoke⟩
SYNTAX	<div> <div>POS</div> <div> <i>verb</i>  VERB AGREEMENT <span>1</span><i>first-singular</i>  VERB FORM <i>finite</i> </div> </div>
	<div> <div>LEFT</div> <div> <div> <i>noun</i>  CASE  NOUN AGREEMENT <span>1</span> </div> <div><i>nominative</i></div> </div> </div>
	RIGHT ⟨⟩

<i>word</i>	
PHONOLOGY	⟨smokes⟩
SYNTAX	<div> <div>POS</div> <div> <i>verb</i>  VERB AGREEMENT <span>1</span><i>third-singular</i>  VERB FORM <i>finite</i> </div> </div>
	<div> <div>LEFT</div> <div> <div> <i>noun</i>  CASE  NOUN AGREEMENT <span>1</span> </div> <div><i>nominative</i></div> </div> </div>
	RIGHT ⟨⟩

# Lexical entries for typical auxiliaries

<i>word</i>	
PHONOLOGY	⟨am⟩
SYNTAX	<div> <div>POS</div> <div> <i>verb</i>  VERB AGREEMENT <span>1</span> <i>first-singular</i>  VERB FORM <i>finite</i> </div> </div>
	<div> <div>LEFT</div> <div> <div> <i>noun</i>  CASE <i>nominative</i>  NOUN AGREEMENT <span>1</span> </div> </div> </div>
	<div> <div>RIGHT</div> <div> <div> <i>verb</i>  VERB FORM <i>progressive</i> </div> </div> </div>

<i>word</i>	
PHONOLOGY	⟨been⟩
SYNTAX	<div> <div>POS</div> <div> <i>verb</i>  VERB FORM <i>perfect</i> </div> </div>
	<div> <div>LEFT</div> <div>⟨⟩</div> </div>
	<div> <div>RIGHT</div> <div> <div> <i>verb</i>  VERB FORM <i>progressive</i> </div> </div> </div>

## The auxiliary *do* selects a VP with a bare verb form

- (1) a. robin does eat an apple  
b. \* robin does eats an apple  
c. \* robin does ate an apple  
d. \* robin does eaten an apple  
e. \* robin does eating an apple

## The auxiliary *do* has an interesting restriction that the other auxiliaries don't have

Certain verbs cannot appear after *do*, even though they have a **bare** verb form:

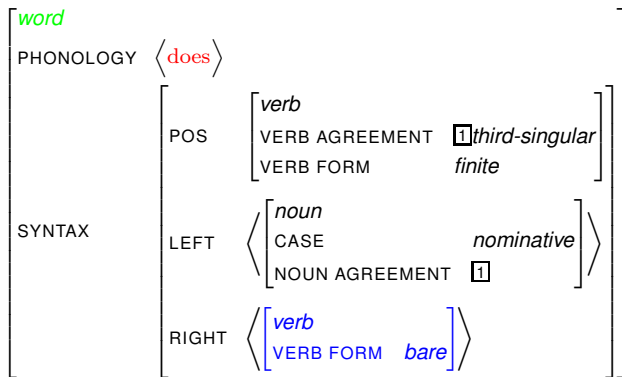
- (2) a. \* robin does **be** sad  
b. \* robin does **be** eating an apple  
c. \* robin does **have** eaten an apple

What the **banned** verbs have in common, is that they are **auxiliaries**.

👉 So: *do* only allows **main verbs** after it!

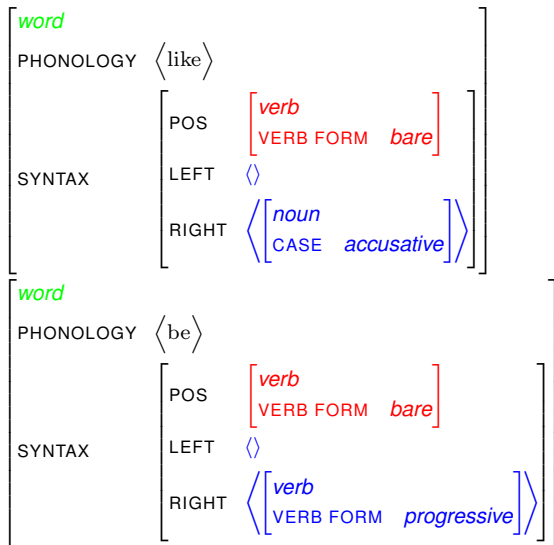


## Problem: how to we capture this behavior in the lexical entry of *do*?



As can be seen on the following slide, our grammar does not distinguish between main verbs and auxiliaries.

# No distinction between main verbs and auxiliaries



# Where should the distinction be encoded?

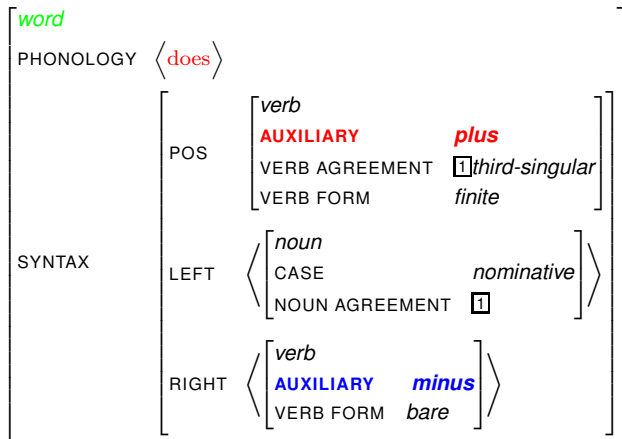
Answer: of course in the same place where we have encoded the other properties that are only relevant for verbs, namely in the **part-of-speech** value.

<i>word</i>	
PHONOLOGY	⟨like⟩
SYNTAX	<div><div>POS</div><div><i>verb</i> <b>AUXILIARY</b>    <i>minus</i> VERB FORM    <i>bare</i></div></div>
	LEFT    ⟨⟩
	RIGHT    ⟨ <div><div><i>noun</i> CASE    <i>accusative</i></div></div> ⟩

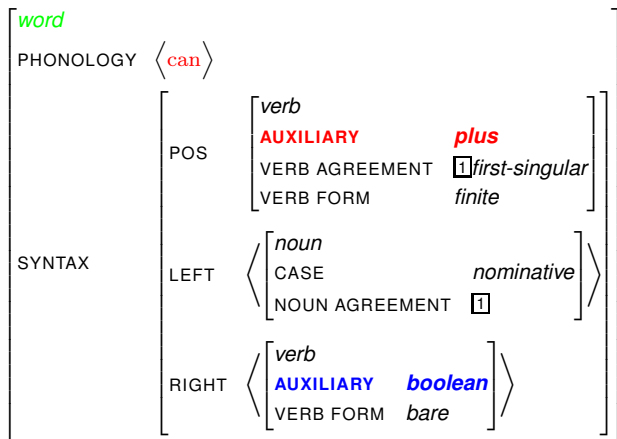
<i>word</i>	
PHONOLOGY	⟨be⟩
SYNTAX	<div><div>POS</div><div><i>verb</i> <b>AUXILIARY</b>    <i>plus</i> VERB FORM    <i>bare</i></div></div>
	LEFT    ⟨⟩
	RIGHT    ⟨ <div><div><i>verb</i> VERB FORM    <i>progressive</i></div></div> ⟩

# *do* only permits main verbs after it

Now, it is easy to encode in the lexical entry of the auxiliary *do* that it only permits main verbs after it:



# *can* permits both main verbs and auxiliaries after it



The type *boolean* is neutral between the two types *plus* and *minus* in the same way that the type *sign* is neutral between the two types *word* and *phrase*.

# Excercises

- 1 Parse the words “be”, “been”, “must” and “have” and look at the part of speech value of the output!
- 2 Parse the words “smokes”, “liked”, and “shown” and look at the part of speech value of the output!
- 3 Parse test items (223)-(230) and explain why you get the results you get!