

Unifying focus (Rooth, 1992)¹

1 Focus in Rooth (1985)

Rooth (1985) gave a semantics for adverb *only* which allows focus to be interpreted in-situ. We saw the following denotation for *only* when we talked about Rooth (1985) before:

$$(1) \llbracket \textit{only} \rrbracket = \lambda P_{\langle e,t \rangle} . \lambda x_e . [\forall Q_{\langle e,t \rangle} [Q(x) \ \& \ C(Q)] \rightarrow Q = P]$$

But actually what Rooth (1985) does is a bit more complicated:

(2) **Translation rule for *only* (Rooth, 1985, p. 59):**

[*only* VP] has the translation:

$$R(C, VP', \lambda x \forall P [[P\{x\} \ \& \ C(P)] \rightarrow P = \wedge VP'])$$

where R evaluates the last argument (the definition of *only* proper) using a variable C set to be (the characteristic function of) the focus-semantic value (the "p-set," in Rooth 1985 terms) of VP' .

Rooth (1985) called this the "domain selection theory" of *only*.

"In one sense, (2) is unnecessarily complex, in that a variable C which always becomes bound is introduced. I retained C because I find the possibility that association with focus has something to do with a general phenomenon of selecting domains of quantification interesting." (Rooth, 1985, p. 59)

The intuition here is that the relation between the domain C and the placement of focus could (perhaps) also be used for other phenomena, besides the interpretation of focus-sensitive adverbs.

Rooth (1992) develops this intuition. Rooth (1992) is the source of "focus semantic value," evaluated using $\llbracket \cdot \rrbracket^f$ and "ordinary semantic value" using $\llbracket \cdot \rrbracket^o$, and also popularized the term "Alternative Semantics" (credited to von Stechow 1989).

¹Based in part on a handout by Luka Crnić.

2 Focus-related effects

Rooth (1992) attempts to unify the effect of focus in a variety of linguistic contexts.

2.1 Focussing adverbs

- (3) a. Mary *only* introduced [Bill]_F to Sue.
 b. Mary *only* introduced Bill to [Sue]_F.
- (4) a. [_S Mary *only* VP]
 b. $\forall P[P \in C \wedge P(\text{Mary}) \rightarrow P = VP']$
- (5) “The role of focus is to identify the set C serving as a domain of quantification: the variable is set equal to the focus semantic value of VP.”
 a. $\llbracket [VP \text{ introduced } [Bill]_F \text{ to Sue}] \rrbracket^f = \{\lambda x[\text{introduce}(x, y, \text{Sue})] \mid y \in D_e\}$
 b. $\llbracket [VP \text{ introduced Bill to } [Sue]_F] \rrbracket^f = \{\lambda x[\text{introduce}(x, \text{Bill}, z)] \mid z \in D_e\}$

But there are cases where C should not be the entire focus-semantic value, as determined by the domain of semantic values of the appropriate type.

- (6) Mary *only* [read]_F The Recognitions.

“Read” is a relation of type $\langle e, \langle e, t \rangle \rangle$. Other relations of this type can include:

- (7) “the relation which holds between x and y exactly if x was born in the same millennium as the author of y , and even trivial relations such as the one which holds between any x and any y .” I.e.:
 a. $\lambda y. \lambda x. x$ was born in the same millennium as the author of y
 b. $\lambda y. \lambda x. \text{true}$

If C ranges over all such relations, the truth-conditions of *only* would never be satisfied.

- (8) **Focus adverb constraint:**
 If C is the domain of quantification of a focusing adverb with argument α , then $C \subseteq \llbracket \alpha \rrbracket^f$.

The exact value of C will be determined by context.

(Note that there are actually two kinds of problems in (7) above. (7a) is an “irrelevant” predicate. Intuitively, in most contexts, we do not want the truth conditions of (6) to be dependent on the evaluation of (7a). This is different from (7b), which will always be true. For the latter, we might imagine modifying *only* to deal with such alternatives that are entailed by the prejacent.)

2.2 Contrast

There are, of course, other uses of focus.

(9) **Suggested contrasts:**

in my_F opinion, in the old_F days, in this_F country...

(10) **Symmetric contrasts:**

a. An American_F farmer met a Canadian_F farmer... [insert joke here]

b. John_F hit Bill_F and then he_F hit him_F. (Ladd 1980)

One might imagine that “a CANADIAN farmer” in (10a) is so pronounced because “farmer” is given, and therefore destressed. However, this view doesn’t explain the focus placement in “an AMERICAN farmer,” because “farmer” isn’t “given” at this point.

☞ Instead, the placement of focus in (10a) must be due to a notion of contrast.

(11) **Contrasting phrase constraint:**

If a phrase α is construed as in contrast with a phrase β , then $[[\beta]]^o \in [[\alpha]]^f$.

Crucially, the idea is that [_{DP} an American farmer] is in contrast to [_{DP} a Canadian farmer].

This is able to get some neat effects, with a tweak (fn. 4):

(12) [_{β} John₁ called Mary₂ a Republican], and then [_{α} she_{2,F} insulted him_{1,F}].

(13) Assume $D_e = \{\text{John, Mary, Bill}\}$

a. $[[\beta]]^o = 1 \iff \text{John called Mary a Republican}$

b. $[[\alpha]]^f = \left\{ \begin{array}{l} 1 \iff \text{John insulted Mary,} \\ 1 \iff \text{John insulted Bill,} \\ 1 \iff \text{Mary insulted John,} \\ 1 \iff \text{Mary insulted Bill,} \\ 1 \iff \text{Bill insulted John,} \\ 1 \iff \text{Bill insulted Mary} \end{array} \right\}$

c. Contrast condition requires $(1 \iff \text{John called Mary a Republican}) \in [[\alpha]]^f$

Strictly speaking, “John called Mary a Republican” ($[[\beta]]^o$) is not in $[[\alpha]]^f$. The contrast condition (11) is satisfied in (12) if we assume “John called Mary a Republican” \iff “John insulted Mary.” But this biconditional might be too strong.

Idea: Perhaps it’s licensed here under *entailment*:

$(1 \iff \text{John called Mary a Republican}) \Rightarrow (1 \iff \text{John insulted Mary}) \in [[\alpha]]^f$

2.3 Scalar implicature

(14) How did the exam go?

a. Well, I passed_F.

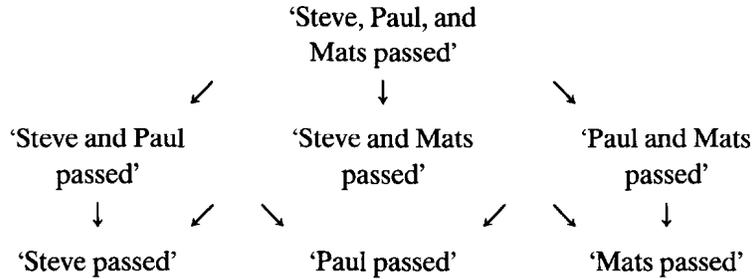
$\sim \neg(\text{I aced})$

Scale: 'I aced' \rightarrow 'I passed'

b. Well, I_F passed.

$\sim \neg(\text{Steve passed}), \neg(\text{Paul passed}), \neg(\text{Steve and I passed}), \dots$

Scale:



The scalar implicature negates stronger alternatives on a relevant scale, the set of *scalar alternatives*. Where does the scale come from?

(15) **Constraint on scales:**

If C is the underlying set of a scale used in computing the implicatures of a sentence α , $C \subseteq \llbracket \alpha \rrbracket^f$.

2.4 Questions and answers

(16) Q: Who cut Bill down to size?

a. Mary_F cut Bill down to size.

b. # Mary cut Bill_F down to size.

(17) Q: Who did Mary cut down to size?

a. # Mary_F cut Bill down to size.

b. Mary cut Bill_F down to size.

“We might say that the function of focus in an answer is to signal other propositions which are potential answers in the context of the question.”

(18) **Question-answer constraint:**

In a question-answer pair $\langle Q, \alpha \rangle$, $\llbracket Q \rrbracket^o \subseteq \llbracket \alpha \rrbracket^f$.

Here $\llbracket Q \rrbracket^o$ is defined as the set of possible answers, i.e. the Hamblin (1973) semantics for the question.

3 Focus interpretation principle

We've seen four different constraints on the use of focus, abbreviated here:

(19) **Constraints on focus:**

a. Focus adverb constraint: $C \subseteq \llbracket \alpha \rrbracket^f$ (8)

b. Contrasting phrase constraint: $\llbracket \beta \rrbracket^o \in \llbracket \alpha \rrbracket^f$ (11)

c. Constraint on scales: $C \subseteq \llbracket \alpha \rrbracket^f$ (15)

d. Question-answer constraint: $\llbracket Q \rrbracket^o \subseteq \llbracket \alpha \rrbracket^f$ (18)

The Focus Interpretation Principle attempts to unify these different uses of focus:

(20) **Focus Interpretation Principle (basic version, p. 86):**

In interpreting focus at the level of a phrase α , add a constraint that:

a. $\Gamma \subseteq \llbracket \alpha \rrbracket^f$ or *contrast set*

b. $\gamma \in \llbracket \alpha \rrbracket^f$ *contrast individual*

Γ is a variable with the type of a set of objects matching α in type, and γ is a variable matching α in type.

Rooth takes it a step further to make focus-sensitivity (having a semantics that cares about a Γ or γ) a lexical property of one particular operator \sim . People call this the "squiggle."

(21) **Focus Interpretation Principle (formal, squiggle version, p. 93, 95):**

Adjoin an operator $\sim v$ to a phrase α in LF, where v is a variable with either the same type as α (individual case), or the type of a set of objects with the same type as α (set case).

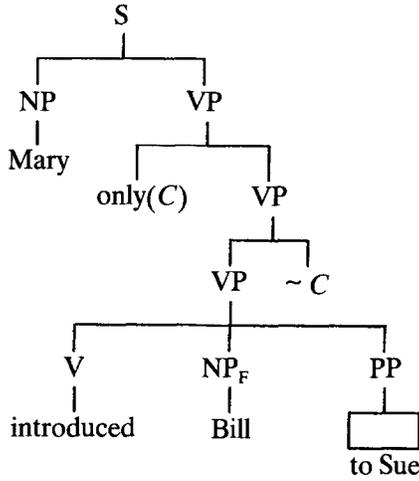
set case: $\alpha \sim \Gamma$ presupposes that Γ is a subset of the focus semantic value of α and contains both the ordinary semantic value of α and an element distinct from the ordinary semantic value of α .

individual case: $\alpha \sim \gamma$ presupposes that γ is an element of the focus semantic value of α distinct from the ordinary semantic value of α .

Two additional notes on how to interpret \sim :

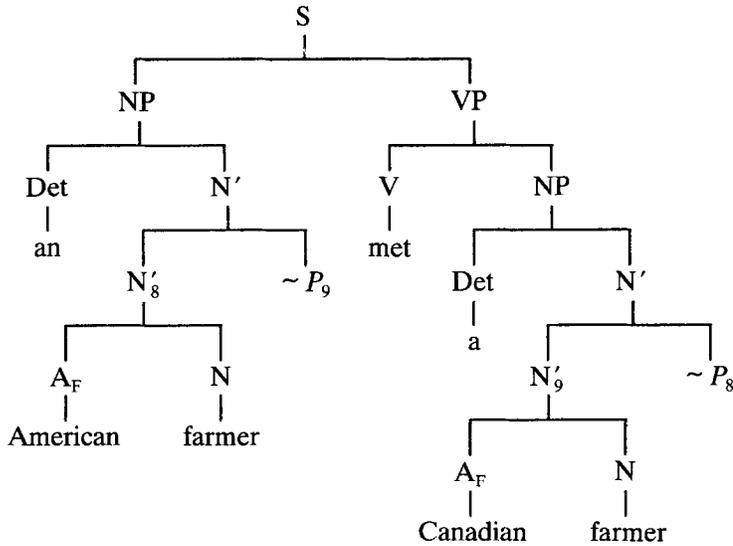
- "First, it is a purely presuppositional operator: the assertion of $\alpha \sim v$ is the assertion of α ." (p. 94)
- "Second, in the expression $\alpha \sim v$, focus has been interpreted, so we want to neutralize the semantic effect of the foci in α . In alternative semantics, the focus semantic value of a phrase containing no foci is the unit set of its ordinary semantic value, so the way to state this closure clause is: $\llbracket \alpha \sim v \rrbracket^f = \{ \llbracket \alpha \rrbracket^o \}$ (p. 94–95)

(3a) Mary *only* introduced Bill_F to Sue.



(22) $C \subseteq \{\lambda x.x \text{ introduced } y \text{ to Sue} \mid y \in D_e\}$

(10a) An American_F farmer met a Canadian_F farmer.



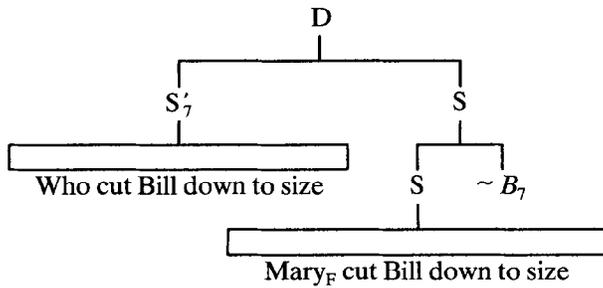
(23) a. $P_9 = \llbracket \text{Canadian}_F \text{ farmer} \rrbracket^o \in \llbracket \text{American}_F \text{ farmer} \rrbracket^f$
 b. $P_8 = \llbracket \text{American}_F \text{ farmer} \rrbracket^o \in \llbracket \text{Canadian}_F \text{ farmer} \rrbracket^f$

(14) a. Well, I passed_F.
 b. Well, I_F passed.

(24) a. $[_S [_S \text{ I passed}_F] \sim C]$.
 b. $[_S [_S \text{ I}_F \text{ passed}] \sim D]$.

(25) a. $C \subseteq \llbracket \text{I passed}_F \rrbracket^f = \{P(\text{Mats}) \mid P \in D_{\langle e,t \rangle}\}$
 b. $D \subseteq \llbracket \text{I}_F \text{ passed} \rrbracket^f = \{\text{pass}(x) \mid x \in D_e\}$

- (16) a. *Who* cut Bill down to size?
 b. $Mary_F$ cut Bill down to size.



- (26) $B = \llbracket \text{Who cut Bill down to size} \rrbracket^o = \{ \text{cut-down-to-size}(x, \text{Bill}) \mid x \in D_e \wedge \text{person}(x) \}$
 $\subseteq \llbracket \text{Mary cut Bill down to size} \rrbracket^f = \{ \text{cut-down-to-size}(x, \text{Bill}) \mid x \in D_e \}$

4 Constraints on Focus Interpretation

- (27) **The theory of focus (p. 95):**
- Rules describing the phonological interpretation of the feature F.
 - Two-dimensional alternative semantics, defining focus semantic values with reference to F and ordinary semantic values.
 - The semantic clauses for \sim .
 - The rule introducing \sim in LF.

Additionally, in the last section of the paper, the option of allowing particular lexical items (e.g. *only*, which is obligatorily focus-sensitive) to select for \sim is considered.

- (28) **Negative syntactic constraint:**
 No rules other than (27a–b) refer to the focus feature.
- (29) **Negative semantic constraint:**
 No rules other than (27b–c) refer to the focus semantic value.

One important consequence: this rules out rules like:

- (30) “In LF, *only* must be the sister of a phrase bearing the focus feature F.” (p. 96)

☞ This disallows probing for and moving focused constituents. (Although see discussion of caveats.)

5 Bare remnant ellipsis and the focus effect

A certain class of ellipsis constructions seem to be focus-sensitive. The underlined Sue is the “remnant,” and the corresponding constituent is the “correlate.”

(31) **Comparatives with phrasal standards:**

- a. She beats me_F more often than Sue.
 - i. = than she beats Sue
 - ii. \neq than Sue beats me
- b. She_F beats me more often than Sue.
 - i. \neq than she beats Sue
 - ii. = than Sue beats me

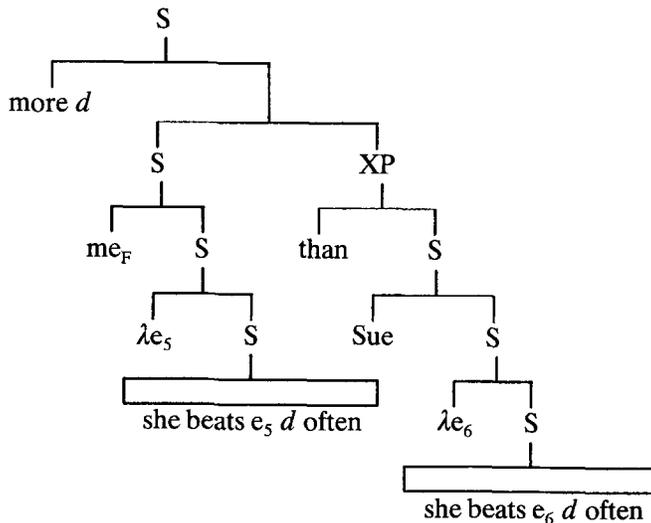
(32) **Stripping:**

- a. She likes me_F , but not Sue.
- b. She_F likes me, but not Sue.

The observation is that the correlate is always the focused constituent. The elided part is a predicate derived by abstracting over the correlate in the antecedent clause.

One way to do this is to move the correlate and to construct parallel predicates (Sag, 1976):

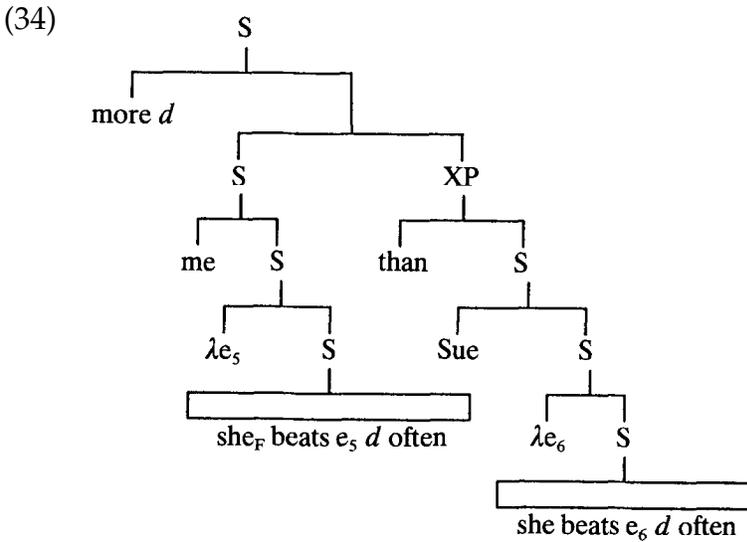
(33) **Tree for (31a):**



Does “ me_F ” move up here because it is focused? Rooth says **no**. Again, his focus theory (27) says there is no such general process.

Claim: We can already get this effect from constraints already observed.

Consider the following hypothetical tree for the ungrammatical (31bi):



This structure satisfies the constraint for ellipsis to find an antecedent. However, it will violate the constraint on contrast, as we see from the non-ellided variant:

- (35) * She_F beats me more often than she beats Sue.
- a. more *d* [_α she_F beats me *d*-often] [_β she beats Sue *d*-often]
 - b. [[α]^f ⊈ [[β]^f

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