

# ***Only* a matter of context?**

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## *0. Introduction*

In this paper the VP-modifier *only* and the determiner *only* are examined in order to see what the exact role of focus and context in the determination of the quantificational structure of *only* is.<sup>1</sup>

## *1. Only: associated with focus?*

In the literature *only* is known as a *focus adverb* or *focus operator*, due to the fact that *only* is usually associated with focus, as in the famous examples of Rooth (1985):

- (1) a Jane only introduced [Carol]<sub>F</sub> to Robert
- b Jane only introduced Carol to [Robert]<sub>F</sub>

In the above sentences we can witness a difference in truth conditions that seems to be associated with focus. In a situation in which Jane introduced Carol to Robert and Jacky, and there were no other introductions, sentence (1a) will be true, whereas (1b) will be false.

Yet, Vallduví (1990) shows that *only* does not have to be associated with focus. The truth-conditional difference between (1a) and (1b) does not necessarily depend on focus, but rather on what is considered the semantic argument of *only*. In most cases focus will indicate what is the argument of *only*, but not always. Suppose we supply the following context: I know that Jane introduced Carol and Jacky to Peter and that Jane introduced Carol (but not Jacky) to someone, but I do not know who is this someone. In this context I can ask: Who did Jane only introduce [Carol]<sub>F</sub> to, and the answer will be (1b) rather than (1a). So, *only* will then be associated with *Carol*, in the sense that Jane introduced only Carol and noone else to Robert, although *Robert* is the element in focus.

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<sup>1</sup> I benefited a great deal from discussions with the participants in the seminar on 'Topic and Focus' in Groningen, fall 1994, and in the 'Quantification and Focus' class at the LOT-Winterschool in Tilburg, January 1995. Section 4 is based on joint work with Jaume Solà. I thank Sjaak de Mey, Henriëtte de Swart, Enric Vallduví, an anonymous reviewer and the editors of this volume for comments on earlier versions of this paper.

then be associated with *Carol*, in the sense that Jane introduced only Carol and noone else to Robert, although *Robert* is the element in focus.

Vallduví provides more examples in which *only* is associated with an argument that is not in focus (in the following examples the argument associated with *only* is given in italics):

- (2) a Jane and Jacky know the Amazon quite well but only *Jane's* been to the [cities]<sub>F</sub> in Brazil
- b A: When we were in China, we only lived on rice  
        B: Boy, I'm glad I wasn't there. I'm not finicky, but only *on rice* [I couldn't live]<sub>F</sub>
- c It's [Jane]<sub>F</sub> who eats only *rice* (cf. Horn 1969)
- d [Liver]<sub>F</sub>, I would only eat *if I had to*

In each of the above cases, the constituent that is associated with *only* is not the constituent that is in focus. Therefore, examples like these support Vallduví's position that focus is a real information-packaging primitive that has no place in semantics. In Vallduví's framework, the focus of each sentence is the only informative part of the sentence, i.e., the only contribution to the hearer's knowledge-store at the time of utterance (or so the speaker assumes). Indeed, focus indicates what is the new information in the examples above, and not what is the argument of *only*. Yet, one gets the impression that in the kind of contexts as exemplified under (2), the semantic argument of *only* can be derived from the previous discourse, so that focus might have played its part in *only*'s argument selection in an earlier stage already. Partee (1994) refers to this type of examples as *second occurrence expressions*, which seems descriptively adequate. The explanation could be that in case the argument of *only* has already been established by means of focus in the previous discourse, this argument can be inherited and the repeated element in focus gets deaccented because of the repetition.

However, this explanation cannot be maintained with respect to the following example, also taken from Vallduví (1990):

- (3) A: I'm glad you could come for dinner. Had I known before, I wouldn't have made pig's feet
- B: I love pig's feet. It's my [sister]<sub>F</sub> who only eats *prime cuts*

Example (3) is felicitous in a context where the host knows that one of the guest's family members eats only prime cuts, and there need not be an explicit mention of *only*'s nonfocal partner in the previous discourse. Note that what is important, though, is that out of a set of alternatives, my sister only eats prime cuts. That is, it should be excluded that she eats pig's feet as well.

I therefore conclude, in accordance with Vallduví (1990), that the semantics of *only* is in principle independent of focus, despite the strong tendency to associate *only* with the element in focus. Under contextual pressure (either at sentence level or at discourse level) focus may cease to function as a guide in determining the argument of *only*. Yet, what can be maintained is that without any further context, focus can be a useful tool in finding the set of alternatives that is somehow part of the argument structure of *only*. I will therefore turn to the role of alternatives in the semantics of the VP-modifier *only*.

## 2. *Only and the role of alternatives*

In Rooth's (1985, 1992) *alternative semantics*, syntactic phrases do not only get an ordinary semantic value, but also a second semantic value, which is called the *focus semantic value* of the phrase. This focus semantic value can be computed mechanically. That is, the focus semantic value of a phrase  $\alpha$  is a set of alternatives of the same type as  $\alpha$ , from which the ordinary semantic value of  $\alpha$  is drawn. The ordinary semantic value of  $\alpha$  is always an element of the focus semantic value of  $\alpha$ . The focus semantic value of a phrase  $\alpha$  that is not in focus is the singleton set containing as its unique element the ordinary semantic value of  $\alpha$ . Informally, the focus semantic value for a proposition is the set of propositions obtainable from the ordinary semantic value by making a substitution in the position corresponding to the focussed phrase. For example, the focus semantic value of (4) is the set of propositions of the form ' $x$  swims'. Rooth treats *only* as a VP-modifier that quantifies over properties. Consider (5a) and (b):

- (4) [Jane]<sub>F</sub> swims
- (5) a Jane *only* VP
- b  $\forall P [P \in C \ \& \ P(j) \rightarrow P = VP]$

So, in a sentence like (5a) *only* quantifies over properties  $P$  as in (5b): for all properties  $P$  in a certain set of properties  $C$  such that Jane has the property  $P$ , it holds that this property  $P$  is identical to the property expressed by the VP. In Rooth (1985), the role of focus was to identify the *C-set* that serves as the domain of quantification of *only* in (5b). This works pretty well for examples as in (1): the focus semantic value of the VP [*introduced* [Carol]<sub>F</sub> to Robert] in (1a) is the set of properties of the form '*introduce  $x$  to Robert*' and so, the quantification in (1a) can be rendered as: for all properties of the form '*introduce  $x$  to Robert*' that Jane has, it holds that this property is identical to the property denoted by the VP *introduce Carol to Robert*. This excludes the possibility of Jane having the property *introduce Jacky to Robert* in (1a), which seems to be the

right result. But now consider the following sentence, also discussed by Rooth (1985), where the entire VP is focussed:

- (6) Jane only [swims]<sub>F</sub>

If we say here that for all properties that Jane has and that are of the same semantic type as *swim*, it holds that this property is identical to the denotation of *swim*, then this sentence will always come out as false, since Jane definitely has properties other than *swim*, such as *breathe*, *live somewhere*, *be<sup>e</sup> Jane*, *being called Jane*, and so forth. In order to avoid this kind of problem, we need a contextually relevant set of properties (e.g., the set of properties which are exercise activities). In Rooth (1992) the view is taken that the focus semantic value of a phrase cannot *identify* the C-set but it can still be used to *constrain* this C-set, leaving room for a pragmatic process to add further information. Therefore, a requirement is added to (5) that *C* be a subset of the focus semantic value of the VP (cf. Rooth 1992):

- (5) a Jane only VP  
       b  $\forall P [P \in C \ \& \ P(j) \rightarrow P = VP]$   
 (7) Focus-determined constraint:  $C \subseteq \llbracket VP \rrbracket^f$

Blok and De Mey (1991) and Blok (1992, 1993) argue that since context eventually has to give you the relevant set of properties of which only one is true for Jane in (5), the computation of the focus semantic value of the VP has become vacuous. Furthermore, in the previous section we concluded that focus effects with respect to *only* are in principle optional, but what is not optional is that we need a certain contextually given set of alternatives to get the right interpretation for sentences containing *only*. This would mean that sets of alternatives are in principle independent of focus.

To sum up the discussion so far, the semantics of *only* requires a contextually given set of alternatives and generally, focus helps to restrict the relevant C-set. In fact, although the C-set may be provided by the context independent of the focus structure of the sentence, I would like to maintain that in absence of a given context, people tend to make use of (default) focus structure to get a proper set of alternatives as an argument for *only*.

Some evidence that appears to support this claim can be obtained from a sentence-processing experiment reported in Ni and Crain (1990). In Ni and Crain (1990) a difference in *garden path* effect is measured (in reaction times) between sentences that contain a definite subject NP and those containing *only* as a determiner in subject position.

- (8) The students furnished answers before the exam received high marks
- (9) Only students furnished answers before the exam received high marks
- (10) Only dishonest students furnished answers before the exam received high marks

As expected on the ground of similar experiments reported in the literature (see Ni and Crain for references), sentence (8) with a definite subject gives rise to a garden path effect, but (9), where the focus operator *only* is in initial position, does not: apparently, the crucial phrase *furnished...exam* is welcomed as a modifying clause. The most interesting case is provided by (10), where adding the adjective *dishonest* as an extra modifier in fact cancels this effect: here a garden path effect is observed again, just like in (8).

Ni and Crain argue as follows: *only* creates a set of alternatives (they use the term *contrast set* and do not refer to Rooth (1985) or any related literature in that area) and in (9) this set might contain teachers, parents, etc., but an easier way to create such a set is to split up the set of students already given by the noun; a modifier can be used to do so. In (9) the relative clause is used in that way, but in (10) the adjective *dishonest* already functions that way, hence the ambiguous phrase gives rise to a garden path again. The explanation is based on a *least effort* principle that people should handle when they try to understand sentences outside of context by actively creating a mental context. In my opinion, Ni and Crain's analysis is in accordance with our conclusion that focus usually functions as a guide in constructing the right argument set for *only* from the context. That is, out of the blue, one tends to give the sentences in (9)-(10) a focus-structure as in (11)-(12).

- (11) Only students [furnished answers before the exam]<sub>F</sub> received high marks
- (12) Only [dishonest]<sub>F</sub> students furnished answers before the exam received high marks
- (13) Only dishonest students [furnished answers before the exam]<sub>F</sub> received high marks

Again, context could override this default focus structure such that if the discussion would already be about dishonest students in general, then we would expect a focus structure as in (13) and accordingly, no garden path effect anymore. In the rest of this paper it should become clear in what way focus can be used to restrict the set of alternatives that is part of the argument structure of *only* in sentences such as (12)-(13). But first of all I must briefly go into the status of *only* as a determiner.

### 3. Focus and alternatives in the case of *only* as a determiner

As became clear in the previous section, Rooth (1992) treats *only* as a VP-modifier quantifying over properties and claims that the role of focus is to constrain the set *C* (rather than fixing it uniquely) serving as the domain of quantification for *only*. So far, I have deliberately avoided to use the term *domain of quantification* for the argument of *only* that is identified with the C-set. In order to see why, compare (14) to (6), repeated for convenience:

- (14) Jane always [swims]<sub>F</sub>  
 (6) Jane only [swims]<sub>F</sub>

I take quantificational adverbs to denote two-place relations between sets of events (following De Swart 1991). *Always* denotes a subset relation. Syntactically, however, only one argument (the main clause) is available in (14) and this will become the second argument (nuclear scope) of the quantifying adverb. Focus can help to determine the first argument set, which will most naturally be the set of events in which Jane does something, where this something refers to a relevant set of alternatives to the activity of swimming. So, we get the following interpretation for (14): the set of events in which Jane does something (out of a set of relevant activities) is a subset of the set of events in which Jane swims.

Semantically, *only* also denotes a two-place relation, but in a sense it is the converse of *always* in that it denotes the superset relation (cf. De Mey 1991, Blok and De Mey 1991). Note, however, that we take the sentence adverb *always* to denote a relation between sets of events, whereas *only* as a VP-modifier is considered to relate sets of properties. It will be clear from Rooth's translation in (5b) of sentences like (6) that the arguments of *only* are reversed in the representation of the quantification. This is due to the fact that the universal quantifier is used, which is semantically the converse of *only*. So, the only syntactic argument of *only* in (6), namely the VP, ends up in the second argument of the universal quantifier, and the C-set which has to be provided by the context with a helping hand of focus, ends up in the first argument and is therefore referred to by Rooth as the domain of quantification of *only*. If we choose a representation of the quantificational structure in (6), however, representing the meaning of *only* as a generalized quantifier *ONLY*, then the ordinary semantic value of the VP will end up in the first argument set of the quantifier (the domain of quantification or the restrictor) and the C-set will end up as the second argument set of *ONLY*, the nuclear scope (cf. Blok and De Mey 1991). Both analyses yield equivalent results, but what is important is that in case of just one syntactic argument focus can function as a guide in determining the *first* argument set of adverbs of quantification, whereas it can function as a guide in determining the *second* argument set of *only*, which thus formulated is a piece of evidence against the

idea of a generalized correlation between the first argument set of a quantifier and the focus in a sentence (as explored by e.g., Partee 1991).

If we wish to maintain the generalization that focus can contribute to the determination of the domain of quantification of all quantifiers, however, we have to argue that in the case of *only*, it is the second argument that functions as the domain of quantification. I will now show that this can be well done if we define the domain of quantification as the set the quantifier lives on.

If we consider *only* in determiner position, we can define *only* as a determiner that denotes the superset relation between sets of individuals, as such being the converse of *all* (cf. De Mey 1991):

- (15) a Only linguists drink  
b All linguists drink

- (16) a  $only_E AB$  iff  $A \supseteq B$   
b  $all_E AB$  iff  $A \subseteq B$

So, if the arguments of determiners are purely provided by the syntax, in such a way that in the sentences in (15), the denotation of the noun *linguists* will provide the first argument set  $A$ , and the denotation of the VP *drink* ends up as the second argument set  $B$ , then according to the definitions in (16), (15a) will be true if the set of linguists is a superset of the set of drinkers (that is, there are no individuals in the set of drinkers that are not in the set of linguists), and (15b) will be true if the set of linguists is a subset of the set of drinkers (which means that there are no individuals in the set of linguists that are not in the set of drinkers).

In the literature, the status of *only* as a determiner in sentences like (15a) has been denied mainly because *only* does not obey *Conservativity*, which is considered a basic property of determiner denotations in natural language:

- (17) CONSERVATIVITY:  $D_E AB$  iff  $D_E A(A \cap B)$

In (18) the reader can check that *all* is conservative, but *only* is not:

- (18) a Only linguists drink  $\nrightarrow$  Only linguists are drinking linguists  
b All linguists drink  $\leftrightarrow$  All linguists are drinking linguists

Barwise and Cooper (1981) use the notion *live on* for the property of Conservativity: they say that determiners live on their first argument set  $A$ . As De Mey (1991) points out, although *only* is not Conservative at first sight, it does live on a set, namely its second argument set  $B$ . What is generally called *Conservativity*

is called *R-Conservativity* by De Mey: *only* is not R-conservative, but it does obey *L-Conservativity*, which is a related property:

- (19) a L-CONSERVATIVITY:  $D_E AB$  iff  $D_E(A \cap B)B$   
 b Only linguists drink  $\Leftrightarrow$  Only drinking linguists drink  
 c All linguists drink  $\nLeftrightarrow$  All drinking linguists drink

I refer to De Mey (1991) and Klein (1994) for more details and discussion on the semantic characteristics of the determiner *only*.

The reader might wonder what has become of the sets of alternatives that played such an important role in providing a second argument set for the VP-modifier *only*. At first sight, one might think that we do not need sets of alternatives at all in the case of determiner quantifiers. The argument sets of the determiner *only* in (15a) are syntactically given by the noun and the VP, in the same compositional way as with other determiners. Yet, the following examples show that focus can give rise to a truth conditional effect in case of determiner *only* as well:

- (20) a Only [lazy]<sub>F</sub> linguists drink  
 b Only lazy [linguists]<sub>F</sub> drink  
 c Only [lazy linguists]<sub>F</sub> drink

In a situation where apart from lazy linguists also several lazy paleontologists drink and nobody else drinks, sentence (20a) will be true, but (20b) obviously false. Intuitively, the difference lies in the sets of alternatives that are involved in the quantification. In (20a) *only* seems to quantify over linguists of all kinds, in (20b) over lazy individuals. In the example (20c) we get the traditional result that compositionality would predict in which *only* quantifies over lazy linguists, such that the set of drinking individuals that are not lazy linguists should be empty. In order to account for these observations with respect to the determiner *only*, I will now turn to a formal account of the role of alternatives in the quantificational structure of determiners in general, developed by De Hoop and Solà (in prep.), and then explain the exceptional but entirely expected behaviour of *only*.

#### 4. Determiners, context sets, and focus

In De Hoop and Solà (in prep.) it is argued that the generalized union over the C-set, the set of alternatives, of a focussed constituent can be used to spell out the context set variable that is always part of the first argument of a determiner. In sentences such as (21) it seems pretty clear that the first argument set of the determiner *most* has to be contextually determined in one way or another, since it is not given by the syntax:



- (21) Most are lazy

Westerståhl (1985) provides a formal framework for context sets that come along with all determiners. He introduces an operation on determiners called *restriction*: if  $D$  is a unary determiner and  $X$  a fixed set, define a new unary determiner,  $D^X$ , by:

- (22)  $D^X_E AB$  iff  $D_E(X \cap A)B$

A second issue that has been brought up in the literature with respect to argument selection of determiners concerns the fact that focus on an adverbial phrase in the second argument of a determiner (given by the VP) results in interpreting the non-focussed part of the VP as a kind of extra restriction to the first argument set. The following example of Krifka (1990) is discussed by Partee (1991, 1994):

- (23) Most ships pass through the lock at night  
 a MOST (ships)(pass through the lock at night)  
 b MOST (ships that pass through the lock)(pass through the lock at night)

In (23a) *most* quantifies over ships, but in (23b) it quantifies over ships that pass through the lock, which is by far the preferred reading if the adverbial phrase *at night* is in focus. In fact, we get a truth-conditional effect here:

- (24) a Most linguists drink  
 b Most linguists drink [at night]<sub>F</sub>

In a situation where six linguists do not drink at all, five linguists drink, and three of them at night, (24a) will be false, but (24b) true. In De Hoop and Solà (in prep.) it is hypothesized that focus can determine Westerståhl's context set variable  $X$ :  $X$  is equated with the generalized union over the set of alternatives (the C-set) of the argument that contains an element in focus (see also Geilfuß 1993). Once again, focus does not automatically serve as a guide in determining the relevant C-set. The C-set has to be pragmatically determined, but focus will serve as a clue in the unmarked contexts. That leads to the following truth conditions for (24b):

- (25) a  $most_E(A \cap X)B$  iff  $|(A \cap X) \cap B| > |(A \cap X) - B|$   
 b  $A = \{x \in E \mid \text{linguist}(x)\}$ ;  $B = \{x \in E \mid \text{drink at night}(x)\}$   
     $C = \text{set of alternatives for } B, \text{ so e.g., \{drink in the morning', drink in the afternoon', drink at night'\}}$   
 c  $X = \bigcup C = \{x \in E \mid \text{drink in the morning or afternoon or at night}(x)\}$

So, in the situation described above, sentence (24b) will come out as true, since  $|(A \cap \bigcup C) \cap B| > |(A \cap \bigcup C) - B| = 3 > 2$  is true.

It has also been pointed out in the literature (cf. Partee 1994) that a focussed item within the first argument of the determiner (the N'), does not lead to an interpretation as if the focussed element becomes part of the second argument. That is, (26) does not mean that most of the linguists that drink are lazy:

(26) Most [lazy]<sub>F</sub> linguists drink

This falls out nicely from our analysis, since in this example the context variable  $X$  gets equated with the generalized union over the set of alternatives to  $A$  and the intersection of  $A$  (the set of lazy linguists) and  $\bigcup C$  (e.g., the set of linguists that are lazy or busy) will always be equal to  $A$ , as  $A$  is always a member of its own  $C$ -set. That explains why focus in the first argument of an ordinary determiner can never make a truth-conditional difference.

However, recall that focus in the first argument part of *only* does have a truth-conditional effect (cf. (20) above). I will use the remaining space for an explanation of this exceptional behaviour of *only*.

##### 5. Only, focus, and context sets

First, we have seen that w.r.t. *only* as a VP-modifier, the context (with help of focus) has to provide the second argument set for the quantifier, in contrast with a quantificational adverb such as *always*, where context (with help of focus) can provide the first argument set. Second, ordinary determiners live on their first argument set,  $A$ , but *only* as a determiner lives on its second argument set,  $B$ . If we define the domain of quantification as the set the quantifier lives on, then we can maintain that in all cases, focus can contribute to the determination of the domain of quantification. Therefore, in the case of ordinary determiners context (with help of focus) can contribute to the determination of  $A$ , but in case of *only*, context (focus) can contribute to the determination of  $B$ . I define *restriction* on the determiner *only* as follows:

(27)  $only^X_E AB$  iff  $only_E A(B \cap X)$

Just as in case of ordinary determiners,  $X$  can be equated with the generalized union over the set of alternatives to the argument that contains focus. So, for the example in (20a), repeated below, we get the following:

- (20) a Only  $[\text{lazy}]_F$  linguists drink  
 (28) a  $\text{only}_E A(B \cap X)$  iff  $A \supseteq (B \cap X)$   
 b  $A = \{x \in E \mid \text{lazy linguist}(x)\}$ ,  $B = \{x \in E \mid \text{drink}(x)\}$   
 $C = \text{set of alternatives for } A, \text{ so e.g., } \{\text{lazy linguist}', \text{busy linguist}'\}$   
 c  $X = \bigcup C = \{x \in E \mid \text{lazy or busy linguist}(x)\}$

Therefore, in order for sentence (20a) to be true, the set of lazy linguists has to be a superset of the set of drinking lazy or busy linguists, or to put it differently, the set of drinking lazy or busy linguists minus the set of lazy linguists should be empty. This gives us the correct result for the meaning of (20a). The readings of (20b) and (20c) (in (20c) the union over the set of alternatives might give you for instance the set of academic people or even the set of individuals,  $E$ ) follow straightforwardly as well.

Note that my analysis predicts that focus in the second argument of *only* cannot have a truth-conditional effect, unlike in the case of the other determiners. So, (29) will be true if the set of linguists ( $A$ ) is a superset of the set of individuals that drink at night ( $B \cap \bigcup C = B$ ). Although it is very easy (or maybe even obligatory) to put an additional focus on the noun here which again can have a truth-conditional effect (thanks to Chris Piñón for drawing my attention to this fact), this does not contradict the prediction that focus in the second argument of *only* does not affect truth conditions. The prediction is borne out.

- (29) Only linguists drink  $[\text{at night}]_F$

## 6. Conclusion

*Only* is not so different from other quantifiers after all. In case the syntax does not provide both argument sets to be semantically related by a quantifier, a contextually determined set of alternatives can function as the first argument set of quantifying adverbs and as the second argument set of the VP-modifier *only*. In case of determiners, where the syntax in principle provides both argument sets, a contextually determined set of alternatives can be used to further restrict the first argument set of ordinary determiners and to restrict the second argument set of the determiner *only*. We can maintain that focus in general can contribute to the determination of the domain of quantification of quantifiers, if we use the property of Conservativity to define the latter notion. In this article it has been observed that focus can only have truth-conditional effects if it bears on the constituent that does not provide the domain of quantification. The reasons for this follow straightforwardly from an analysis in which a context set that intersects with the set the quantifier lives on can be fixed with help of focus. In any case, although focus can help to determine the contextually needed set of alterna-

tives, there is no necessary link between focus and this set of alternatives. Context can always overrule focus.

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