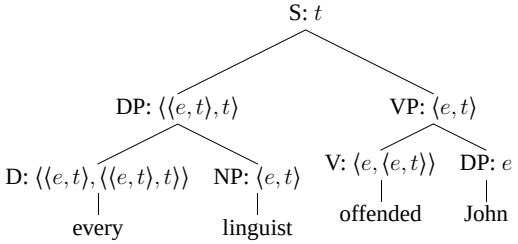
Elizabeth Coppock
coppock@phil.hhu.de
Wed. Jan 18th, 2011
Time: 14:30–16:00

Compositional Semantics
Heinrich Heine University
Winter Semester 2011/12
Room: 25.22-U1.72

The problem of quantifiers in object position

(1)



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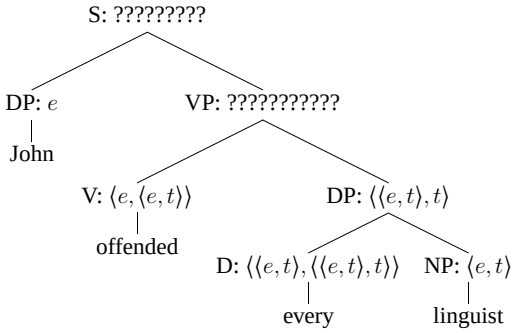


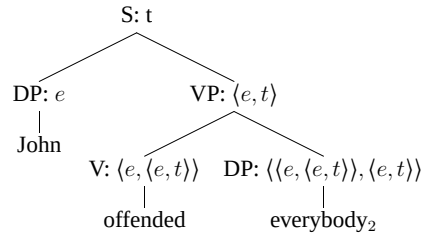
Two types of approaches to the problem:

1. Move the quantifier phrase to a higher position in the tree (via Quantifier Raising), leaving a DP trace of type e in object position. (Or simulate movement via Cooper Storage, as in Head-Driven Phrase Structure Grammar.)

2. Interpret the quantifier phrase *in situ*. In this case one can apply a type-shifting operation to change its type.

An *in situ* approach. Multiple versions of lexical items:
$[\![\text{everybody}_1]\!] = \lambda f \in D_{\langle e,t\rangle}$. for all persons $x \in D$, $f(x) = 1$
$[\![\text{everybody}_2]\!] = \lambda f \in D_{\langle e,\langle e,t\rangle\rangle}$. $[\lambda x \in D$. for all persons $y \in D$, $f(y)(x) = 1\ ]$
$[\![\text{somebody}_1]\!] = \lambda f \in D_{\langle e,t\rangle}$. there is some person $x \in D$ such that $f(x) = 1$
$[\![\text{somebody}_2]\!] = \lambda f \in D_{\langle e,\langle e,t\rangle\rangle}$. $[\lambda x \in D$. there is some person $y \in D$ such that $f(y)(x) = 1\ ]$

(3)



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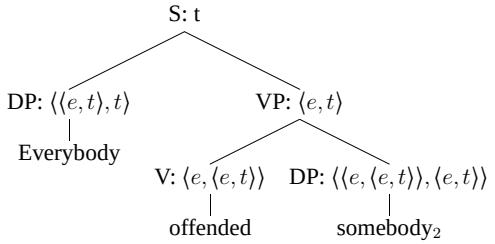
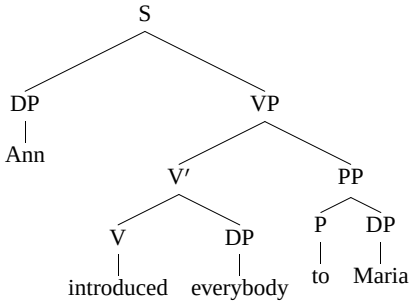


Note: This only gets one of the readings.

We need a new *everybody* for ternary relations:

(5)



What type are the determiners (note: $et = \langle e, t\rangle$)?

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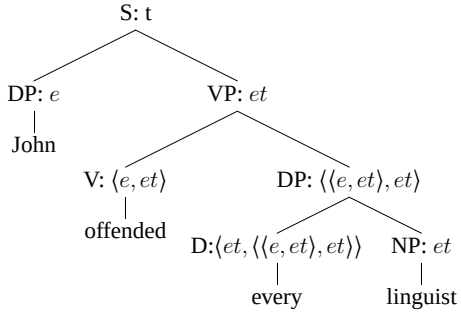


How do we get this *every* from our normal $\langle et, \langle et, t\rangle\rangle$ *every*? A lexical rule.

(7) For every lexical item δ_1 with a meaning of type $\langle et, \langle et, t\rangle\rangle$, there is a (homophonous and syntactically identical) item δ_2 with the following meaning of type $\langle et, \langle\langle e, et\rangle, et\rangle\rangle$:
$[\![\delta_2]\!] = \lambda f \in D_{\langle e,t\rangle} . [\lambda g \in D_{\langle e,et\rangle} . [\lambda x \in D . [\![\delta_1]\!](f)(\lambda z \in D . g(z)(x))\ ]\ ]$

Note: Flexible types were originally proposed for connectives like *and* and *or* to deal with coordinations and disjunctions of expressions with a wide variety of semantic types:

(8) [[John stays at home] and [Mary works]].

(9) Ann will be [[in the garden] or [on the porch]].

(10) Bill [[writes] and [reads]] Portugese.

(11) [[A few books] or [a lot of articles]] will be read.

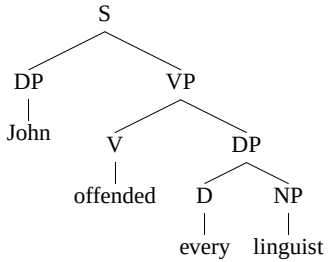
A Quantifier Raising approach. Several levels of representation:

- Deep Structure (DS): Where the derivation begins
- Surface Structure (SS): Where the order of the words is what we see
- Phonological Form (PF): Where the words are realized as sounds
- Logical Form (LF): The input to semantic interpretation

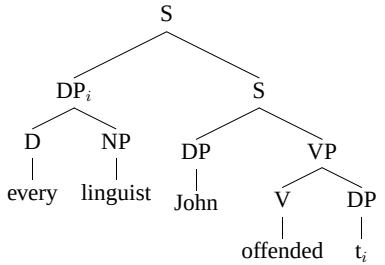
Transformations map from DS to SS, and from SS to PF and LF. (Since the transformations from SS to LF happen "after" the order of the words is determined, we do not see the output of these transformations. These movement operations are in this sense *covert*.)

A transformation called QR (Quantifier Raising) maps the SS structure in (12a) to something like the LF structure in (12b)

(12) a.

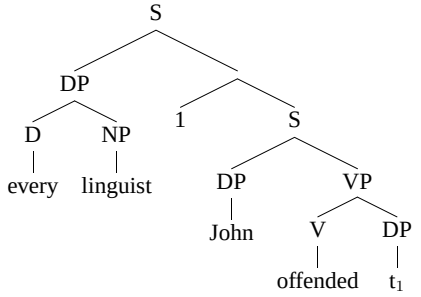


b.



Actually, Heim and Kratzer propose the following, so that they can make it work with Predicate Abstraction:

(13)



(14) **Predicate Abstraction**
Let α be a branching node with daughters β and γ, where β dominates only a numerical index i. Then for any variable assignment a, $[\![\alpha]\!]^a = \lambda x \in D . [\![\gamma]\!]^{a^{x/i}}$

Arguments in favor of the movement approach:

Argument #1: Scope ambiguities. In order to get both readings of *Everybody loves somebody,* we have to introduce yet even more complicated types. Scope ambiguities are trivially derived under the movement approach.

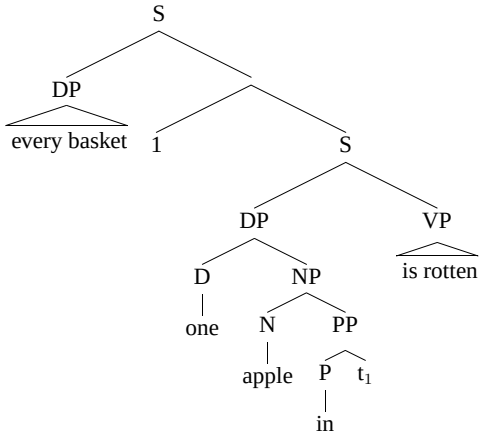
Argument #2: Inverse linking. There is one class of examples that cannot be generated under an *in situ* approach:

(15) One apple in every basket is rotten.

This does not mean: 'One apple that is in every basket is rotten'. That is the only reading that an *in situ* analysis can give us.

QR analysis:

(16)



Argument #3: Antecedent-contained deletion

(17) I read every novel that you did.

Like regular VP ellipsis:

(18) I read *War and Peace* before you did.

except that the antecedent VP is contained in the elided VP!

To create an appropriate antecedent, you have to QR the object.

Argument #4: Quantifiers that bind pronouns

(19) a. Mary blamed herself.
b. Mary blamed Mary.

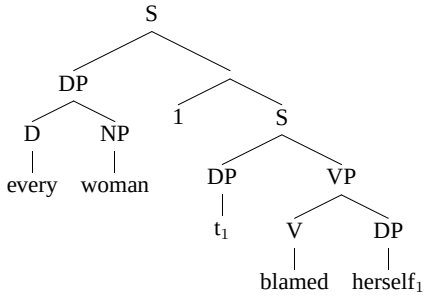
(20) a. Every woman blamed herself.
b. Every woman blamed every woman.

(21) No man noticed the snake next to him.

Treat pronouns as variables and use QR ⇒ no problem.

(22) **Traces and Pronouns Rule (TP)** (p. 116)
If α is a pronoun or trace and a is an assignment and i is in the domain of a, $[\![\alpha_i]\!]^a = a(i)$

(23)



But how do we get the truth conditions on the in-situ approach?

(24) $[\![[_{VP} [_{V} \text{ blamed }] [_{DP} \text{ herself}_1]]]\!]^a = \lambda x . x \text{ blamed } a(1)$

How do we combine this with *every woman*? We cannot get an assignment-independent denotation.