

# Modeling Syntactic Relations, p. 1

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There are different types of syntactic relations. Syntactic theory models these relations in various ways. Consider (1).

- (1) The dinosaurs will watch a movie about some verbs after this class.

## Constituent Structure

A sentence is made up of words combined in larger and larger pieces of structure. Each of these pieces belongs to a syntactic category. The sentence in (1) is made of the words in (2).

- (2) *the, a, some, this* (belonging to the category “determiner”, conventionally represented as D)  
*dinosaurs, movie, verbs, class* (belonging to the category “noun”, conventionally represented as N)  
*will* (belonging to the category “auxiliary” or “infl”, conventionally represented as I)  
*watch* (belonging to category “verb”, conventionally represented as V)  
*about, after* (belonging to category “preposition” (more correctly “adposition”), conventionally represented as P)

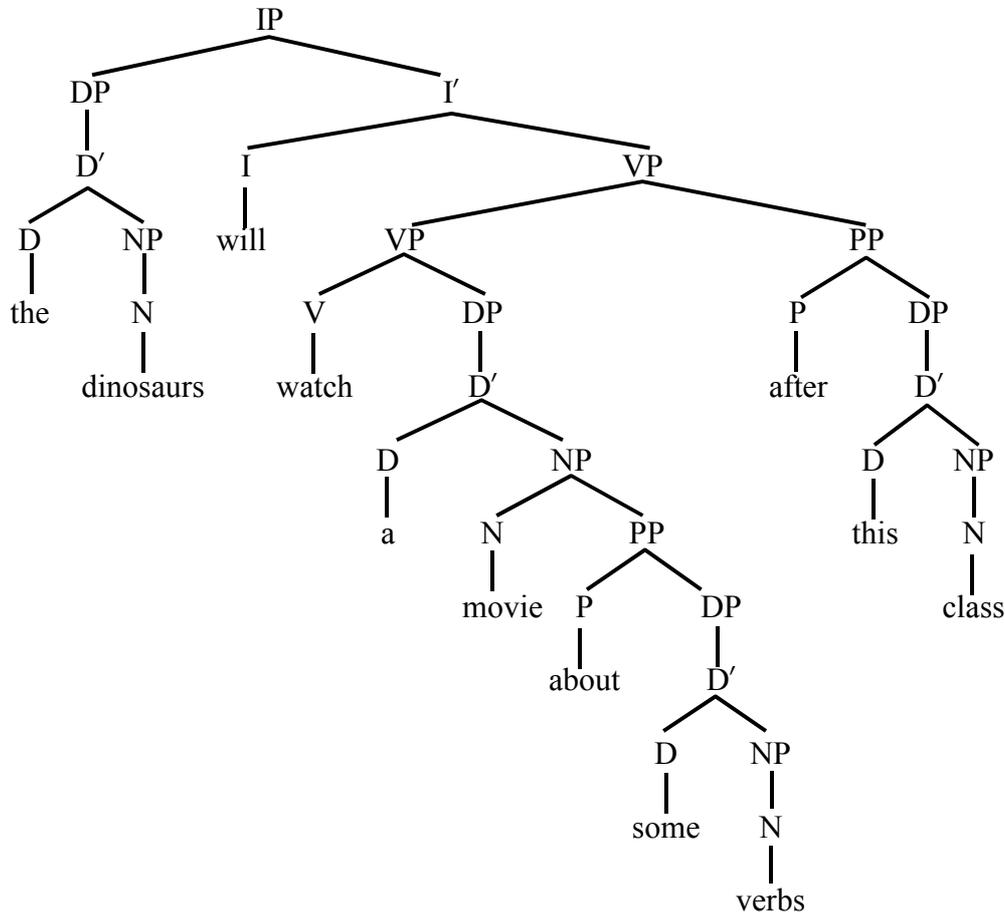
Assuming the categories of  $\bar{X}$  theory and the DP hypothesis (but omitting  $N'$ ,  $V'$ , and  $P'$ ), these words are combined as follows:

- (3) a. Some of the nouns have phrasal status by themselves (i.e. they are NPs in addition to being Ns):  
*dinosaurs, verbs, class,*  
 b. The D *the* and the NP *dinosaurs* combine to form a  $D'$  *the dinosaurs*  
 c. The  $D'$  *the dinosaurs* is also a DP.  
 d. The D *some* and the NP *verbs* combine to form a  $D'$  *some verbs*.  
 e. The  $D'$  *some verbs* is also a DP.  
 f. The P *about* and the DP *some verbs* combine to form a PP.  
 g. The N *movie* and the P *about some verbs* combine to form the NP *movie about some verbs*.  
 h. The D *a* and the NP *movie about some verbs* combine to form a  $D'$  *a movie about some verbs*.  
 i. The  $D'$  *a movie about some verbs* is also a DP.  
 j. The D *this* and the NP *class* combine to form a  $D'$  *this class*.  
 k. The  $D'$  *this class* is also a DP.  
 l. The P *after* and the DP *this class* combine to form a PP.  
 m. The V *watch* combines with the DP *a movie* to form the VP *watch a movie*.  
 n. The VP *watch a movie* and the PP *after this class* combine to form a larger VP *watch a movie after this class*.  
 o. The I *will* combines with the VP *watch a movie after this class* to form the  $I'$  *will watch a movie after this class*.  
 p. The DP *the dinosaurs* combines with the  $I'$  *will watch a movie after this class* to form the IP *The dinosaurs will watch a movie after this class*.

Traditional tests for constituency confirm the status of each of these as a piece of structure. This kind of syntactic relation is traditionally modeled through the use of a **constituent structure** tree or the completely equivalent **labeled bracketing** notation.

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(4) a.



b.  $[_{DP}[_{D'}[_{D} \text{The}] [_{NP}[_{N} \text{dinosaurs}]]]] [_{I'}[_{I} \text{will}] [_{VP}[_{VP}[_{V} \text{watch}] [_{DP}[_{D'}[_{D} \text{a}] [_{NP}[_{N} \text{movie}]] [_{PP}[_{P} \text{about}] [_{DP}[_{D'}[_{D} \text{some}] [_{NP}[_{N} \text{verbs}]]]]]]]]]]]] [_{PP}[_{P} \text{after}] [_{DP}[_{D'}[_{D} \text{this}] [_{NP}[_{N} \text{class}]]]]]]]]]]$

Other notations have also been used.

## Grammatical Functions

A sentence is made up of functional units. These units are related to each other by what function they serve. (These are sometimes referred to as relations of dependency.) In our sample sentence:

- (5) a. The functionally central element is 'watch', which selects two obligatory dependents: one bearing the function "subject" (which we will write SUBJ) and one bearing the function "object" (OBJ).
- b. The sentence is in the future tense. (This is expressed by the word *will*.)
- c. The functional element 'dinosaur' is definite (expressed by the D *the*) and plural (due to the morphological structure of the word *dinosaurs*). It functions as the SUBJ of 'watch'.
- d. The functional element 'movie' is indefinite and singular (expressed by the D *a* and the morphological structure of the word *movie*). It selects an "oblique" argument expressing the "about" relation ( $OBL_{\text{about}}$ )—more precisely, the OBJ within an element functioning as  $OBL_{\text{about}}$ .
- e. The functional element 'verb' is indefinite (expressed by the D *some*) and plural (expressed by the morphological structure of the word *verbs*). It is the OBJ within the  $OBL_{\text{about}}$ . The  $OBL_{\text{about}}$

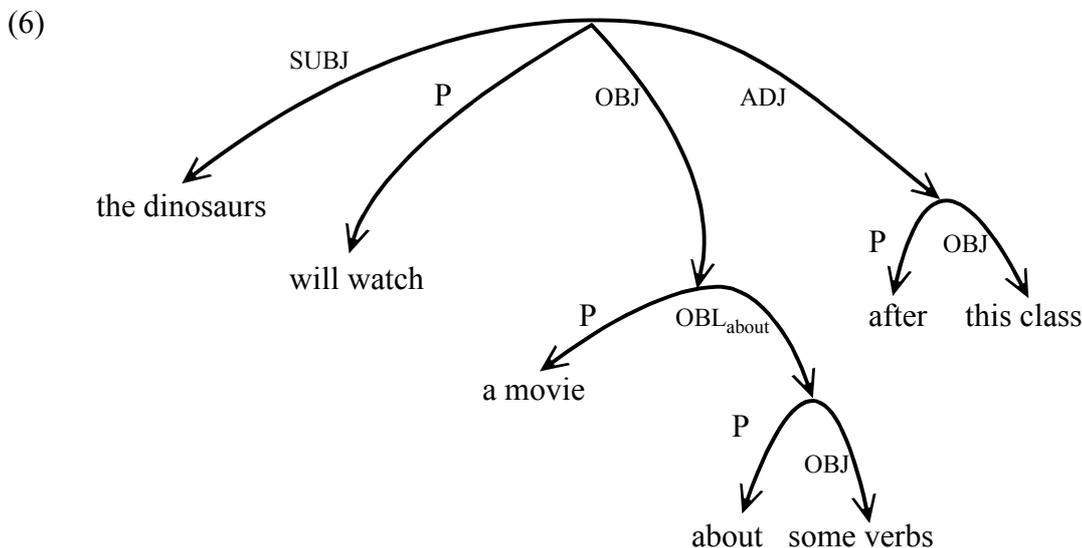
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argument includes an element (the preposition *about*) functioning to express the type (or “Case”) of the oblique argument.

- f. The functional element ‘after’ functions as an “adjunct” (ADJ) to the sentence.
- g. ‘After’ selects a dependent with the function OBJ.
- f. The functional element ‘class’ is definite (due to the deictic element *this*) and singular. It functions as the OBJ of ‘after’.

Various notations have been devised to express these kinds of relations. One, from the theoretical framework Relational Grammar (RG), is called a **relational network**. It does not usually represent features like definiteness, number, and tense. (The notation here is slightly adapted from RG; for example, RG uses the names 1 and 2 instead of SUBJ and OBJ.)



Another notation, the one we will be using, comes from the formal notation of the theory of Lexical-Functional Grammar (LFG), and is called a **functional structure**, or **f-structure**.

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(7)

SUBJ	<table style="border-collapse: collapse;"> <tr><td style="padding-right: 10px;">DEF</td><td>+</td></tr> <tr><td style="padding-right: 10px;">PRED</td><td>'dinosaur'</td></tr> <tr><td style="padding-right: 10px;">NUM</td><td>SG</td></tr> </table>	DEF	+	PRED	'dinosaur'	NUM	SG												
DEF	+																		
PRED	'dinosaur'																		
NUM	SG																		
TENSE	FUTURE																		
PRED	'watch' $\langle (\uparrow \text{SUBJ})(\uparrow \text{OBJ}) \rangle$																		
OBJ	<table style="border-collapse: collapse;"> <tr><td style="padding-right: 10px;">DEF</td><td>–</td></tr> <tr><td style="padding-right: 10px;">PRED</td><td>'movie' <math>\langle (\uparrow \text{OBL}_{\text{about}} \text{OBJ}) \rangle</math></td></tr> <tr><td style="padding-right: 10px;">NUM</td><td>SG</td></tr> <tr> <td style="padding-right: 10px;">OBL<sub>about</sub></td> <td> <table style="border-collapse: collapse;"> <tr> <td style="padding-right: 10px;">CASE</td> <td>OBL<sub>about</sub></td> </tr> <tr> <td style="padding-right: 10px;">OBJ</td> <td> <table style="border-collapse: collapse;"> <tr><td style="padding-right: 10px;">DEF</td><td>–</td></tr> <tr><td style="padding-right: 10px;">PRED</td><td>'verb'</td></tr> <tr><td style="padding-right: 10px;">NUM</td><td>PL</td></tr> </table> </td> </tr> </table> </td> </tr> </table>	DEF	–	PRED	'movie' $\langle (\uparrow \text{OBL}_{\text{about}} \text{OBJ}) \rangle$	NUM	SG	OBL <sub>about</sub>	<table style="border-collapse: collapse;"> <tr> <td style="padding-right: 10px;">CASE</td> <td>OBL<sub>about</sub></td> </tr> <tr> <td style="padding-right: 10px;">OBJ</td> <td> <table style="border-collapse: collapse;"> <tr><td style="padding-right: 10px;">DEF</td><td>–</td></tr> <tr><td style="padding-right: 10px;">PRED</td><td>'verb'</td></tr> <tr><td style="padding-right: 10px;">NUM</td><td>PL</td></tr> </table> </td> </tr> </table>	CASE	OBL <sub>about</sub>	OBJ	<table style="border-collapse: collapse;"> <tr><td style="padding-right: 10px;">DEF</td><td>–</td></tr> <tr><td style="padding-right: 10px;">PRED</td><td>'verb'</td></tr> <tr><td style="padding-right: 10px;">NUM</td><td>PL</td></tr> </table>	DEF	–	PRED	'verb'	NUM	PL
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ADJ	<table style="border-collapse: collapse;"> <tr> <td style="padding-right: 10px;">PRED</td> <td>'about' <math>\langle (\uparrow \text{OBJ}) \rangle</math></td> </tr> <tr> <td style="padding-right: 10px;">OBJ</td> <td> <table style="border-collapse: collapse;"> <tr><td style="padding-right: 10px;">DEF</td><td>THIS</td></tr> <tr><td style="padding-right: 10px;">PRED</td><td>'class'</td></tr> <tr><td style="padding-right: 10px;">NUM</td><td>SG</td></tr> </table> </td> </tr> </table>	PRED	'about' $\langle (\uparrow \text{OBJ}) \rangle$	OBJ	<table style="border-collapse: collapse;"> <tr><td style="padding-right: 10px;">DEF</td><td>THIS</td></tr> <tr><td style="padding-right: 10px;">PRED</td><td>'class'</td></tr> <tr><td style="padding-right: 10px;">NUM</td><td>SG</td></tr> </table>	DEF	THIS	PRED	'class'	NUM	SG								
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## Parallel architecture

The foregoing has been based on the idea that structure and function are represented separately. Not all syntactic theories take this position: in standard transformational theory (including Government/Binding theory and the Minimalist Program) function is part of structure. This is an empirical claim—and, as we will be seeing this year, a problematic one.

Our approach is based on an architecture for syntax, and for language in general, which includes multiple parallel dimensions of linguistic elements. Under this approach, structure does not determine function and function does not determine structure. Instead, structure and function are mutually constraining, and yet independent of each other. This approach to language has been argued for extensively by Ray Jackendoff (2002) *Foundations of Language*. Oxford: Oxford University Press. It is the approach to syntax that typifies the theoretical framework of LFG.

In LFG, the relation between structure and function is constrained by universal principles, but not entirely determined by them. The correspondence between c-structure and f-structure is part of the grammar of the individual language.