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Syntax & Semantics WiSe 2020/2021

Lecture 13: Intermediate Summary II (Syntax)

22/12/2020, Christian Bentz

Overview

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Q&As

X-bar theory: Lecture

> *Regarding the rule $\overline{N} \rightarrow \overline{N}$ REL, shouldn't this be $\overline{N} \rightarrow N$ REL?*

While Müller (2019) does not give a detailed justification for this rule, I would argue that there are two reasons for having N-bar instead of just N here: a) We are able to deal with PPs intervening between the N and the relative clause, e.g. *the woman from Stuttgart who we know* (example from Müller 2019); b) we are able to deal with recursive structures like *Peter, who knows John, who knows Mary, who* ...

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X-bar theory: Exercise

How to deal with determiners?

In the lecture, I gave a simplified rule NP $\rightarrow$ DET $\overline{N}$. However, I also mentioned that strictly speaking you would have to have unary re-write rules, i.e. DP $\rightarrow$ $\overline{DET}$ $\rightarrow$ DET. Since I mentioned both, these are both valid alternatives.

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X-bar theory: Exercise

There seems to have been general confusion with the treatment of the relative pronoun in the relative clause. I have rewritten Exercise 1 to make the task clearer. The relative pronoun is now given its own POS (RPRO) such that there is a rewrite rule REL $\rightarrow$ RPRO VP. See solution on next slide.

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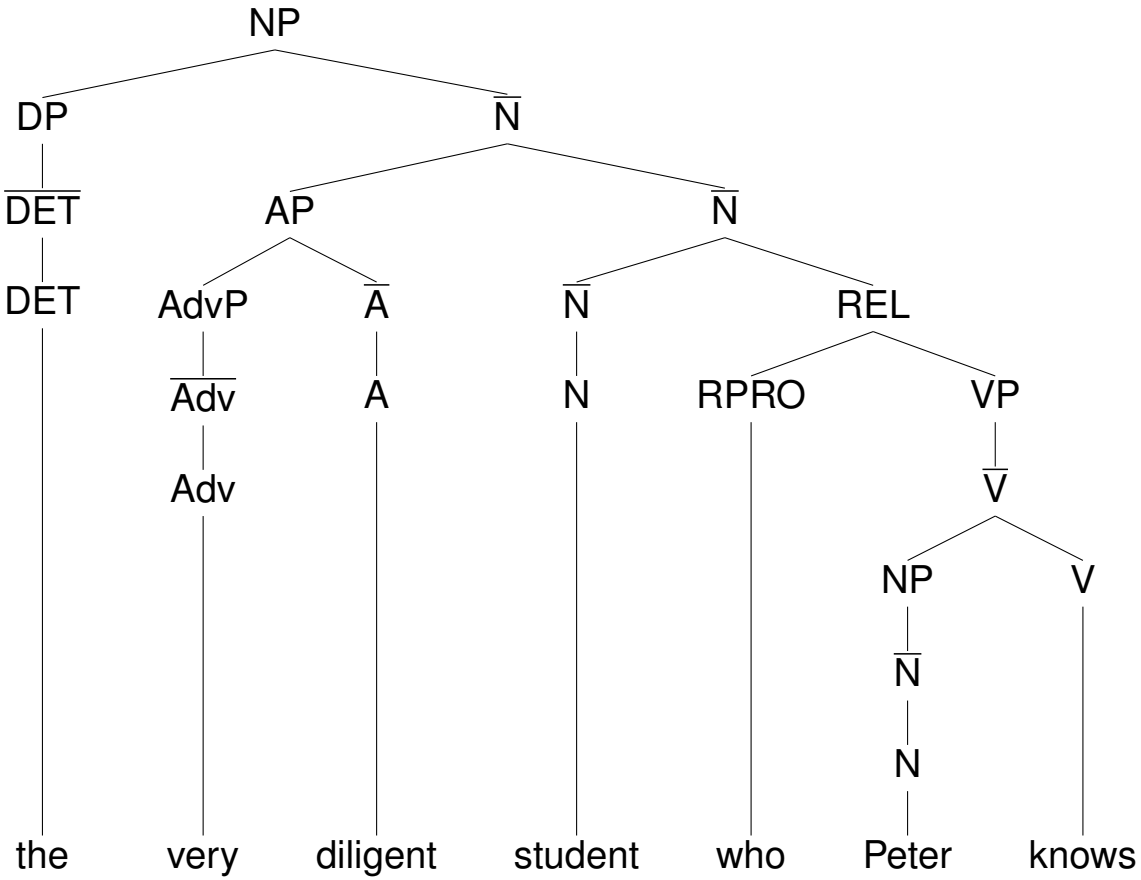

Note: Alternatively, we could first apply the $\overline{N} \rightarrow \overline{N}$ REL rewrite rule, and then the AP-rule.

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G&B: Lecture

> *Passive transformation: why isn't it possible to assume the passive structure and then transform it into an active structure? As users of a language we are able to derive the active sentence from the passive after all.*

This is a valid question. At least in the early versions of passive transformations (i.e. in Chomsky 1957), the active sentence is considered somewhat closer to deep structure (except for the potential inversion of the INFL category), and the passive is then derived from it. Maybe an argument can be made that arriving at different sentence structures from the active-like deep structure requires fewer steps than if you assumed the passive as a deep structure (compare the example sentences on the next slide).

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Examples

Peter -s beat the champion (deep structure)
Peter beats the champion (active)
Peter will beat the champion (active future tense)
Will Peter beat the champion? (active yes/no question
The champion is beaten (by Peter) (passive)

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G&B: Exercises

> *Why is the prepositional by-phrase considered an adjunct to the verb phrase? This wasn't given in the X-bar slides.*

Note that the set of rules given in the lecture on X-bar theory (just as any other set of rules given in this lecture series) is *not exhaustive*, in the sense that it would suffice to deal with *all* possible grammatical sentences of English. In fact, it isn't clear if such a set of rules even exists. So any set of rules is only a *grammar fragment* to deal with a particular set of sentences. Having said this, I would expect you to be able to expand the set of rules to deal with sentence structures not discussed before.

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G&B: Lecture

> *Referring to the passive transformation: when does case assignment take place, before or after movement?*

According to the Case Principle discussed in the lecture, the INFL (I) category (if finite) assigns nominative case to the subject. This principle seems independent of movement. Note that the I is always there in the tree structure, regardless of whether it is currently filled by a lexical item or a morpheme.

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Lecture 9: X-bar Theory

Why do we need bars in the first place?

The solution to capture all the noun phrases discussed above is a set of rewrite rules using the bar notation:[1]

1. NP $\rightarrow$ DET $\overline{\text{N}}$
2. $\overline{\text{N}}$ $\rightarrow$ A $\overline{\text{N}}$
3. $\overline{\text{N}}$ $\rightarrow$ N

"These rules state the following: a noun phrase consists of a determiner and a nominal element ($\overline{\text{N}}$). This nominal element can consist of an adjective and a nominal element, or just a noun. Since $\overline{\text{N}}$ is also on the right-hand side of the rule, we can apply this rule multiple times and therefore account for noun phrases with multiple adjectives [...]"

Müller (2019). Grammatical theory, p. 64.

[1] These rewrite rules also adhere to the binarization constraint but they wouldn't have to.

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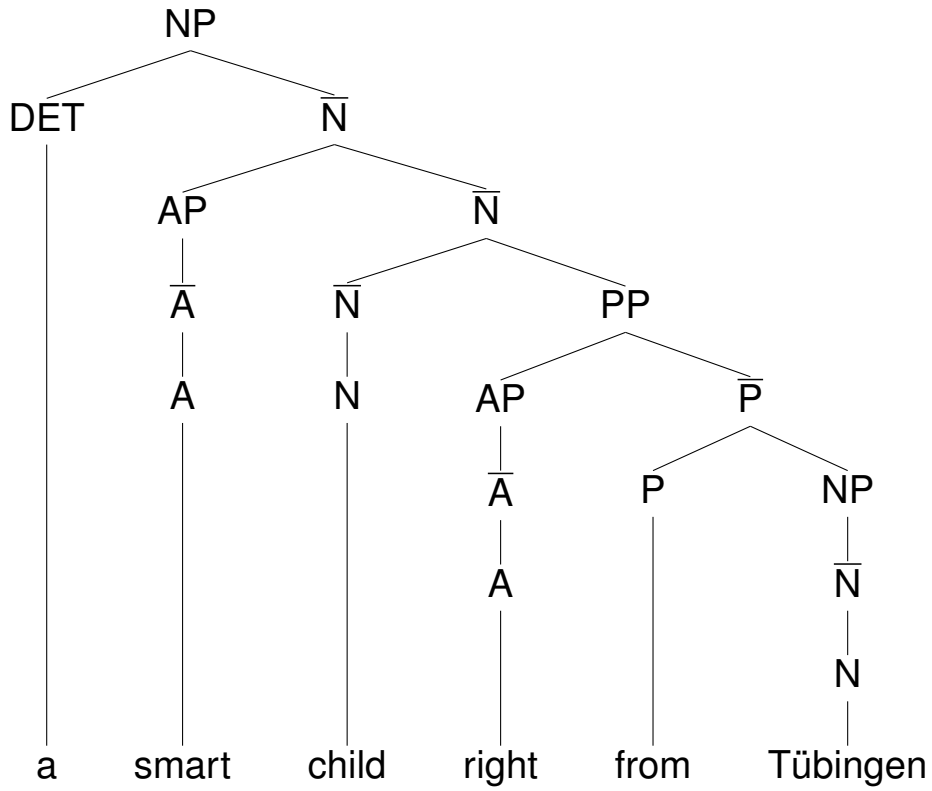
Full Example (Noun Phrase)



Rewrite Rules

1. NP → DET N̄
2. N̄ → AP N̄
3. N̄ → N
4. N̄ → N̄ PP
5. N̄ → N PP
6. N̄ → N̄ REL
8. PP → NP P̄
9. PP → AP P̄
10. PP → P̄
11. P̄ → P NP
12. AP → Ā
13. AP → AdvP Ā
14. Ā → A PP
15. Ā → A

Notes: The rule number two was modified (A → AP). Rule number seven is not included here as it was replaced by other rules of the X-bar notation.

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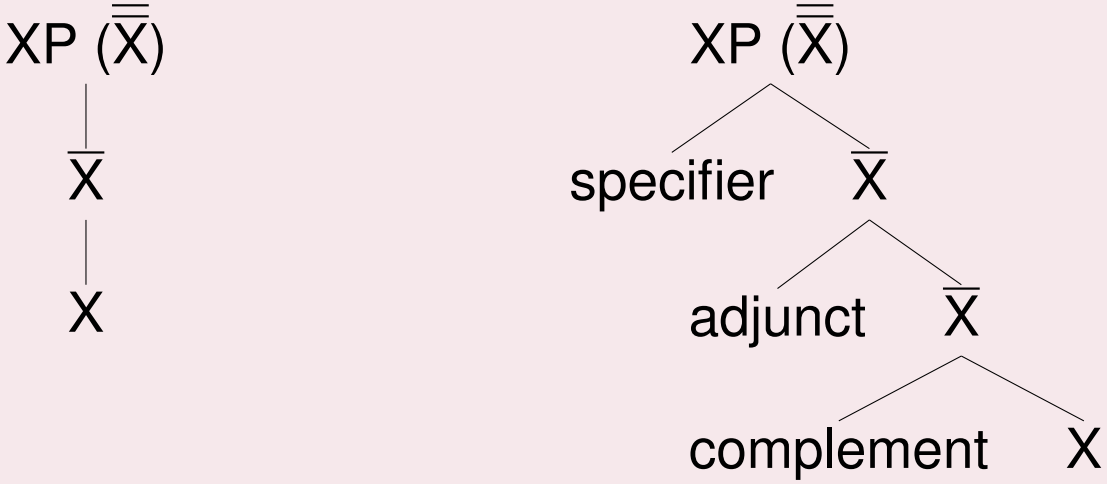
Maximal and Minimal $\overline{X}$ phrases

Given all the generalized $\overline{X}$ rules above we get to the **minimal** and **maximal phrase structure** possible within $\overline{X}$ theory:



Müller (2019). Grammatical theory, p. 76.

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Basic Concepts in X-bar Theory

- Constituency ✓
- POS ✓
- Heads ✓
- Valency ✓[2]
- Grammatical Functions(✓)[3]

[2]Valency now plays a more crucial role as in DG and PSG, since the X-bar scheme explicitely reflects the difference between arguments and adjuncts.

[3]Grammatical functions become more relevant, since the subject is mostly associated with the specifier position and the object(s) with the complement position(s).

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Comparison: PSG and X-bar Theory

- The bar notation allows the collapsing of formerly two non-terminal symbols in PSG into one non-terminal, e.g. NP $\rightarrow \overline{\text{N}}$ and N $\rightarrow \overline{\text{N}}$. This trick allows for rules being recursively applied while preserving the constituency of non-terminals on the right side.
- X-bar theory abstracts further away from the non-terminals that were defined in classical PSG (e.g. NPs and VPs) towards general X-bar rules involving XPs.

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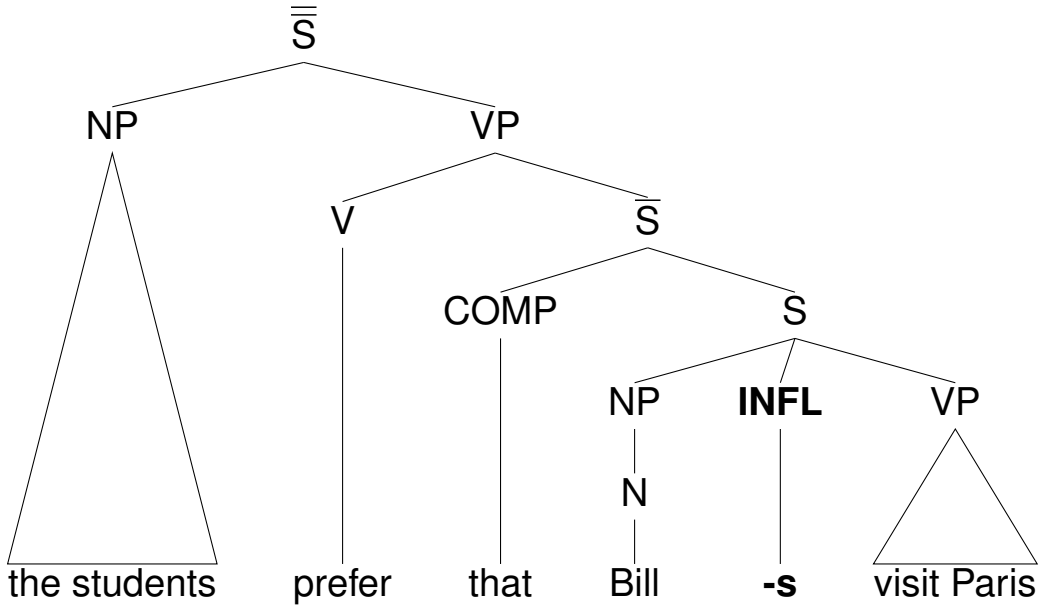
Lecture 10: Government & Binding

The Inflection Symbol (I)

Chomsky introduces the inflectional symbol (as INFL) in the following sentence in bracket notation:

the students [$_{VP}$ prefer [$_{\overline{S}}$ COMP [$_{S}$ Bill **INFL** [$_{VP}$ visit Paris]]]]

Chomsky (1981). Lectures on government and binding, p. 19.



Note: Don't worry about the tree notation here. For example, $\overline{S}$ and COMP will later be replaced by $\overline{C}$ and C.

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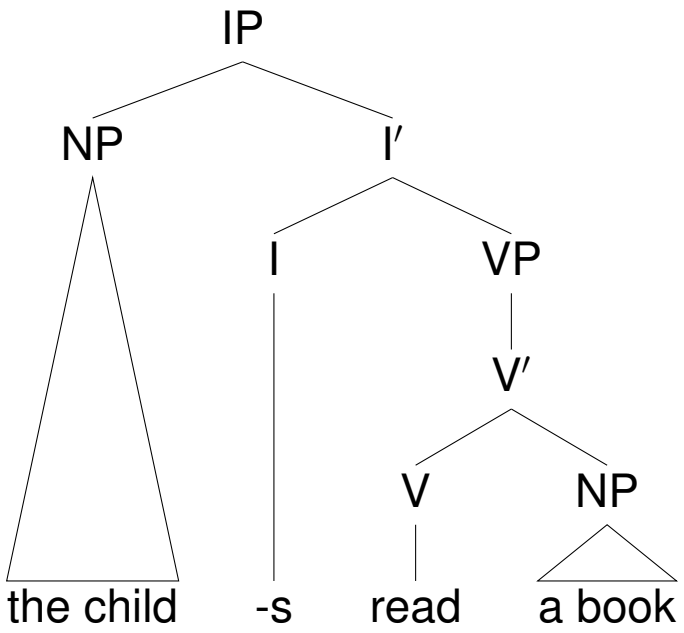
Inflectional Phrase

Just as in X-bar theory, we have unary branches from highest level projections to intermediate level projections if there are no other elements involved in the phrase (e.g. VP $\rightarrow$ V′). Also, the subject (the child) is considered the **specifier** of the IP (often referred to as SpecIP), and the object *a book* is the **complement** of the IP.



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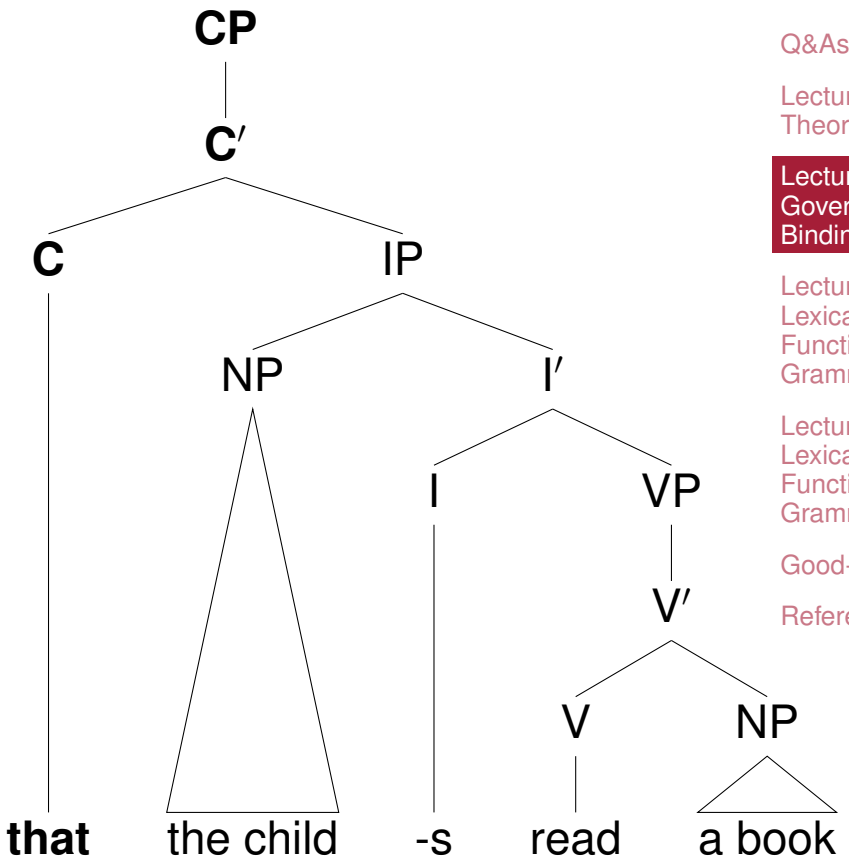
Complementizer Phrase

The CP is yet another level above the VP. It is relevant when a complementizer is used, but also for other syntactic phenomena, as we will see in the next section.

Note: The IP symbol essentially replaces the starting symbol S in GB analyses. Of course, we could keep the starting symbol and rewrite it into IP, but this would be somewhat redundant.



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Basic Concepts in Government & Binding

- Constituency ✓
- POS (✓)[4]
- Heads ✓
- Valency ✓
- Grammatical Functions(✓)[5]

[4] With the introduction of the CP and the C position comes the dillusion of clearly defined POS. Remember that words of different POS classes can now be assigned to C. Also I (finiteness, inflection) is a category that does not map onto classical POS.

[5] Same as for X-bar theory.

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Comparison: PSG and GB Theory

- Transformations allow for a systematic underlying connection between constructions such as active and passive, while PSG would have to handle this via separate rules.
- GB (and X-bar theory in some flavors) introduces C and I as non-terminals to enable transformations which require an underlying D-structure template and a S-structure realization via movement and traces.
- The introduction of C and I also leads to a divergence from the formerly fundamental constraint that POS are associated with particular lexical items.

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Lecture 11: Lexical Functional Grammar I

Untyped Feature Descriptions

A typical example of **untyped feature descriptions** are matrices that contain inflectional information of a given word form. In this particular context, the *feature values* are often given without the *feature labels*, since there is little syncretism between feature values which could make them ambiguous.

Example from GB theory (Lecture 7):

$$\textit{drank}: \begin{bmatrix} +\textit{past} \\ 3\textit{pers} \\ +\textit{sg} \end{bmatrix}.$$

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Example

Glossing:

(1) wayna runa mikuy-ta yanu-n
young man.NOM.SG food-ACC.SG cook-PRS.3SG
“The young man cooks the food.”

Feature Description:

wayna:
[]

runa:
$$\begin{bmatrix} \text{CASE} & \textit{nom} \\ \text{NUMBER} & \textit{sg} \end{bmatrix}$$

mikuy-ta:
$$\begin{bmatrix} \text{CASE} & \textit{acc} \\ \text{NUMBER} & \textit{sg} \end{bmatrix}$$

yanu-n:
$$\begin{bmatrix} \text{NUMBER} & \textit{sg} \\ \text{PERSON} & \textit{3} \\ \text{TENSE} & \textit{prs} \end{bmatrix}$$

Note: Henceforth, we will order the feature-value pairs alphabetically inside the matrix from top to bottom.

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Lists: Linguistic Examples

Going beyond the word level, we might want to capture the feature description, for example, of whole phrases such as *the green house*. In this particular example, we assume a HEAD feature for *house*, and a list of feature descriptions for the *complements* (COMP).[6]

phrase: *the green house*

$$\begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{POS} & \textit{noun} \\ \text{CASE} & \textit{nom} \vee \textit{acc} \vee \textit{dat} \\ \text{NUMBER} & \textit{sg} \end{bmatrix} \\ \text{COMP} & \left\langle \begin{bmatrix} \text{POS} & \textit{det} \end{bmatrix}, \begin{bmatrix} \text{POS} & \textit{adj} \end{bmatrix} \right\rangle \end{bmatrix}$$

[6]Note that we use *complement* here in a general sense, i.e. everything which is not the head of the phrase. This is similar to what we will see in Head-Driven Phrase Structure Grammar, though in HPSG the article would be called a *specifier*.

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Typed Feature Descriptions: Linguistic Example

When we deal, for instance, with *word forms* in our linguistic analyses, we might define a feature structure for the type *word*. Note, however, that the content of this structure is dependent on the theory we adopt, and the particular language we analyze.

Possible feature structure of the type *word*:

word	
ASPECT	*aspect*
BOUNDEDNESS	*boundedness*
CASE	*case*
GENDER	*gender*
MOOD	*mood*
NUMBER	*number*
PERSON	*person*
POS	*pos*
TENSE	*tense*
etc.	

Note: BOUNDEDNESS is here introduced to distinguish between *morphemes* and *words*, morphemes are *bound*, words are *unbounded* (according to the traditional definition.)

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Structure Sharing: Lingustic Example

A linguistic example of structure sharing is **agreement**. In the example below, between determiner, adjective and noun in German.

phrase: *das grüne Haus*

$$\begin{bmatrix} \textit{phrase} & & \\ \text{HEAD} & \begin{bmatrix} \textit{noun} & \\ \text{CASE} & \boxed{1}\ \textit{nom} \vee \textit{acc} \\ \text{GENDER} & \boxed{2}\ \textit{neut} \\ \text{NUMBER} & \boxed{3}\ \textit{sg} \end{bmatrix} \\ \text{COMPS} & \left\langle \begin{bmatrix} \textit{determiner} & \\ \text{CASE} & \boxed{1} \\ \text{GENDER} & \boxed{2} \\ \text{NUMBER} & \boxed{3} \end{bmatrix}, \begin{bmatrix} \textit{adjective} & \\ \text{CASE} & \boxed{1} \\ \text{GENDER} & \boxed{2} \\ \text{NUMBER} & \boxed{3} \end{bmatrix} \right\rangle \end{bmatrix}$$

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Lecture 12:
Lexical Functional Grammar II

Argument Structure (A-Structure)

The **argument structure (a-structure)** is a standardized representation of the valency of the main verb of a sentence. The general representational format is:

$$verb\langle x, y, z, \text{etc.} \rangle,$$

where x, y, z correspond to symbols which represent the participant roles of arguments and adjuncts of the verb.

Bresnan (2016), p. 15.

Sentence	**a-structure**
Peter sleeps.	sleep $\langle$ SUBJ $\rangle$
Mary sees him.	see $\langle$ SUBJ,OBJ $\rangle$
She gives the child a book.	give $\langle$ SUBJ,OBJ,OBJ$_{THEME}$ $\rangle$

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Functional Structure (F-Structure)

The **functional structure (f-structure)** is essentially a *feature description for a whole phrase*. The a-structure of a head is given under PRED, the grammatical functions which it *governs* (e.g. SUBJ and OBJ) receive separate features with their embedded feature descriptions.

Müller (2019). Grammatical theory, p. 223.

f-structure for *David devoured a sandwich*:

$$\begin{bmatrix} \text{PRED} & \text{`devour}\left\langle \text{SUBJ,OBJ} \right\rangle\text{'} \\ \text{TENSE} & \textit{past} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{`david'} \end{bmatrix} \\ \text{OBJ} & \begin{bmatrix} \text{SPEC} & \text{a} \\ \text{PRED} & \text{`sandwich'} \end{bmatrix} \end{bmatrix}$$

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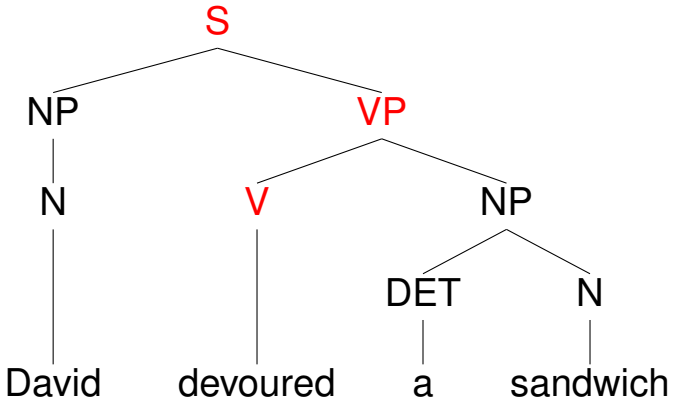
Constituent Structure (C-Structure)

The highest node (S) together with the overall head (VP) in c-structure are equivalent to the overall f-structure.

c-structure:



f-structure:

$$\begin{bmatrix} \text{PRED} & \text{'devour}\langle \text{SUBJ,OBJ} \rangle\text{'} \\ \text{TENSE} & \textit{past} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'david'} \end{bmatrix} \\ \text{OBJ} & \begin{bmatrix} \text{SPEC} & \text{a} \\ \text{PRED} & \text{'sandwich'} \end{bmatrix} \end{bmatrix}$$

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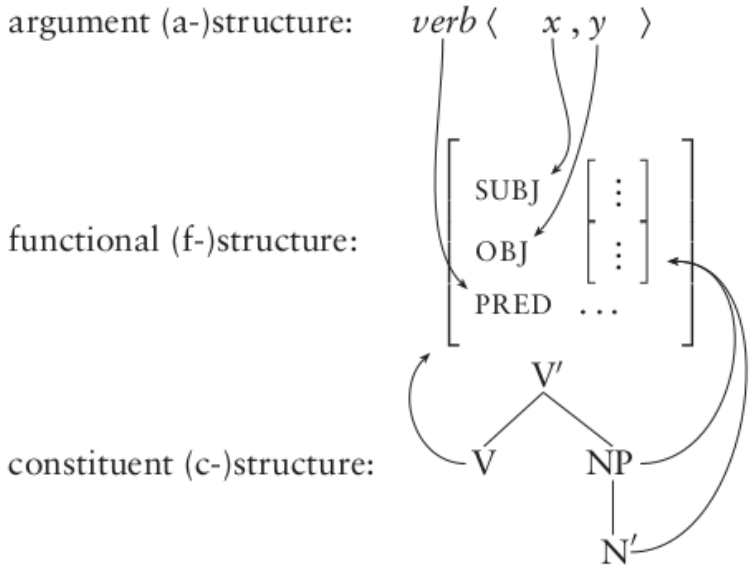
Summary: Structural Levels

"Each structure models a different dimension of grammatical substance: role, function, or category. **Roles** correspond to the grammatically expressible participants of eventualities (modeled by a-structure), **syntactic functions** belong to the abstract system of relators of roles to expressions (modeled by f-structure), and **phrase structure categories** belong to the overt structure of forms of expression (modeled by c-structure)."

Bresnan et al. (2016), p. 15.

Parallel structures (LFG):



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Basic Concepts in LFG

- Constituency ✓
- POS ✓
- Heads ✓
- Valency ✓
- Grammatical Functions ✓

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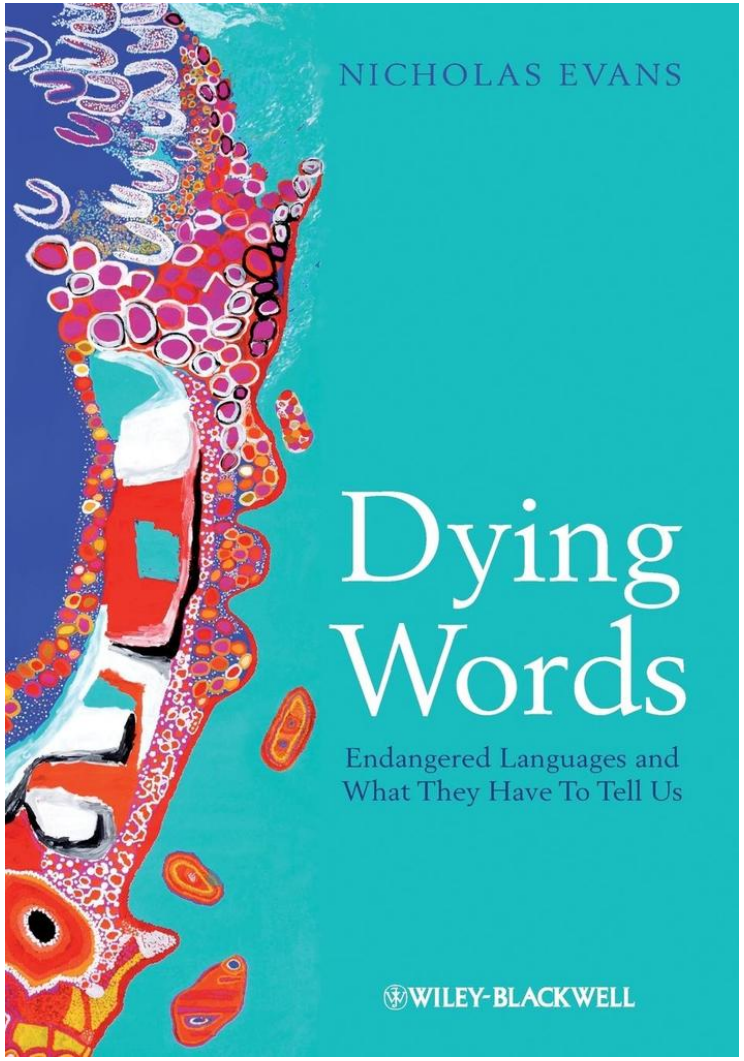
Good-Reads

Good-Reads

Language Diversity and Endangerement



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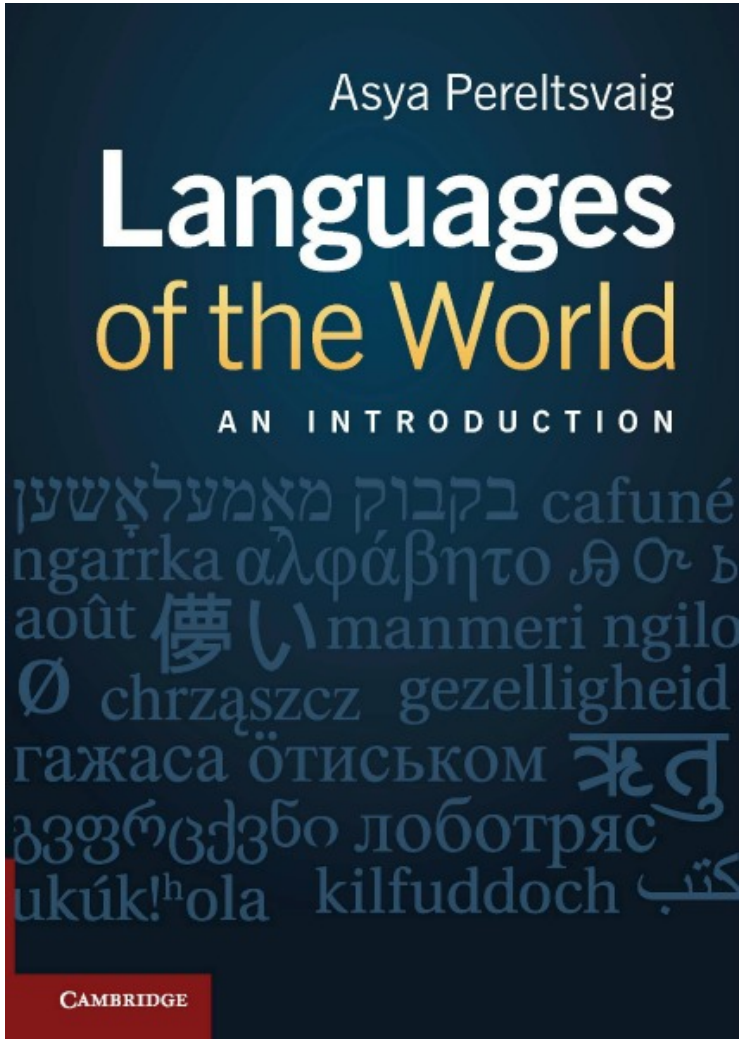
Good-Reads

Language Diversity and Typology



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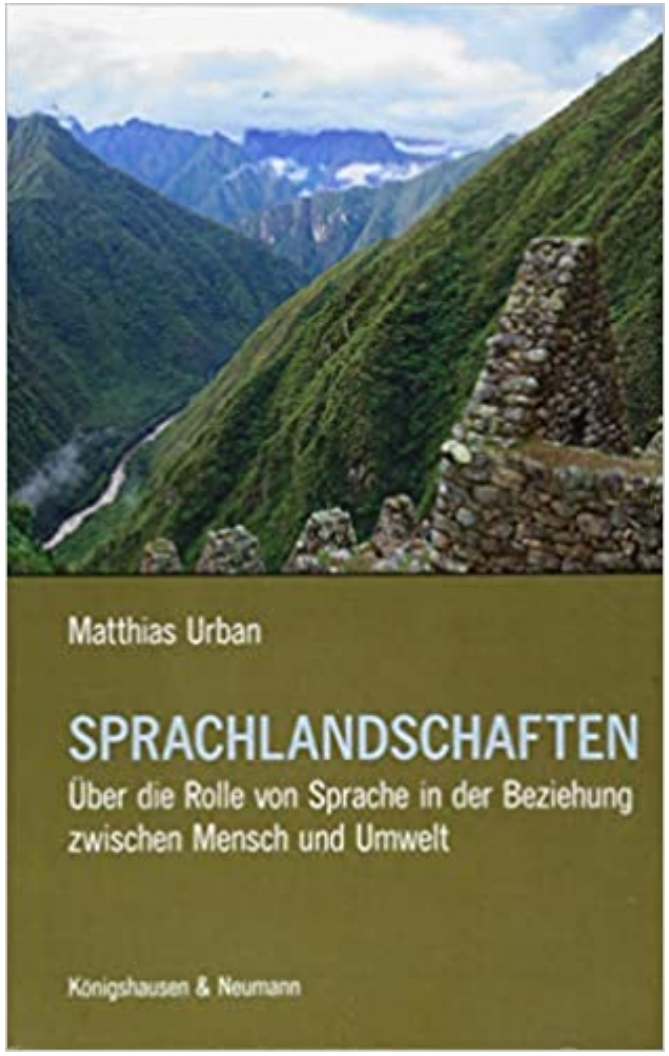
Good-Reads
Language and Environment



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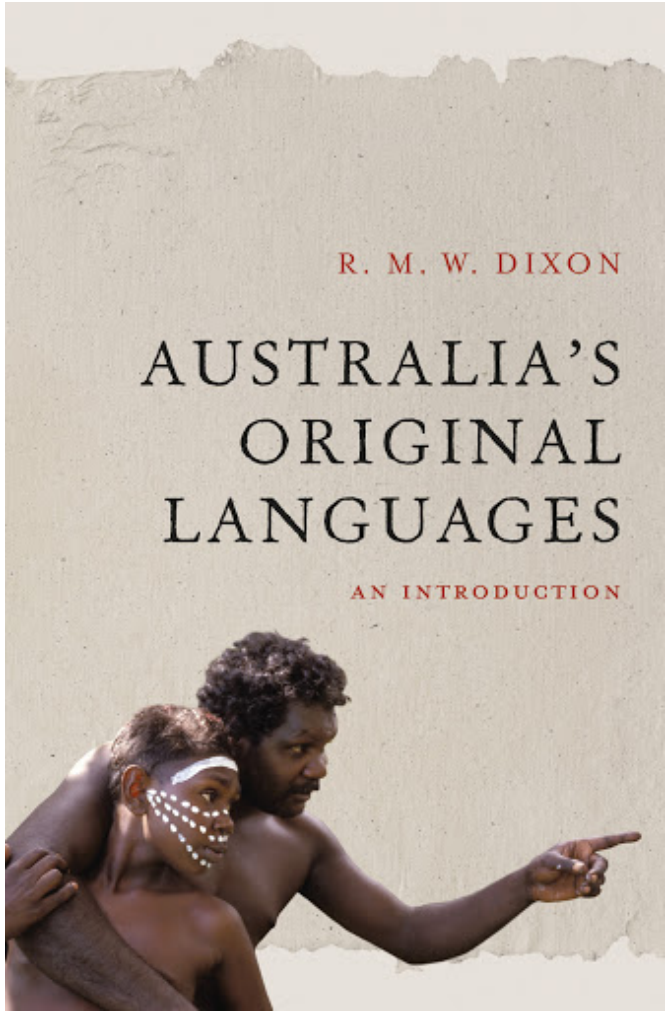
Good-Reads

Australian Languages and Language Politics



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Thank You.

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