

Introduction to Semantic Theory

Structural Ambiguity II

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Class: April 27, 2016

Connecting back to the previous lecture

The **central points** of the previous lecture:

- ▶ There are sentences that have **two or more possible readings** (= ways to be interpreted). They are **ambiguous**.
- ▶ The source for the ambiguity can vary; we distinguish lexical, structural (and scope), and referential ambiguities.
- ▶ Except for readings depending on lexical ambiguity, distinct readings can be associated with **distinct syntactic structure**.
- ▶ To each syntactic structure with disambiguated word senses corresponds exactly one interpretation (but not vice versa!).

Warming up

Example (1) is ambiguous:

(1) *Peter and Mary decided to meet in the garden.*

What are the two readings of (1) and how do they arise?

Warming up

Example (1) is ambiguous:

(1) *Peter and Mary decided to meet in the garden.*

What are the two readings of (1) and how do they arise?

- ▶ Peter and Mary decided something in the garden, namely to meet.
- ▶ Peter and Mary decided something, namely to meet in the garden.

Aim for today

The aim for today: deepen our understanding of how the meaning that is composed for a sentence depends on its syntactic structure

- ⇒ We'll identify one dedicated level of syntactic representation that semantic composition depends on: **logical form.**
- ⇒ **We will show:** there are processes that target the finished syntactic structure to build the logical form.

(This lecture again follows Sternefeld & Zimmermann 2013, Chapter 3)

Scope

Some words with functional meaning have **scope**, which determines which other expressions' interpretations are dependent on the meaning contributed by these words.

- ▶ **Negation** (*not*): the scope of *not* is what is negated.
- ▶ **Conjunction and Disjunction** (*and, but, or*): the scope of these items determines what is conjoined/disjoined.
- ▶ **Subjunctions** (*because, although, . . .*): the scope associated with these items determines what the CP introduced by these items comments on/modifies.

- (2) a. *The doctor didn't leave because he was angry.*
 b. *the girl and the boy in the park*

Other expressions that have scope: quantifying expressions

More scope ambiguities – I

The following example illustrates another scope ambiguity:

(3) *Beide Studenten kamen nicht.*

What are the two readings of (3)? Which functional expressions interact?

More scope ambiguities – I

The following example illustrates another scope ambiguity:

(3) *Beide Studenten kamen nicht.*

What are the two readings of (3)? Which functional expressions interact?

- ▶ **Reading 1:** For both students, it is not the case that they came.
- ▶ **Reading 2:** It is not the case that both students came.

⇒ Functional expressions: *beide Studenten, nicht*

What are the scope orders for the two readings?

More scope ambiguities – II

Construct scenarios that show that the two readings of (3) are distinct.

More scope ambiguities – II

Construct scenarios that show that the two readings of (3) are distinct.

Scenarios that distinguish the two readings of (3):

did not come
Student 2

● ●

Student 1
did not come

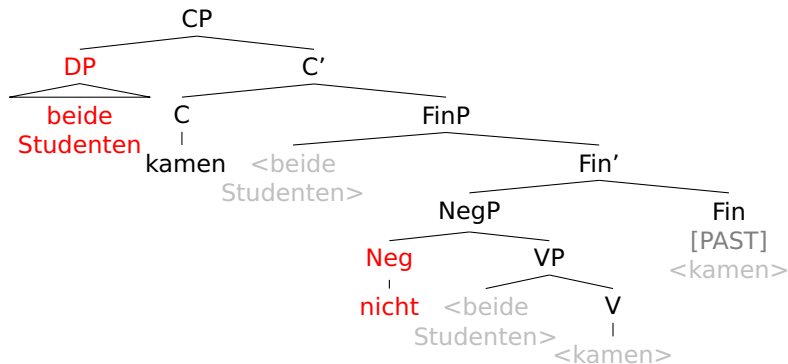
did not come
Student 2

● ●

Student 1
came

More scope ambiguities – III

Syntactic structure of (3): two readings?



Reconstruction – I

Sometimes movement (remerge) in the course of syntactic structure building is reversed to derive available readings. The process of “undoing movement” or **interpreting an expression in a position it has been moved from** is called **reconstruction**.

Reconstruction is commonly assumed for **verb movement** and **movement of the subject**. Both are assumed to be reconstructed into their base position (= their first position).

Reconstruction – I

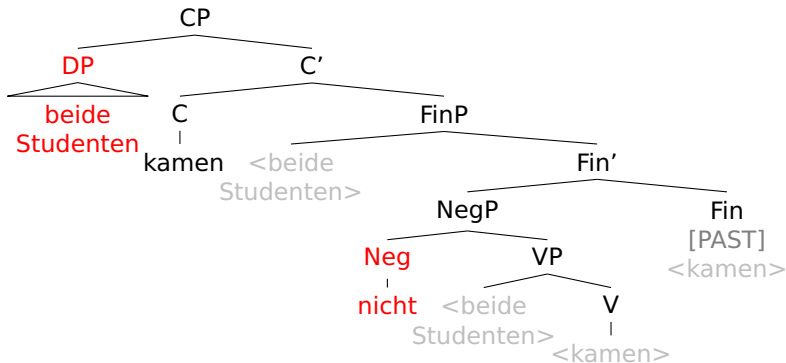
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How does this help us with the two readings of (3)?

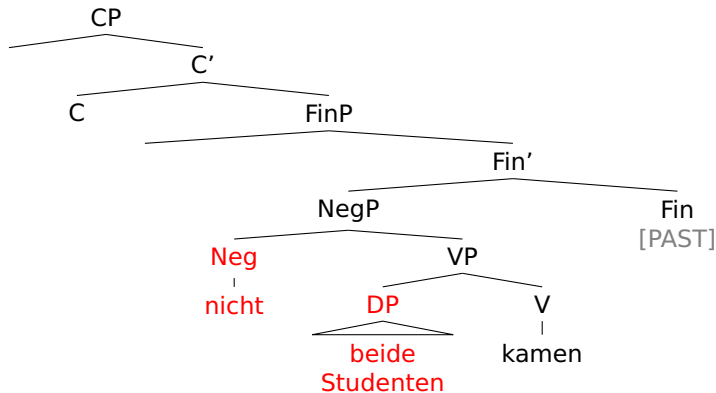
More scope ambiguities – IV

How does reconstruction help?



More scope ambiguities – IV

How does reconstruction help?



Reconstruction – II

One important question still needs to be addressed:

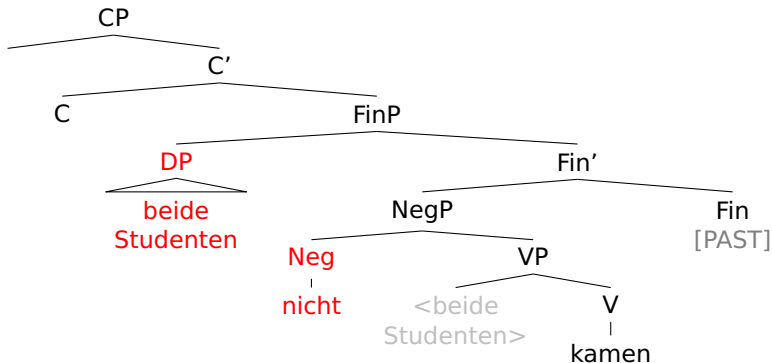
- (4) Does reconstruction always apply or only when needed?

Common assumptions:

- ▶ Verb movement always reconstructs.
- ▶ Movement of the subject reconstructs as is necessary for scopal reasons.

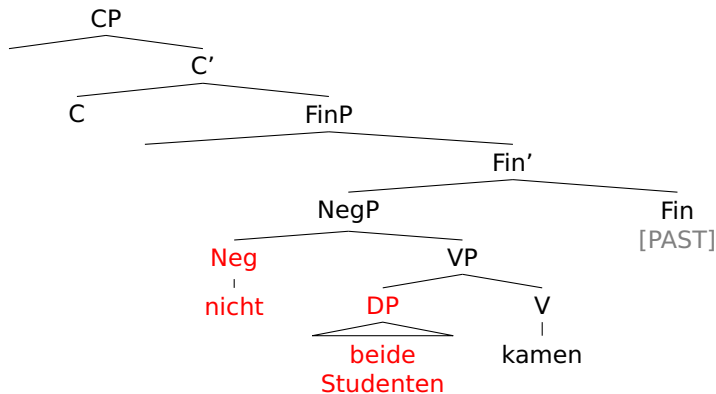
More scope ambiguities – IV

Interpretable structures for (3) – reading 1 (surface scope)



More scope ambiguities – IV

Interpretable structures for (3) – reading 2 (inverse scope)



Logical Form

The two interpretable structures derived for the two readings (possible scope orderings) of (3) are distinct from the full syntactic structure we have seen above.

This [new level of structural representation](#) that is derived by – among other processes – reconstruction is called **logical form (LF)**.

It is assumed that semantic composition takes the hierarchical information at LF as guideline for the order in which the expressions in the structure are combined.

An example in English – I

A similar example to the German one in (3) is given in (5).

(5) *Nobody must stay.*

Readings? Functional expressions? Scope order?

An example in English – I

A similar example to the German one in (3) is given in (5).

(5) *Nobody must stay.*

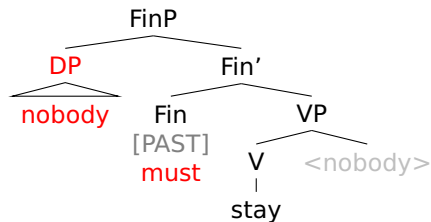
Readings? Functional expressions? Scope order?

- ▶ **Reading 1:** For nobody it is the case that (s)he must stay.
- ▶ **Reading 2:** It is necessary that nobody stays.

⇒ Functional expressions: *nobody*, *must*

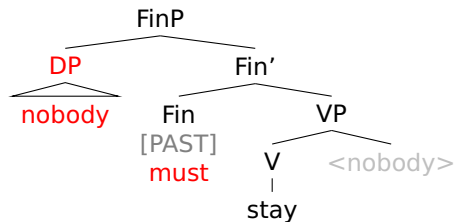
An example in English – II

Syntactic structure for (5)



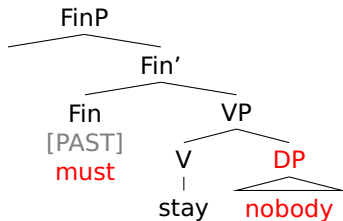
An example in English – II

Interpretable structures for (5) – reading 1 (surface scope)



An example in English – II

Interpretable structures for (5) – reading 2 (inverse scope)



One more reconstruction example – I

The following example is more tricky than the examples we had before:

(6) *How many dogs did everyone feed?*

Readings? Functional expressions? Scope order?

One more reconstruction example – I

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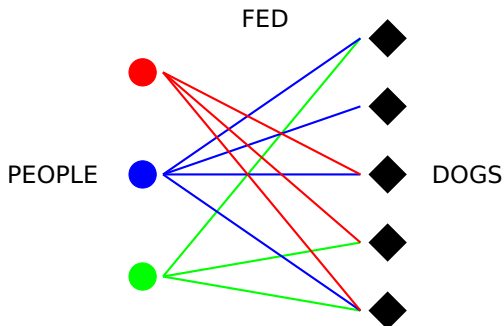
Readings? Functional expressions? Scope order?

- ▶ **Reading 1:** For how many dogs it is the case that everyone fed them?
- ▶ **Reading 2:** For which number n is it the case that every person fed n dogs?

⇒ Functional expressions: *how many dogs, everyone*

One more reconstruction example – II

Question: Given the two readings for (6) (*How many dogs did everyone feed?*), what would the answer be to that question in both readings in the following scenario?



One more reconstruction example – III

First reading: corresponds to the surface order of *how many dogs* and *everyone*.

Second reading: does not arise from full reconstruction of *how many dogs*. Zimmermann & Sternefeld argue that only the common noun *dog* and part of the expression that talks about amounts of dogs are reconstructed.

- ▶ **Reading 1:** For how many dogs it is the case that everyone fed them?
- ▶ **Reading 2:** For which number n is it the case that every person fed n dogs?

⇒ **Partial reconstruction**

Interim summary

- ▶ Scope ambiguities may arise from different structural positions that the interacting functional expressions can occupy in the syntactic structure.
- ▶ **Alternative:** Scope ambiguities arise from reconstruction, i.e., from interpreting the functional material in different positions that it has occupied during the derivation of the syntactic structure.
- ▶ Reconstruction is usually assumed for the subject and the main verb.
- ▶ The interpretable structure is called the logical form (of the sentence/reading).

A third configurational variant – I

Multiple possible attachment sites and reconstruction do not exhaust all possible sources for scope ambiguities. Consider the following example:

(7) *Exactly one student read every book.*

Readings? Functional expressions? Scope order?

A third configurational variant – I

Multiple possible attachment sites and reconstruction do not exhaust all possible sources for scope ambiguities. Consider the following example:

(7) *Exactly one student read every book.*

Readings? Functional expressions? Scope order?

- ▶ **Reading 1:** For exactly one student it is the case that (s)he read every book.
- ▶ **Reading 2:** For every book there is exactly one student who read it.

⇒ Functional expressions: *exactly one student, every book*

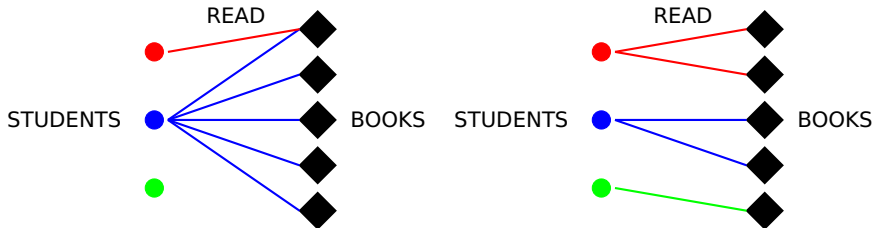
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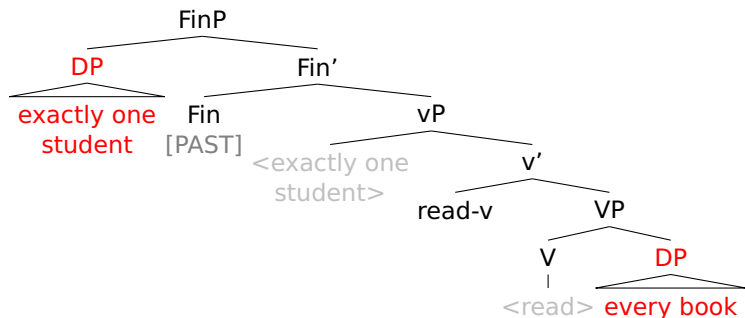
Scenarios that distinguish the two readings of (7):



A third configurational variant – III

Given the syntactic structure that is derived for (7) – why can reconstruction not derive the two readings?

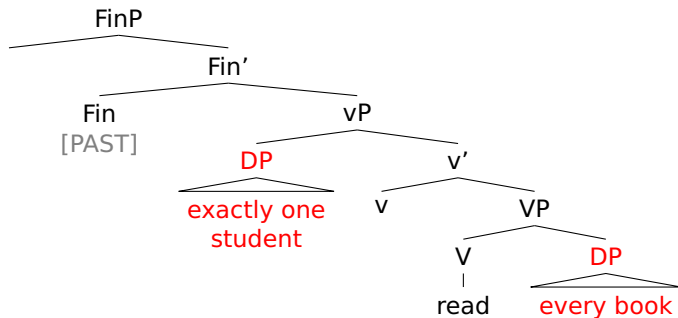
Syntactic structure



A third configurational variant – III

Given the syntactic structure that is derived for (7) – why can reconstruction not derive the two readings?

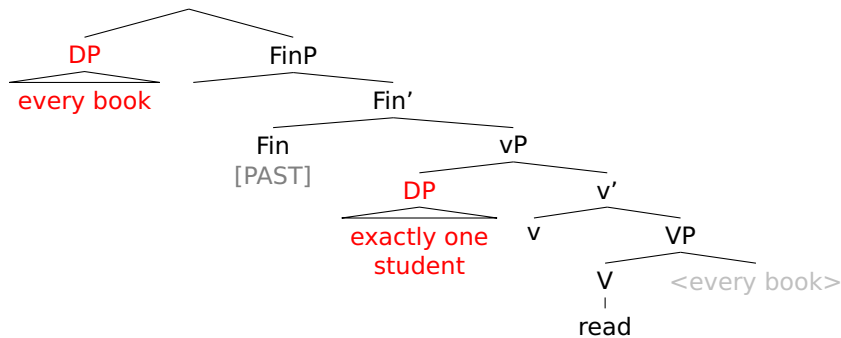
1st reading – surface scope (after reconstruction):



A third configurational variant – III

Given the syntactic structure that is derived for (7) – why can reconstruction not derive the two readings?

2nd reading – inverse scope (what is needed):



Quantifier Raising

The movement (remerge) of the quantified direct object in the structure for the second reading of (7) is necessary to derive both possible interpretations.

It is called **quantifier raising (QR)**.

QR has a **special status**: it applies after the syntactic structure of a sentence has already been built up; like reconstruction, it applies for purely semantic reasons and does not affect the word order of a sentence.

The **logical form (LF)** of a sentence/reading is derived from applying reconstruction and QR.

Scope–C-command principle revisited

At this point, we can make the Scope–C-command principle from last time more precise:

(8) **The Scope–C-command principle**

If an expression X has scope over an expression Y , then syntactically, X c-commands Y **at LF**.

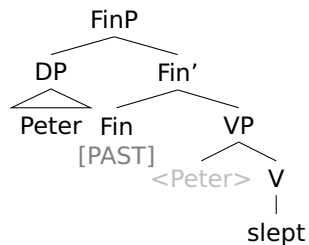
Interpretable structures

The hierarchical structures that we will use from now on will be **simplified versions of the corresponding LFs**.

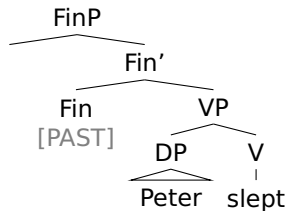
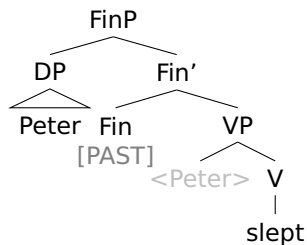
Since we will not be concerned with tense/aspect, modality, and other more complicated functional expressions, we will

- ▶ always reconstruct the main verb to VP
- ▶ always reconstruct the subject as far as possible (minding scope relations)
- ▶ apply QR when needed
- ▶ omit any empty nodes that emptied after the previous three steps

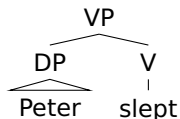
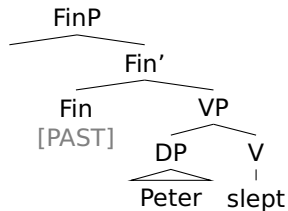
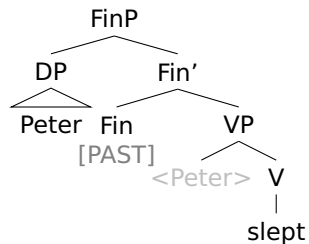
Example 1 – *Peter slept*



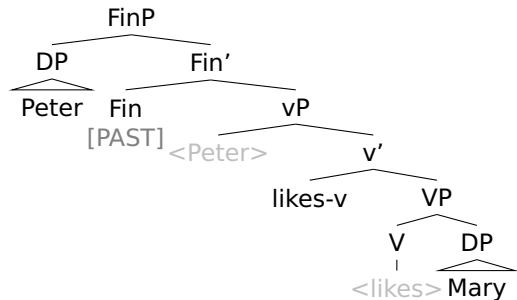
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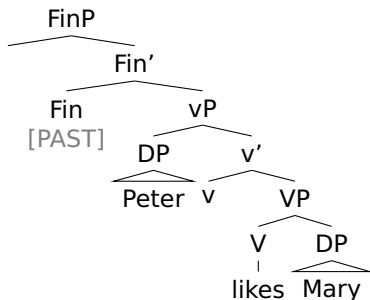
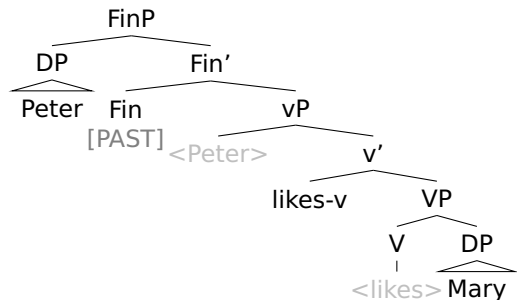
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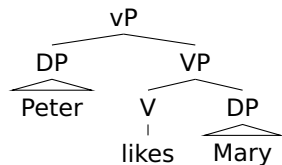
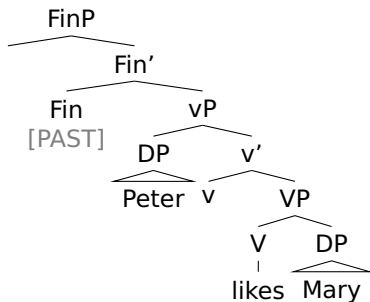
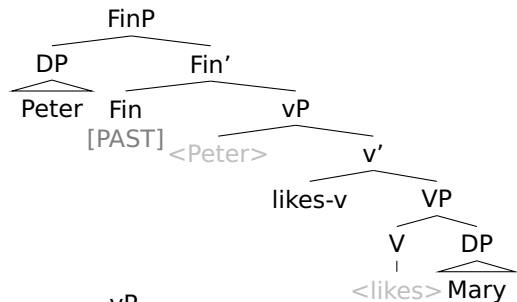
Example 2 – *Peter likes Mary*



Example 2 – *Peter likes Mary*

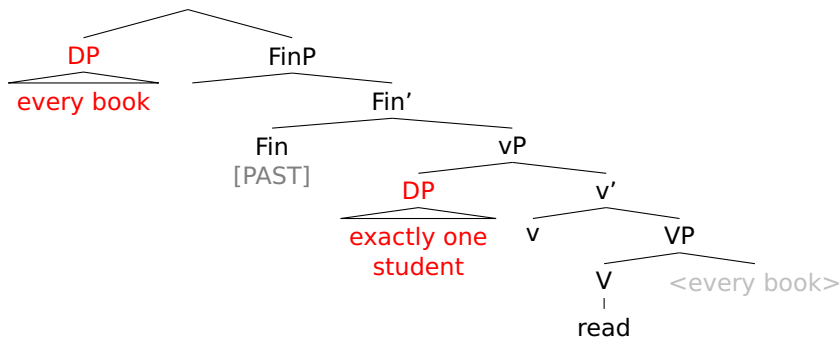


Some examples

Example 2 – *Peter likes Mary*

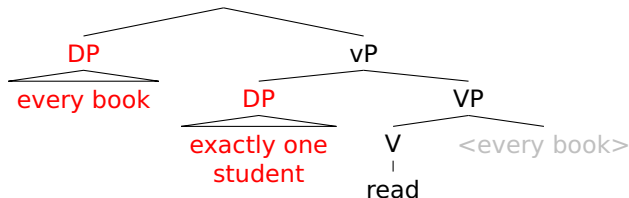
Ex. 3 – *Exactly one student read every book*

(inverse scope reading, continued from above)



Ex. 3 – *Exactly one student read every book*

Final interpretable structure:



Summary

- ▶ There is a special level of hierarchical structure that is the basis for the composition process: **logical form** (LF).
- ▶ The **basis for building the LF** of a sentence/reading is the syntactic structure derived for the sentence.
- ▶ The processes of **reconstruction** and **quantifier raising** (QR) apply “after syntax” – e.g., to derive the LFs of inverse scope readings.

The hierarchical structures used in this course are simplified versions of the LF of a sentence/reading.