Rooth/Hamblin alternative computation

☞ Reading for Monday: Huang (1982), p. 492–502, 524–530.

1 Previously in LING 721...

1.1 In-situ Association with Focus

Recall: English association with focus involves F-marking on some constituent in the sentence. Operators c-commanding the F-marking can make use of the contribution of focus.

(1) a. I *only* introduced [Sue]$_F$ to Bill.
b. I *only* introduced Sue to [Bill]$_F$.
c. I *only* introduced [Sue]$_F$ to [Bill]$_F$.

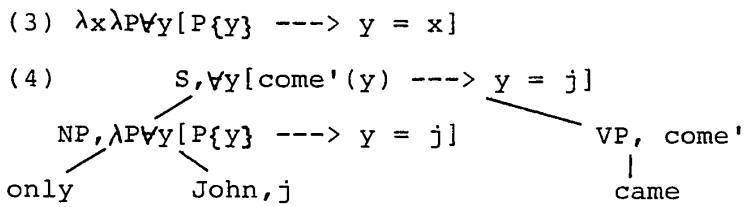
(2) **Semantics for *only* from Horn (1969):**
Only(x, f) presupposes $f(x)$ and asserts $\neg\exists y(y \neq x \wedge f(y))$

(1a) Presupposes: I introduced Sue to Bill. (=the *prejacent*)
Asserts: $\neg\exists y$: $y \neq$ Sue and I introduced y to Bill

1.2 Rooth's (1985) proposal for constituent *only*

Constituent *only* forms a constituent with the XP it precedes. Here this is the DP "John." Call this an "*only*-phrase."

(3) Rooth (1985, p. 28):



The semantics should look pretty familiar. It's (sort of) a generalized quantifier denotation. With types:

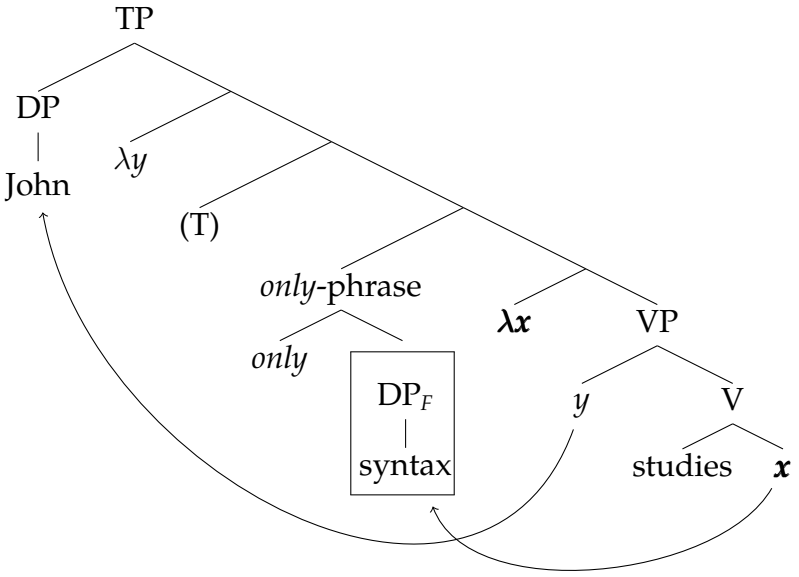
(4) $[\![only]\!]_{\langle e,\langle\langle e,t\rangle,t\rangle\rangle} = \lambda x_e.\lambda P_{\langle e,t\rangle}.\forall y_e.\,(P(y) \rightarrow y = x)$

1.3 A covert movement approach to adverb *only*

One approach to adverb *only* is to *turn it into a constituent only*:

(5) **Rooth's (1985) "scope theory":**
Only is always a two-place operator, as in (4). *Only* covertly moves the F-marked constituent to become its *first argument*. The movement will introduce a lambda-binder on the sister of the *only*-phrase.

(6) John *only* studies [syntax]$_F$



2 Association with Focus without movement

There are reasons to think that the movement analysis may not be right for adverb *only*.

2.1 Adverb *only* is not sensitive to islands

(7) **English adverb-*only* and adverb-*even* are not island-sensitive**
a. Dr. Svenson *only* rejected [the proposal that [John]$_F$ submitted]. (Rooth, 1996)
b. * [Which student]$_1$ did Dr. Svenson reject [the proposal that t_1 submitted]?

(8) a. I don't know anyone who grows bananas, I *only* know [a guy who smokes$_F$ them]. (based on Anderson 1972)
b. * What do you know [a guy who does *t* with bananas]?

2.2 The weak crossover argument

Chomsky (1976) argues for a version of the movement analysis for constituent *only* based on data from weak crossover.

(9) **The WCO configuration:**
*Op$_i$ ... pron$_i$ ... t$_i$
(where pron$_i$ and t$_i$ do not c-command each other, Op$_i$ c-commands both)

(10) a. Who$_i$ t$_i$ loves his$_i$ mother?
b. ?? Who$_i$ does his$_i$ mother love t$_i$?
(bad on the reading: Who is such that his mother loves him?)
(compare with: Who$_i$ [t$_i$ is loved [by his$_i$ mother]]?)

(11) a. Every man$_i$ was betrayed by the woman he$_i$ loved.
b. ?? The woman he$_i$ loved betrayed every man$_i$
(bad on the reading: For each man x, the woman x loved betrayed x.)

(12) **Adverb *only* and free focus appear to exhibit WCO effects** (Chomsky, 1976)
a. John$_{F,i}$ was betrayed by the woman he$_i$ loved.
b. * The woman he$_i$ loved betrayed John$_{F,i}$.

(13) a. We *only* expect John$_{F,i}$ to be betrayed by the woman he$_i$ loves.
b. * We *only* expect the woman he$_i$ loves to betray John$_{F,i}$.

Therefore, *only* seems to pattern with *wh*-phrases, which undergo overt movement, and with quantifiers, which we believe undergo covert movement.

Note that the same effect occurs with strong crossover, which yield a stronger judgment of unacceptability:

(14) **Adverb *only* appears to exhibit SCO effects** (Rooth, 1985, p. 70):
a. We *only* expected [him$_i$]$_F$ to claim that he$_i$ is brilliant.
b. * We *only* expected him$_i$ to claim that [he$_i$]$_F$ is brilliant.
c. $\forall z$ [we expected z to claim that z is brilliant $\rightarrow z$ = g(i)]

Rooth (1985): the focused pronoun in (14) needs to take scope above the co-indexed pronoun. Movement inserts a λ-binder below the landing site, which is able to bind both instances of the pronoun, yielding the bound reading. This movement is independent of focus movement—it is necessary for binding purposes. But, movement in (14b) results in a crossover configuration and hence is blocked.

☞ This is consistent with an in-situ theory of focus.[1]

[1] A good question brought up by Bernhard in a previous class and which remains unresolved under this story is how we get binding in: "John *only* studied [French]$_F$ because he likes it."

3 Rooth (1985, 1992): in-situ Association with Focus

☞ The most common approach to Association with Focus in English.

What we want to capture is the following intuition:

(15) I *only* introduced Sue_F to Bill.
$\approx \forall y$: I introduced y to Bill $\rightarrow y = \text{Sue}$

(16) I *only* introduced Sue to Bill_F.
$\approx \forall y$: I introduced Sue to $y \rightarrow y = \text{Bill}$

(17) $[\![only]\!]_{\langle e,\langle\langle e,t\rangle,t\rangle\rangle} = \lambda x_e.\lambda P_{\langle e,t\rangle}.\forall y_e.\,(P(y) \rightarrow y = x)$

Next consider a sentence like (18), where *only* associates with an entire VP.

(18) He *only* swims_F.
$\approx \forall Q_{\langle e,t\rangle}$: He Q's $\rightarrow Q = \text{swim}$

Our current semantics for *only* (17) can't be used in this case. This is a general issue with the denotation in (17) which has already come up in our discussion. We also can't use it in case *only* associates with quantifiers, or adverbs, or PPs, ets.

Reverse-engineering the description of the meaning of (18), we can write a new lexical entry for *only*:

(19) $[\![only]\!] = \lambda P_{\langle e,t\rangle}.\lambda x_e.\,[\,\forall Q_{\langle e,t\rangle}\,[\,Q(x)\ \&\ C(Q)\,]\rightarrow Q = P\,]$

"C is the characteristic function of a set of properties, which we think of as the relevant set of properties." Rooth (1985), p. 43.

In the case of (18), the relevant set of properties in C must be other VP denotations. The sentence asserts that John has no relevant properties distinct from 'swim.'

We can use the same kind of denotation for *only* in the case of examples (15–16).

(20) a. I *only* introduced Sue_F to Bill.
$\approx$ I have no relevant properties other than introducing Sue to Bill.
The relevant properties: introducing Mary to Bill, introducing Jane to Bill, ...

b. I *only* introduced Sue to Bill_F.
$\approx$ I have no relevant properties other than introducing Sue to Bill.
The relevant properties: introducing Sue to Mary, introducing Sue to Jane, ...

(So somehow the focus should determine the structure of the relevant properties.)

4 Alternative semantics

We are going to use the notation in Rooth (1992). Our goal is to build up the 'relevant set of alternatives' compositionally.

(21) **Definitions**:

a. Each node ϕ has, in addition to its ordinary semantic value, a focus semantic value.

b. We will use $[\![\cdot]\!]^o$ (or: $[\![\cdot]\!]$) to compute the ordinary semantic value of a node and $[\![\cdot]\!]^f$ to compute the focus semantic value of a node.

c. $[\![\phi]\!]^o$, the ordinary semantic value, is the value of ϕ that we know and love.

d. $[\![\phi]\!]^f$, the focus semantic value, is the set of all ordinary semantic values obtained by substituting alternatives for any F-marked subparts of ϕ.

Note: (if they are both defined) $[\![\alpha]\!]^o \in [\![\alpha]\!]^f$

Exercise: What are the ordinary and focus semantic value of the following formulas?

(22)

a. $[\![\text{John}_F \text{ likes Mary}]\!]^o =$

b. $[\![\text{John}_F \text{ likes Mary}]\!]^f =$

c. $[\![\text{ran quickly}_F]\!]^o =$

d. $[\![\text{ran quickly}_F]\!]^f =$

e. $[\![\text{John [likes Mary]}_F]\!]^o =$

f. $[\![\text{John [likes Mary]}_F]\!]^f =$

g. $[\![\text{Mary}]\!]^o =$

h. $[\![\text{Mary}]\!]^f =$

We can compute $[\![\cdot]\!]^f$ compositionally:

(23) **A recursive definition for the computation of focus-semantic values:**

Terminal nodes (TN):

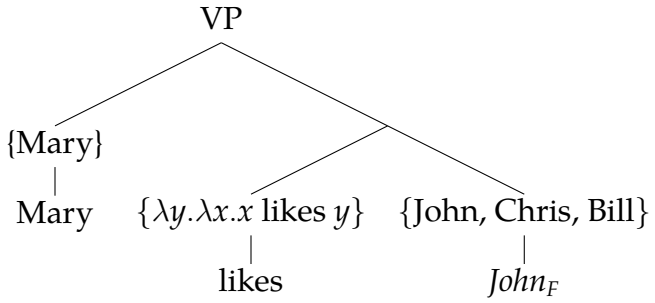
$$[\![\alpha_\tau]\!]^f = \begin{cases} \{[\![\alpha_\tau]\!]\} & \text{if } \alpha \text{ not F-marked} \\ \text{a subset of } D_\tau & \text{if } \alpha \text{ F-marked} \end{cases}$$

Pointwise functional application (PFA):

$$\left[\!\!\left[\begin{array}{c} \alpha_\tau \\ \beta_{\langle\sigma,\tau\rangle} \quad \gamma_\sigma \end{array} \right]\!\!\right]^f = \begin{cases} \left\{ b(g) \mid b \in [\![\beta]\!]^f, g \in [\![\gamma]\!]^f \right\} & \text{if } \alpha \text{ not F-marked} \\ \text{a contextually-determined subset of } D_\tau & \text{if } \alpha \text{ F-marked} \end{cases}$$

Exercise: Compute the focus-semantic value of the following:

(24)

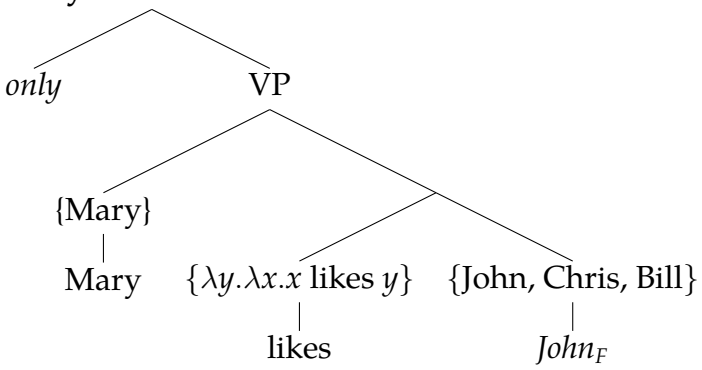


We now have a way of creating the 'relevant set of alternatives' that *only* operates on.

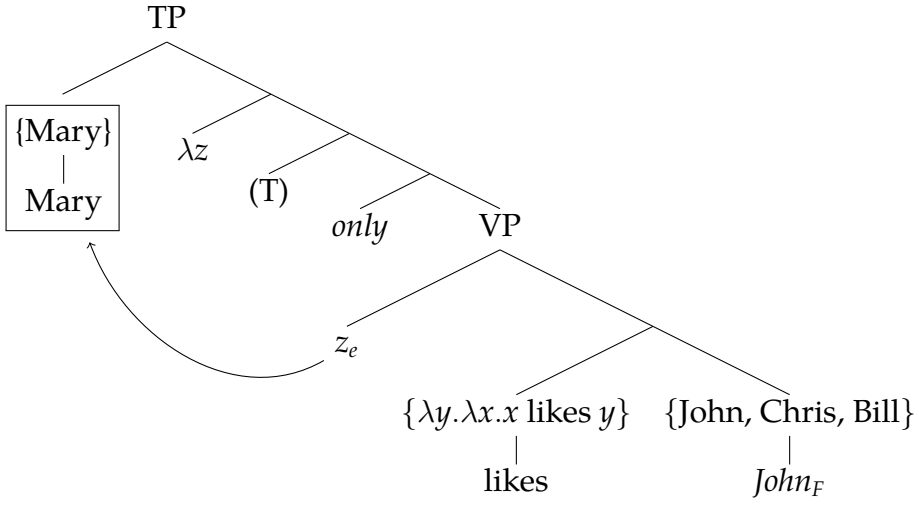
(25) $\llbracket \overbrace{only \quad \alpha} \rrbracket = 1 \iff \forall \phi \in [\![\alpha]\!]^f \left(\phi \neq [\![\alpha]\!]^o \rightarrow \phi \text{ is false}\right)$

Presupposition: $[\![\alpha]\!]^o$ is true

(26) **A toy LF for in-situ focus association:**



(27) **A more realistic LF for in-situ association:**



5 Hamblin (1973): alternatives for in-situ questions

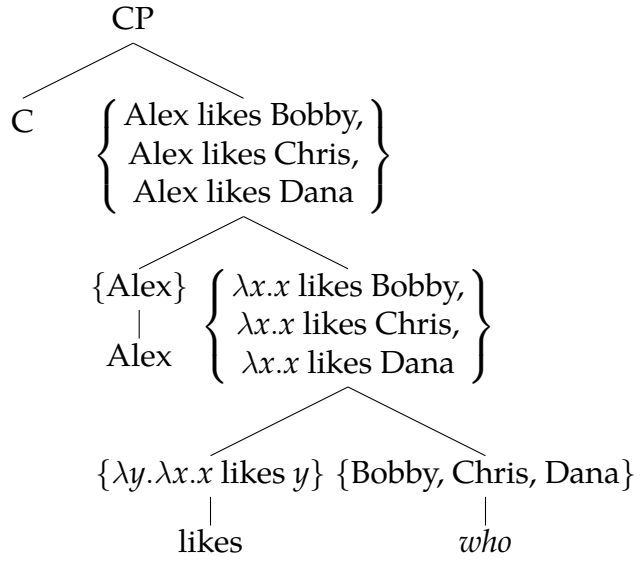
Hamblin (1973) argues quite similarly that alternatives can be used to compute the meaning of a question.[2] *Wh*-phrases denote sets of individuals:

(28) a. **The semantics of *who*:**
Ordinary semantic value: $[\![who]\!]^o$ is undefined
Focus-semantic value: $[\![who]\!]^f = \{x_e : x \text{ is human}\}$

b. **The semantics of *what*:**
Ordinary semantic value: $[\![what]\!]^o$ is undefined
Focus-semantic value: $[\![what]\!]^f = \{x_e : x \text{ is non-human}\}$

"Although standard English word-order places the interrogative word or phrase (or the main one, if there is more than one), first, with inversion of the verb, there is no real need for an order difference from that appropriate to indicatives. So let us assume no special rules about word-order are needed." (Hamblin, 1973, p. 48)

(29) **A toy LF of question interpretation via Rooth-Hamblin alternative computation:**



(30) **Principle of Interpretability (Beck, 2006, p. 16):**
An LF must have an ordinary semantic value.

(31) **The semantics of interrogative C** (Beck and Kim 2006, see also Shimoyama 2001)
$[\![[\text{C TP}]]\!]^o = [\![\text{TP}]\!]^f$

[2] Historical note: Rooth (1985) was not aware of Hamblin (1973) when developing his proposal, see fn 7 in Rooth (1992).

C takes a sister that has a set of alternatives (and no ordinary semantic value) and returns the focus-semantic value of its sister as the ordinary semantic value of the question.

☞ This gives us a set of propositions—the possible answers to the questions—as the denotation of the question.

If this approach to question semantics is correct for English, *wh*-movement is very mysterious. We would have to assume an EPP feature on interrogative C that is responsible for attracting a phrase with a *wh* feature to its specifier.

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