ONLY IF(1)

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1. *Introduction*

There are some interesting problems in the analysis of garden variety *only* – as in (1), an example made famous by Horn (1969:38) – as well as in the analysis of the use of *only* in *only if* – as in (2).

(1) Only Muriel voted for Hubert.
(2) All men are mortal only if Socrates is mortal.

The first half of this paper is devoted to a presentation of such problems. In the second half I will work towards an integrated solution of both types of problems, where 'integrated' means two things. First, the solution of the *only Muriel* problems should not be independent of that of the *only if* problems. The justification, implicit in Ducrot (1971) and Horn (1969:106, 1972:82) – cp. also Finnis (1977:F1-G6) – and explicit in Geis (1973:248), McCawley (1974, 1981:49-54) and König (1981a), is that *only if* is not an idiom or, again, that if a speaker knows the meaning of *only* as well as that of *if*, then he also knows the meaning of *only if*. Second, 'integration' also means that the subtheory of *only* – and that of all scalar particles – should be integrated in a general theory of meaning and that we should try to use machinery that has an independent motivation.

2. *Only if* problems

Logicians (e.g. Quine 1962:41) as well as linguists that have wanted to know more about logic (e.g. Seuren 1975:328-329; König 1981a)

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standardly treat *only if* as a converse of *if*, such that *if p then q* would 'mean' the same as *p only if q*. Thus (2) and (3) would have the same or, at least, the same 'logical' meaning – whatever 'logical' means.

(3) If all men are mortal, then Socrates is mortal.

To use a terminology that logicians use, yet do not really pay sufficient attention to – more about this later – both (2) and (3) seem to express that the fact that Socrates is mortal is a necessary condition for it to be the case that all men are mortal.

These are at least two kinds of problems with such a view. First, while it is at least *prima facie* plausible, on the basis of sentences such as (2) and (3), to think that *if* and *only if* are interchangeable, one can come up with sentences in which *if* and *only if* do not seem to be interchangeable at all. McCawley (1981:49-50) gives many examples.

(4) If you're boiled in oil, you'll die.
(5) You'll be boiled in oil only if you die.

Perhaps such sentence pairs are not fully damaging to the interchangeability thesis. The asymmetry in (4) and (5) might be explained away pragmatically. Thus (4) and (5) wouldn't 'really' mean the same, because they would strongly suggest, implicate, or invite an inference of a different temporal and/or causal relation (McCawley 1981:50) and/or they would have a different topic-comment structure (Seuren 1979:33). Whatever the correct account of this phenomenon may be – and I will leave the question unsolved, there is a second problem with the interchangeability thesis, one that does not seem to admit of a pragmatic way out – for an attempt see McCawley (1974) and König (1981a).

It seems to me that any reasonable account of garden variety *only* would have to say that the sentence with *only* entails (semantically implies) the sentence without *only*. Thus (1) entails (6).

(6) Muriel voted for Hubert.

I truly cannot imagine any situation in which (1) is true, but (6) is not. Now, given that *only if* is a combination of *only* and *if*, one would also want to say that (2) entails (7).

(7) All men are mortal if Socrates is mortal.

This entailment is incompatible with the interchangeability thesis. (3), which would have the same logical meaning as (2), clearly doesn't entail (7). From *if p then q* one cannot infer *if q then p*. The minimal conclusion is this: it is difficult to see how one can combine the interchangeability thesis with the view that *only if* is composed out of the ordinary *if* and the ordinary *only*.

3. *Only Muriel* problems

From Horn (1969) well into this decade (*e.g.* Dahl 1970:93, 1974:19-21; Ducrot 1971, 1972:133, 152-165; Karttunen 1971:67; Altmann 1976; Dominicy 1980:175, 1983:330; König 1981a; Cushing 1982:23-28) garden variety *only* was a canonical illustration of the notion of **presupposition**. Not only (1) would entail (6), so would the negation of (1).

(8) Not only Muriel voted for Hubert.

This entailment, constant under negation, was the presupposition. The classical presupposition account proved partially correct and partially mistaken. First, it is wrong to claim that a negation must preserve the alleged presupposition.

(9) – Only Muriel voted for Hubert.
– Wait a minute. It is not the case that only Muriel voted for Hubert. There simply wasn't any election.

It is even wrong to claim that a *not only* type of negation preserves the presupposition. Here is an example adapted from Reis (1977:57):

(10) – There is somebody at the door. I guess it is only the postman.
– No, it's not only the postman, it is the police inspector.

Second, it is correct that the so-called presupposition is preserved in the vast majority of cases, and that a cancellation is something special – it creates an echo-effect. Both in (9) and in (10), the second speaker echoes an affirmative *only* sentence of the first speaker.

What seems to have replaced presupposition in more recent analyses of *only* is **conventional implicature**. Interestingly – and dange-

rously – this didn't start in a study of *only*, but in one of *even* (Karttunen & Peters 1979:11, 32). Of course, at least since Horn (1969), the fate of *only* has been associated with that of *even*, and in the meantime König (1979, 1981b, 1981c) has argued that conventional implicature plays a role in the analysis of many *only* and *even* type words. Unfortunately, in the case of *only*, the conventional implicature idea seems to lead to the wrong conclusions (cp. Epstein 1977:39-40). A conventional implicature is essentially a non-truth-conditional element of meaning. Yet I find it undeniable that the alleged conventional implicature of an *only* assertion, *i.e.* the assertion without *only*, **has to be true** for the *only* assertion to be true. Muriel **must** vote for Hubert in order to be the only one to vote for Hubert. This could mean that the *only*-less assertion is not a conventional implicature, and that only is not the same type of word as *even* (cp. Bartsch 1979:374; König 1981a, 1981b:115, 129). Yet if there are reasons to think that *only* **is** an *even* type word, then it could also call the very concept of conventional implicature into question.

So much for the first set of problems about ordinary *only*. I now come to a second set. The class of words that *only* is arguably a member of is that of the 'scalar' particles, yet the strange thing is that it is unclear wheter *only* even has a so-called 'scalar' reading. The distinction between scalar and non-scalar readings is due to or was at least brought to the foreground by Horn (1969). The terminology is based on Altmann (1976); the non-scalar reading is also called 'quantifying'.(2)

Horn (1969) suggested that term scope *only* has a non-scalar *no other than* reading, which excludes all other terms. So (1) would assert that nobody other than Muriel voted for Hubert. Predicate scope *only*, however, would induce a scale as well as an ordering on the scale, and it would then exclude all the higher values.

(11) Fred is only a plumber.

Thus (11) could induce a scale ordering professions on their social prestige and it would then exclude the prestige of the professions that are higher on the scale (*e.g.* lawyer, banker). This is the scalar *no greater than* reading. Here now is a catalogue of problems. First, in

(2) ALTMANN (1976) distinguishes yet a third reading, the so-called 'polar' reading.

Horn's dissertation (1971) it is left unclear whether the distinction between term and predicate scope really correlates with the distinction between non-scalar and scalar readings. In any case, Horn (1972:50) would allow the *only* of (11) both a *no other than* and a *no greater than* reading (cp. also Altmann 1976; Finnis 1977:D6). Second, it has been argued (see Ducrot 1972:261-262; Van der Auwera 1975:41; Altmann 1976; Finnis 1977:D4-D6; Dominicy 1983:332) that term scope *only* allows scalar readings. Thus a scalar reading of (1) could induce a scale ordering people on the amount of respect that the speaker has for them, and it would exclude the amount of respect that he has for people higher on that scale than Muriel. Third, what is the status of the distinction between scalar and non-scalar readings? Are both of them literal meanings and is *only* genuinely ambiguous (cp. Horn 1969:102)? Is one of them a literal meaning and is the other one due to the linguistic environment (cp. König 1981b:118-119) or is it something like a conversational implicature? Or is there a literal meaning that is vague between scalar and non-scalar readings?

4. An *only Muriel* proposal

4.1. I have now raised more questions than I am able to solve, but at least I have some definite proposals to start solving them. Those proposals are based on three general ideas: (i) the essential 'about'-ness of language, (ii) the condition-theoretic approach; and (iii) the essential scalarity of language. The presentation of these ideas must be brief and informal. There is no claim to precision, only to intuitive content and the suggestion that the ideas **can** be made more precise (see Van der Auwera 1985).

4.2. When we speak, we always speak about something. When something is true, it is always true of something. In a sense, this 'something' is nothing short of the entire universe. But what is true is also true of some more abstract 'slices' of the universe, of so-called 'states of affairs'. So when I say (6), I seem to be speaking about a state of affairs in which Muriel voted for Hubert. There is no pretention that the assertion is an exhaustive description of the state of affairs I am talking about. Perhaps Muriel was not the only one to

have voted for Hubert or perhaps Muriel also campaigned for Hubert. Yet, on the other hand, perhaps Muriel was indeed the only Hubert-voter and perhaps she didn't campaign. Both when Muriel and, say, Dolores voted for Hubert, and when only Muriel voted for Hubert, (6) is true. Thus what is needed to make (6) true is a state of affairs in which **at least** Muriel voted for Hubert. I suggest, expanding on Horn (1972) that *Muriel* literally means *at least Muriel*. Actually, most words and phrases of ordinary language have an implicit *at least* operator hidden in their literal meaning. So (6) could be expanded into something like (12):

(12) (at least (Muriel)) (at least (voted))
(at least (for Hubert))

Ducrot (1978) calls this the **'contextual minimalism'** hypothesis. It concerns a minimalism because of the *at least* operator; the minimalism is contextual because it is implicit.([3])

Let me bring in **condition theory** now. Condition theory is to provide us with an account of such notions as those of sufficient condition, necessary condition, and necessary condition for a sufficient condition (Mackie's famous 'INUS condition', see Mackie 1975 and Van der Auwera 1981). Such a theory hardly exists, despite the appeals that von Wright has been launching ever since 1941 (von Wright 1941). Yet it is important. In Van der Auwera (1985) I have used condition theory as the basis for a theory of **truth** conditions (*i.e.* a certain type of conditions) as well as for a theory of **conditionals** (*i.e.* sentences that express conditions). I have also used conditionality notions in the analysis of the phrase *at least*. When at least Muriel voted for Hubert, it is sufficient that Muriel and Dolores voted for Hubert. It is equally sufficient that only Muriel voted for Hubert, and the 'only'-ness of Muriel is not only sufficient for truth, but necessary. Thus the notion of 'sufficient' that I use means 'sufficient if not necessary and sufficient' or '*at least* sufficient'. Using 's' for 'sufficient if not necessary and sufficient', I can rewrite (12) as (13).

([3]) DUCROT (1972) was a contextual minimalist, but the development of his theory of 'argumentative scales' made him change his mind (see Ducrot 1973:274-283, 1978; Anscombre & Ducrot 1983). It is beyond the scope of this paper to evaluate the 'argumentative scale' approach (cp. Fauconnier 1976; Dominicy 1985).

(13) (s(Muriel)) (s(voted)) (s(for Hubert))

The *only* hypothesis ('**H1**') that I propose and that is implicit in the preceding is that *only* essentially turns the 'sufficient if not necessary and sufficient' of its scope constituent or, as is better to call it nowadays (König 1981b, 1981c), its focus constituent, into a 'necessary and sufficient'. Thus *only Muriel* requires the necessary and sufficient condition for *Muriel*, which is simply *Muriel*, and it excludes things like *Muriel and Dolores*, which is not necessary and sufficient, but only sufficient.

The above idea is fairly simple – though it is easy to underestimate the difficulties of making it more precise – and it is not new. The essence of H1 can be found in Ducrot (1971).

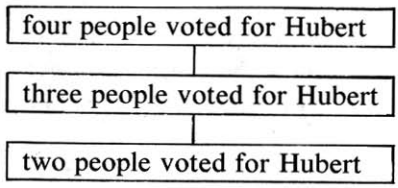
4.3 The phrase *at least* is a signal of **scalarity**. That is to say that an *at least* operator puts its focus constituent on a scale and that the higher and the lower points are **not** evaluated in the same way. (If they are evaluated in the same way, there is no reason to speak about a scale.) In the case of *at least*, the lower values get a positive evaluation, the higher values are evaluated as 'possible'. Here is a fairly straightforward example:

(14) At least three people voted for Hubert.

The most obvious scale to be associated with (14) is that of the growing number of Hubert-voters. (15) represents a fragment of such a scale:(4)

(4) There are two features of the scale worth commenting on. First, the scale is 'downward-entailing'. This is in conformity with Altmann (1976), Fauconnier (1980), and Dominicy (1983), but one could just as well use an 'upward-entailing' representation (cp. Fauconnier 1975a, 1975b, 1977, 1978). Second, the scale lists full sentences rather than focus values. One could think that a focus value scale would be better and simpler, but as Fauconnier (1975a, 1975b) has shown, this is not the case.

(15) ...



...

Two occupies a lower rung on the scale, and to say that it gets a positive evaluation just means that when (14) is true, it is also true that two people voted for Hubert. *Four* is a higher value, and its possibility interpretation says that if (14) is true, it is also true that it is possible that four people voted for Hubert.

Now, if it is correct that the semantics of *only* is to be understood as an elimination of an *at least* meaning, then this suggests that the meaning of *only* is a scalar one, and it further suggests that it is **always scalar**. This is an interesting hypothesis for it seems to be at odds with the presently accepted opinion that *only* has both a scalar and a non-scalar reading, and even more so, perhaps, with the view advanced by König (1981b:118-119) that the non-scalar reading is the basic one.

The scalar hypothesis ('**H2**') that I propose is this: *only* excludes higher values and it includes lower ones. An easy illustration:

(16) Only three people voted for Hubert.

If (16) is true – in the preferred *no greater than* interpretation – it is false that four people voted for Hubert, and it is true that two people voted for Hubert. H2 takes account of this. Of course, it is no great feat to apply H2 to the preferred reading of (16). The *no greater than* reading has 'always' been called 'scalar'. In the next section, however, I will argue that even a *no other than* reading can be called 'scalar'.

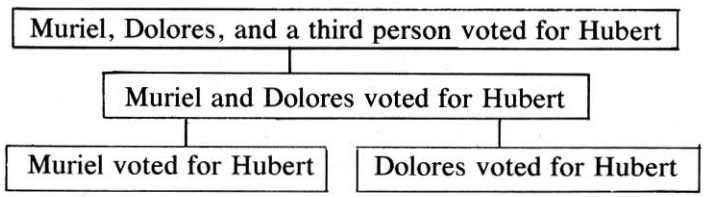
3.4. The preferred reading of (1) has it that none other than Muriel voted for Hubert. This *only* would be non-scalar, because it would exclude **all** possible alternatives to the focus value *Muriel*, and not just those that are higher or lower on some scale.

The best way to see what is wrong with this kind of reasoning is to look at a more complex example.

(17) Only Muriel and Dolores voted for Hubert.

The *only* of (17), interpreted as *no other than* does **not exclude all** alternatives to the focus value *Muriel and Dolores*. There are exactly two values that it does not exclude, but include, viz. *Muriel* and *Dolores*. The only thing that I need to do to invoke a scalarity explanation is to come up with a scale that orders *Muriel* and *Dolores* on one side of *Muriel and Dolores*, and all others values on the other side. Such as scale is not hard to construct.

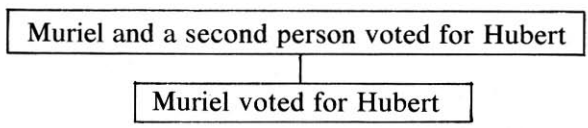
(18) . . .



The above scale is bifurcate. This is unusual perhaps, though there can be no *a priori* objection to such scales, and they do have an independent motivation (Van der Auwera 1985).

Returning to (1), we can now see why its *only* induces a uniform treatment to **all other** values, and why it thus suggests a non-scalar analysis. On the scale that is appropriate for (1), *Muriel* happens to be the lowest value.

(19) . . .



It is a limit value; it only has higher values. It is true, therefore, that it could be given a non-scalar analysis. But there is no need for it, and, given a scalar analysis for all the non-limit values, it is entirely unwanted.

Two remarks to end with. First, in an unexpected way my claim that *only* is always scalar is not too divergent from König's claim

(1981b:118-119) that *only* is always non-scalar. Whatever scalarity *only* has, König argues, is not due to *only* itself, but to its linguistic context. I could agree, but I would add that the linguistic context of *only* is **always** scalar (contextual minimalism). Second, by claiming that both *no other than* and *no greater than* readings are scalar, I am not denying that there is a distinction between them, not have I offered a clarification of it. This problem, as well as many other problems mentioned in section 3, remains unsolved.(5) However limited the present *only Muriel* proposal may be, it does allow a definite stand on the *only if* problem. This is what I'll argue in the next section.

5. An *only if* proposal

I have argued in Van der Auwera (1985) that *if p then q* means that *p* is a sufficient condition for *q*, where 'sufficient' means 'at least sufficient' or 'sufficient if not necessary and sufficient'. I will call this the 'Sufficient Conditionality Thesis' ('**SCT**'). SCT is not new, but the trouble is that many logicians would say that SCT belongs to the folklore of logic rather than to logic itself. SCT is found when the logician admits to sloppiness, as when he gives a layman a rough idea of an implication, before embarking on logic proper and supplying precise definitions. I have argued, however, that SCT **can** and **should**

(5) A *no greater than* reading that H2 doesn't account for is that of (11). Say that we associate (11) with the following prestige scale:

...

Fred is a lawyer

Fred is a plumber

Fred is a cowboy

...

It is obviously incorrect that when (11) is true, it is also true that Fred is a cowboy. We would rather say that when Fred has the prestige of plumber status, he also has the prestige of cowboy status.

be accomodated within logic proper, notwithstanding *prima facie* counterevidence.

The combination of the independently defendable H1 and SCT gives us a theory of *only if*. H1 says that *only* turns a sufficient conditionality into a necessary and sufficient conditionality. The focus constituent of the *only* of *only if* is *if* – or an *if* sentence. SCT says that *if* expresses a sufficient conditionality. Hence *only if* expresses a necessary and sufficient conditionality. Phrased more fully, *p only if q* means that *q* is a necessary and sufficient condition for *p*.

The above *only if* proposal is not entirely self-evident. At least, one could make various plausible objections to it, much the same as the ones one can raise against SCT, in fact. I will treat one such objection. Consider (20):

(20) The match will light only if you strike it.

Obviously, so the objection goes, it is **not** necessary and sufficient for a match to light that one strikes it. Obviously, there are many other necessary conditions, such as the presence of oxygen, the dryness of the match, and a good striking technique.

Let me start to counter this objection by pointing out that the same objection can be raised against SCT. If the presence of oxygen is a necessary condition, then the mere striking of the match cannot be sufficient to light it. The answer to this objection capitalizes on the essential 'about'-ness of natural language. Just like any other sentence, a conditional sentence is about the universe and about some state of affairs. Quite essentially, every *if p then q* sentence involves some third element *r* which *if p then q*, if true, is true of. It is this *r* that is the *locus* of all the extra conditions (presence of oxygen, etc.). *r* is left unexpressed, because it is taken for granted or, technically, pragmatically presupposed. The pragmatically presupposed *r* conditions are *ceteris paribus* conditions.

(21) The match will light if you strike it.

So what (21) means, for example, is that given a pragmatically presupposed state of affairs *r* (in which there is enough oxygen, etc.), striking the match is sufficient to light it. Similarly, (20) says that given a certain pragmatically presupposed state of affairs *r* striking the

match is both necessary and sufficient for lighting it.

A final remark. It is a consequence of the *only if* proposal that *p only if q* and *p if and only if q* have identical truth-conditions. This is by no means an unwelcome consequence. (1) and (22) have identical truth-conditions, too.

(22) Muriel and only Muriel voted for Hubert.

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