Focus

1 Effects of focus

So far in class we have been studying sentence meaning in relation to syntax, ignoring any effects of the choice of how things are pronounced.[1] But *prosody* seems to have effects on meaning as well.

(1) a. I introduced SUE to Mary.
    b. I introduced Sue to MARY.

The sentences in (1) are truth-conditionally equivalent but get described informally as being different in "emphasis." But this contrast has clear, observable differences too.

(2) *Who did you introduce to Mary?*
    a. I introduced SUE to Mary.
    b. # I introduced Sue to MARY.

(3) *Who did you introduce Sue to?*
    a. # I introduced SUE to Mary.
    b. I introduced Sue to MARY.

We'll return to questions and their answers in a few weeks.

(4) Halliday (1967):
    a. Dogs must be CARRIED.
    b. DOGS must be carried. (cf "Shoes must be worn.)

(5) Rooth (1985):
    a. MARY always takes John to the movies.
    b. Mary always takes JOHN to the movies.

(6) Jackendoff (1972) citing a John Bowers (1969) manuscript:
    a. Of the three men, John hates BILL the most.
    b. Of the three men, JOHN hates Bill the most.

(7) Jackendoff (1972):
    a. Maxwell didn't kill the judge with a silver HAMMER.
    b. Maxwell didn't kill the JUDGE with a silver hammer.

(8) "Focus indicates the presence of alternatives that are relevant for the interpretation of linguistic expressions." — Krifka (2006)

[1] Unless you count ellipsis, which you could think of as a "choice of how things are pronounced."

2 Focus-sensitive adverbs

Certain adverbs must be used together with focus. These include *only*, *even*, *also*.

(9) Alex $\left\{ \begin{array}{c} \text{only} \\ \text{even} \\ \text{also} \end{array} \right\}$ took the TURTLE to school.

(10) Alex $\left\{ \begin{array}{c} \text{only} \\ \text{even} \\ \text{also} \end{array} \right\}$ took the turtle to SCHOOL.

All three of these operators *quantify over alternatives which vary in the focused position*.

(11) Alex took the TURTLE to school.
Prejacent proposition: Alex took the turtle to school.
Focused constituent: turtle
Alternatives to "turtle": frog, pig...
Alternative propositions: Alex took the *frog* to school, Alex took the *pig* to school...

(12) a. *only*:
   i. the prejacent "Alex took the turtle to school" is true
   ii. all the alternative propositions ("Alex took the frog to school," "Alex took the pig to school"...) are false

   b. *even*: the prejacent proposition is "Alex took the turtle to school" was less likely than the alternative propositions, e.g. "Alex took the frog to school," "Alex took the pig to school"..., but the prejacent is nonetheless true.

   c. *also*: at least one of the alternative propositions ("Alex took the frog to school," "Alex took the pig to school"...) is true, and additionally the prejacent "Alex took the turtle to school" is true.

Let's take a closer look at *only*.

3 The meaning of *only*

Horn (1969) gives the first semantic description of *only*. Let x be the focused constituent and f be the predicate corresponding to the rest of the sentence, such that $f(x)$ is the prejacent. (Horn did not use these terms at the time.) Then:

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

Two things to note:

- Horn says the (i) meaning in (12a) is a presupposition, whereas the (ii) meanings are asserted (truth-conditional). This is motivated by data like (14):

  (14) It's *not* the case that [Alex *only* took the TURTLE to school].
  - a. # ...he didn't take the turtle to school.
  - b. ✓ ...he also took the PIG to school.

  The negation in (14) only negated the (ii) meaning. So (14) roughly means:

  (14′) i. Alex took the turtle to school, ← *unaffected by the negation!*
  ii. It's not the case that [Alex did not take the {pig, dog,...} to school].
  $\iff$ Alex did take one of the {pig, dog,...} to school.

- The assertion of *only* is given by Horn as "not > exists":

  $\neg\exists y(y \neq x \wedge f(y))$ "there does not exist a y such that $y \neq x$ and $f(y)$"

  This can be rewritten as "every > not":

  $\forall y(y \neq x \rightarrow \neg f(y))$ "for every y, if $y \neq x$, then $f(y)$ is false"

  We can then further rewrite this as:

  $\forall y(f(y) \rightarrow y = x)$ "for every y, if $f(y)$ is true, then $y = x$"

Note: The relation between the placement of focus and pitch accent (in CAPS) is indirect, so here we will annotate the focused constituent with $[...]_F$. Assume a subpart of the F-marked constituent is prosodically prominent.

4 Computing alternatives

What we want to capture is the following intuition:

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

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

Note that the focused constituent does not have to be of type e.

(17) John *only* $[\text{swims}]_F$.
$\approx \forall Q_{\langle e,t\rangle}$: $Q(\text{John}) = 1 \rightarrow Q = \text{swim}$

In the case of (17), 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 will use the influential *Alternative Semantics* approach of Rooth (1985, 1992). The goal is to build up the 'relevant set of alternatives' compositionally.

(18) **Definitions**:

a. Each node α 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. $[\![\alpha]\!]^o$, the ordinary semantic value, is the value of α that we know and love.

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

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

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

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

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

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

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

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

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

Terminal nodes (TN):

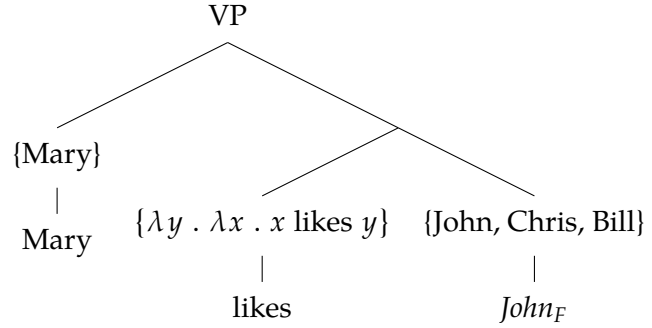
$$[\![\alpha_\tau]\!]^f = \begin{cases} \{[\![\alpha_\tau]\!]\} & \text{if } \alpha \text{ not F-marked} \\ \text{a subset of } D_\tau & \text{if } \alpha \text{ F-marked} \end{cases}$$

Pointwise functional application (PFA):

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

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

(21)



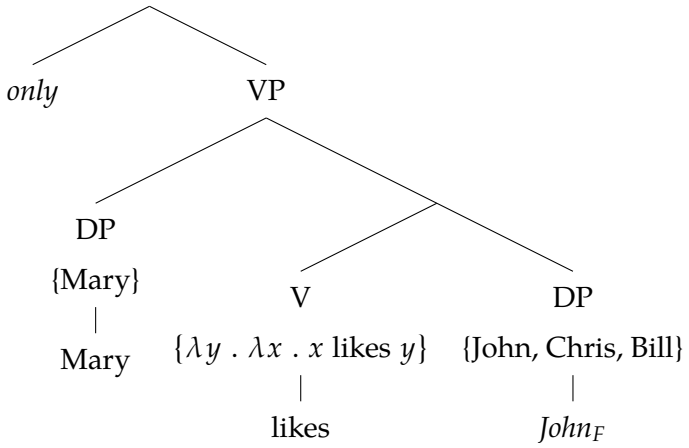
We now have a way of creating the 'relevant set of alternatives' that *only* operates on.

(22) $\left[\!\left[\widehat{\textit{only}\quad \alpha} \right]\!\right] = 1 \iff \forall p \in [\![\alpha]\!]^f \left(p \neq [\![\alpha]\!]^o \rightarrow p = 0\right)$

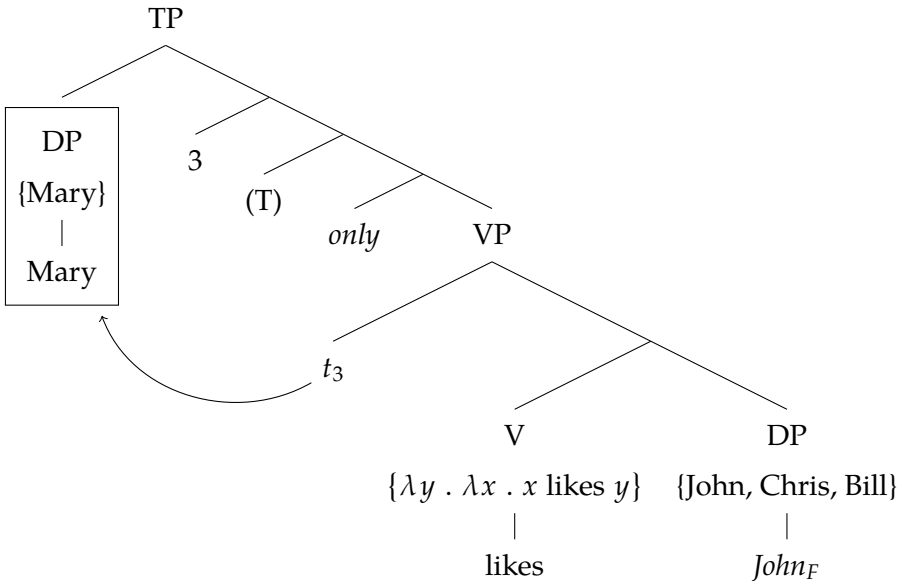
Presupposition: $[\![\alpha]\!]^o$ is true

Interestingly, we cannot define ⟦only⟧ independently and use a rule like Functional Application to derive the meaning in (22). This will be true of all focus-sensitive operators in this system.

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



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



We can also use this approach to compute other focus-sensitive operators, like *also*:

(25) $\left[\!\left[\widehat{\textit{also}\quad \alpha} \right]\!\right] = 1 \iff [\![\alpha]\!]^o = 1$

Presupposition: $\exists p \in [\![\alpha]\!]^f \left[p \neq [\![\alpha]\!]^o \text{ and } p = 1\right]$

(26) a. I also introduced [Sue]$_F$ to Mary.

b. I also introduced Sue to [Mary]$_F$.

(We will discuss *even* in a couple weeks.)

5 Another *only*

There are actually two *only*s in English:

(27) a. I **only** introduced [Sue]$_F$ to Mary. *adverb only*

b. I introduced **only** [Sue]$_F$ to Mary. *constituent only*

Claim: (27a) and (27b) are semantically equivalent.

The two *only*s differ in where their focus can be:

(28) a. ✓ I **only** introduced Sue to [Mary]$_F$.

b. * I introduced **only** Sue to [Mary]$_F$.

(29) a. ✓ **Only** [John]$_F$ introduced Sue to Mary.

b. * **Only** John introduced [Sue]$_F$ to Mary.

Two approaches:

1. There is just one *only* in English. We should be able to unify the two uses in some way.
2. There are two *only*s in English. It's just an accident that they are pronounced the same.

   Cross-linguistic evidence: There are some languages where the two *only*s are pronounced differently, e.g. Vietnamese *chi* vs *moi* (Hole, 2013).

Taking the second approach, we could define a kind of quantifier *only* as follows:

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

[*Only* DP] will then have to QR if it is in non-subject position.

6 Taglicht (1984) ambiguities

Taglicht (1984) shows that constituent *only* in non-subject position introduces scope ambiguities:

(31) I knew (that) he had learnt [*only* [Spanish]$_F$] (Taglicht, 1984, p. 150)

a. knew > *only*:
   I knew he *hadn't* learnt any other language.

b. *only* > knew:
   I *didn't* know he had learnt any other language.

(32) We are required to study [*only* [syntax]$_F$]. (Rooth, 1985, p. 90)

a. required > *only*:
   We are required to *not* study {semantics, phonology,...}.
   $\Longleftrightarrow$ we are not allowed to study {semantics, phonology,...}.

b. *only* > required:
We are *not* required to not study {semantics, phonology,...}.

Recall that quantifiers could theoretically QR to different heights (always adjoining to a propositional node—type t) and that this could be the source of scope ambiguities. We can model the ambiguities above in this way.
Two things to note:

- For regular quantifiers, it is generally believed that QR cannot escape finite clauses.

  (33) * A different student thought/knew [$_{CP}$ that he had studied every language].

  (34) ✓ A different student is required [$_{\text{nonfinite}}$ to study every language].

  If the wide-scope reading of *only* in (31) is due to QR of the *only*-phrase, this QR would be exceptional in some way.

- The ambiguities above (and other examples given by Taglicht and Rooth) all have an *only*-phrase in non-subject position. Bayer (1996, pp 59–61) claims that *only* on subjects of finite clauses do not lead to these types of ambiguities, and instead only have surface scope.

  (35) ***Only* on subjects of finite clause embeddings do not take wide scope:**
  They believe [(that) *only* [John]$_F$ is stupid].
  a. ✓ believe > *only*:
  They believe that {Mary, Sue,...} are *not* stupid.
  b. * *only* > believe:
  They do not believe that {Mary, Sue,...} are stupid.

  An interesting possibility is that this is because an *only*-phrase in subject position does not need to QR for type reasons, *therefore it cannot QR at all*. However, this doesn't seem to be the general solution. *Only* on subjects of nonfinite clauses (ECM embeddings and small clauses), which (probably) don't have to QR for type reasons, is able to take wide scope:

  (36) ***Only* on subjects of nonfinite embeddings can take wide scope:** (Bayer, 1996, p. 60)
  a. They find [*only* [John]$_F$ stupid].
  b. They believe [*only* [John]$_F$ to be stupid].

  (Bayer (1996) attributes this difference to the ECP.)

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