

24.954 Pragmatics in Linguistic Theory  
Lecture Notes\*

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\*These notes were developed by Irene Heim and myself over the last few years. Because this version of the notes has not been seen by my co-author, I alone am responsible for any defects.

# Language in Context

Pragmatics is concerned with many aspects of how people use language, too many for us to look at in this course. We will concentrate on some of the ways language use in context interacts with the structure of language and thus on some of the ways that language use in context impacts on the concerns of theoretical linguistics.

## The Pragmatic Wastebasket

Vagaries of language use and of language processing are often used to explain away recalcitrant data, in essence they serve as the “friction” of linguistics, or to put it less politely as a “wastebasket” (*Bar-Hillel* 1971). But such maneuvers are of course dubious. One might as well blame data one can’t explain on the influence of the stars. Using a pragmatic theory as an explanatory tool only works as long as one actually has such a theory. We’ll try to develop the basics of one.

Here are some of the phenomena we’ll be dealing with.

## Contextual Inferences, Implicatures

Together with assumptions in the context, people make inferences that a semanticist will want to be distinguished from the “hard-wired” content of the sentences that are uttered. This becomes especially hard when the assumptions that drive the inferences are natural and common ones.

## Context-Dependency

There are many expressions that have context-dependent meanings. An obvious example are free pronouns whose reference can only be determined in a “live” context.

## Context Appropriateness, Presupposition

Many expressions require the context to be a certain way. They are only felicitous/appropriate/usable in certain contexts. An obvious example comes from context-dependent expressions which require the context to supply (some part of) their meaning.

Another example are expressions that carry presuppositions, which again can be thought of as requirements imposed on the context. There arises an interesting hypothesis: that the main or only source of presuppositions is anaphoricity or context-dependency (see *van der Sandt & Geurts* 1991; *van der Sandt* 1992; *Geurts* 1995, 1999; *Peter* 2001).

## Context Change

Once language is used, the context (which in a certain sense is just everything that is the case) is thereby changed. Since language depends or interacts with context in many ways (see above), one bit of language changes the environment for the next. This creates all kinds of intricate feedback situations, some of which are explored in Dynamic Semantics.

## Conclusion

All of these interactions are intertwined with each other, so unravelling what's going on is not going to be easy. But fun.

Part I

# Implicature

# Chapter 1

## Conversational Implicature

### 1.1 Some Types of Inferences

“Semantically valid” inferences based solely on the assumed truth of the sentence together with facts about semantic values and about principles of logic. These are the only inferences that our semantic theory needs to directly account for all by itself. The methodological problem is to distinguish these semantic inferences from the other kinds of inferences.

- (1) John had dinner with some MIT students last night.  
⇒ John had dinner with some students last night.

Inferences from the assumed truth of the sentence together with other facts and assumptions. Particular assumptions:

- (2) John had dinner with some MIT students last night.  
⇒ John has come home early from his field trip into the rainforest.<sup>1</sup>

General assumptions:

- (3) John had dinner with some MIT students last night.  
⇒ John didn't have dinner with all the MIT students last night.

Inferences from the fact that the speaker asserted the sentence s/he asserted and not some other sentence.

- (4) John had dinner with some MIT students last night.  
⇒ The speaker thinks this is interesting/relevant.  
⇒ The speaker thinks I don't know this.  
etc.

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<sup>1</sup>We leave it to you to guess which assumptions this hearer is using in this inference.

## 1.2 Distinctions

There is quite a bit of taxonomic exuberance in the literature.

Within the inferences that go beyond the truth-conditional entailments of a sentence, scholars have been careful to carve out a set that is characterized by the speaker bearing responsibility for the hearer drawing the inference. These are roughly the ones where the speaker knows that the hearer can draw on certain additional assumptions and where the speaker knows that the hearer knows that the speaker knows about that, and so on. In short, the assumptions driving these inferences are mutually obvious, are common knowledge. Only these inferences, it is felt, deserve to be taken to be part of the full meaning of the sentence uttered in the context it was uttered in (utterance meaning, speaker meaning, what is meant by the sentence).<sup>2</sup> Of course, the hearers may make further inferences, based on their own private information state, but those the speaker bears no responsibility for and they are not felt to be part of the meaning of the utterance. The inferences that are blessed by mutuality and are not truth-conditional entailments are called *implicatures*.

### WHAT IS MEANT – WHAT IS SAID = WHAT IS IMPLICATED

“An implicature is a proposition that is implied by the utterance of a sentence in a context even though that proposition is not a part of nor an entailment of what was actually said.” (*Gazdar* 1979, p. 38).

Within implicatures, there are inferences that seem somehow to be part of the specifically encoded linguistic meaning of the sentence but are still somewhat separate from truth-conditions. Grice discusses two pertinent examples in his lecture (“He hasn’t been to prison yet”, “He is an Englishman, therefore brave”). These elements of meaning are called *conventional implicatures*, and we have little to say about them (although they may be related to presuppositions, which we will investigate later in the course.)

What we will be concerned with are *conversational implicatures*.

### Cancelability

Note that since for conversational implicatures hearers draw on collateral information of one sort or another, a speaker can forestall such inferences by explicitly denying that certain assumptions are true.

- (5) John had dinner with some MIT students last night. But I don’t want you to think that he’s back from the rain forest. They actually went to

<sup>2</sup>There are many subtleties here, which you could explore by starting with the book by *Avramides* (1989).

visit him at his camp.

### 1.3 Some of Grice's Examples

#### The Gas Station

A is standing by an obviously immobilized car and is approached by B; the following exchange takes place:

- (6) A: I am out of petrol.  
B: There is a garage around the corner.

#### Smith's Love Life

- (7) A: Smith doesn't seem to have a girlfriend these days.  
B: He has been paying a lot of visits to New York lately.

B implicates that Smith has, or may have, a girlfriend in New York.

#### The Letter of Recommendation

A is writing a testimonial about a pupil who is a candidate for a philosophy job, and his letter reads as follows: "Dear Sir, Mr. X's command of English is excellent, and his attendance at tutorials has been regular. Yours, etc."

#### The Weather

At a genteel tea party, A says Mrs. X is an old bag. There is a moment of appalled silence and then B says

- (8) The weather has been quite delightful this summer, hasn't it?

#### The Cote d'Azur

A is planning with B an itinerary for a holiday in France. Both know that A wants to see his friend C, if to do so would not involve too great a prolongation of his journey:

- (9) A: Where does C live?  
B: Somewhere in the South of France.

#### Evening with a Woman

Anyone who uses a sentence of the form X is meeting a woman this evening would normally implicate that the person to be met was someone other than

X's wife, mother, sister, or perhaps even close platonic friend. Similarly, if I were to say X went into a house yesterday and found a tortoise inside the front door, my hearer would normally be surprised if some time later I revealed that the house was X's own. I could produce similar linguistic phenomena involving the expressions a garden, a car, a college, and so on. Sometimes, however, there would normally be no such implicature ("I have been sitting in a car all morning"), and sometimes a reverse implicature ("I broke a finger yesterday").<sup>[3]</sup>

...

[T]he implicature is present because the speaker has failed to be specific in a way in which he might have been expected to be specific, with the consequence that it is likely to be assumed that he is not in a position to be specific.

## 1.4 Grice's System

### The Cooperative Principle

Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged.

### The Maxims

#### Quantity

1. Make your contribution as informative as is required.
2. Do not make your contribution more informative than is required.

#### Quality

1. Do not say what you believe to be false.
2. Do not say that for which you lack adequate evidence.

#### Relation

Be relevant.

#### Manner

1. Avoid obscurity of expression.
2. Avoid ambiguity.
3. Be brief.
4. Be orderly.

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<sup>3</sup>Said by anyone other than a mob enforcer, one would think. [This is not Grice's footnote!]



### Working out an implicature

He has said that  $p$ , there is no reason to suppose that he is not observing the maxims, or at least the Cooperative Principle; he could not be doing this unless he thought that  $q$ ; he knows (and knows that I know that he knows) that I can see that the supposition that he thinks that  $q$  is required; he has done nothing to stop me thinking that  $q$ ; he intends me to think, or is at least willing to allow me to think, that  $q$ ; and so he has implicated that  $q$ .

## 1.5 Some web destinations about Grice

1. Gauker's on Grice in the online Dictionary of the Philosophy of Mind:  
<http://www.artsci.wustl.edu/~philos/MindDict/grice.html>
2. Bach on Grice in the MIT Encyclopedia of the Cognitive Sciences:  
<http://online.sfsu.edu/~kbach/grice.htm>

## Chapter 2

# Scalar Implicature

### 2.1 The Phenomenon

Some standard examples of so-called scalar implicature (*Atlas & Levinson 1981*, p.35): In each of the following pairs,  $\alpha$  appears to conversationally implicate  $\beta$ .

- (1)  $\alpha$ : Some of the boys are at the party.  
 $\beta$ : Not all of the boys are at the party.
- (2)  $\alpha$ : Morton has three children.  
 $\beta$ : Morton has no more than three children.
- (3)  $\alpha$ : Not all of the boys are at the party.  
 $\beta$ : Some of the boys are at the party.
- (4)  $\alpha$ : Paul may be in his office.  
 $\beta$ : Paul may not be in his office.
- (5)  $\alpha$ : Rick is a philosopher or a poet.  
 $\beta$ : Rick is not both a philosopher and a poet.
- (6)  $\alpha$ : Rick is not both a philosopher and a poet.  
 $\beta$ : Rick is either a philosopher or a poet.

#### Properties of these inferences

- Hearers of an assertion of  $\alpha$  typically infer  $\beta$ .
  - $\alpha$  does not entail  $\beta$ , as can be seen from the fact that ' $\alpha$  &  $\neg \beta$ ' can be asserted without contradiction ('cancellability').
- (7) Some of the boys are at the party. In fact, all of them are.
  - (8) Not all of the boys are at the party. In fact, none of them are.

- (9) Morton has three children. In fact, he has four.
- (10) Paul may be in his office. In fact, he must be there.
- (11) Rick is a philosopher or a poet. In fact, he is both.
- (12) Rick is not both a philosopher and a poet. In fact, he is neither.

## 2.2 The challenge for Gricean pragmatics

*Problem:* If the  $\beta$ -sentences are not entailed by the  $\alpha$ -sentences, then why do listeners spontaneously infer them?

*Suggested answer:* The listener assumes that the speaker has asserted  $\alpha$  correctly (i.e., has been cooperative and tried to obey the Gricean maxims). **From this assumption it follows that the speaker believes that  $\beta$  is true.** If the speaker is assumed to be reliable (well-informed), it follows further that  $\beta$  is in fact true.

Let us try to flesh out this suggested answer and examine whether it is plausible. In particular, let us look at the claim we have bold-faced. Is it really true that ‘The speaker believes that  $\beta$  is true’ follows from the assumption that the speaker has made correct use of  $\alpha$ ? What conditions for correct usage (“maxims”) do we have to invoke in order to show that it follows? Do we need additional premises apart from the assumption that these conditions were met?

## 2.3 Quantity implicatures and their derivation

A “quantity implicature” arises when the first maxim of quantity (‘Make your contribution as informative as is required’) comes into apparent conflict with the maxim of quality (‘Don’t say what you believe to be false or lack adequate evidence for’).

### Grice’s Cote d’Azur example again

A is planning with B an itinerary for a holiday in France. Both know that A wants to see his friend C, if to do so would not involve too great a prolongation of his journey:

- (13) A: Where does C live?  
B: Somewhere in the South of France.

(Gloss: There is no reason to suppose that B is opting out; his answer is, as he well knows, less informative than is required to meet A’s needs. This infringement of the first maxim of Quantity can be explained only by the supposition that B is aware that to be more informative would be to say something that infringed the second maxim of Quality. ‘Don’t say what you lack adequate evidence for’, so B implicates that he does not know in which town C lives.)

What is the general pattern of reasoning that we have here seen exemplified?

***Gamut* (1991, pp. 205f.)**

We will reformulate Grice's maxims as conditions under which statements can be made correctly. [...]

- (14) A speaker S makes correct use of a sentence A in order to make a statement before a listener L just in case:
- (i) S believes that A is true;
  - (ii) S believes that L does not believe that A is true;
  - (iii) S believes that A is relevant to the subject of the conversation;
  - (iv) For all sentences B of which A is a logical consequence (and which are not equivalent to A), (i) - (iii) do not all hold with respect to B. [...]

A sentence B is a conversational implicature of a sentence A iff B is a logical consequence of the conditions under which A can be correctly used.

**Questions and Comments**

- **Question** How does Gamut's proposal apply to Grice's example?
- Condition (ii) in (14) can be safely omitted from our calculations.  
**Question:** Why?
- Once we conclude via (iv) in (14) that it does not hold that the speaker believes that B is true, we should not be tempted to conclude that therefore the speaker believes that B is not true or false. In principle, *not believe that p* is not the same as *believe that not p*. This is obscured by the fact that in English (and other languages), we have the phenomenon of "Neg-raising": sentences like *I don't believe it is raining* have a natural reading under which they are equivalent to *I believe that it is not raining*. Exactly what the explanation for neg-raising is will not concern us here. As a matter of hygiene, we might want to use *be convinced that* instead of *believe* in discussing implicature calculations. Alternatively, we could employ some notation such as  $K_{Sp}$  to symbolize "The speaker is convinced that p" and then remember that  $\neg K_{Sp} \neq K_S \neg p$ .

**Weak Implicatures Predicted**

In 2.1, we introduced a number of pairs  $\alpha, \beta$ , where informally it seemed that  $\beta$  was an implicature of  $\alpha$ . Further, each  $\beta$  can plausibly be thought of as the negation of a statement that asymmetrically entails  $\alpha$ . Can we show based on

Gamut's machinery that for each such pair,  $\beta$  is a conversational implicature of  $\alpha$ ? No.

Weakness # 1 As we already noted, the calculation will at best yield that the speaker believes that  $\beta$  is true. Anything beyond that depends on whether the speaker is deemed to be well-informed.

Weakness # 2 Further, the calculation will only yield that it does not hold that the speaker believes that  $\neg\beta$  is true, which as we noted is not the same as the speaker believing that  $\neg\beta$  is not true (= the speaker believes that  $\beta$  is true). This will only follow from an additional assumption: that the speaker is not agnostic about  $\beta$ .

Weakness # 3 If the speaker does not believe that the stronger sentence is relevant to the subject of conversation, no quantity implicature is predicted to arise.

**Summary** For a pair  $\alpha, \beta$  where  $\neg\beta$  asymmetrically entails  $\alpha$ , the following material implication is a logical consequence of the conditions under which A can be correctly used:

(15) (The speaker believes that  $\neg\beta$  is relevant to the subject of the conversation) & (Either the speaker believes that  $\beta$  is true or the speaker believes that  $\beta$  is false)  $\rightarrow$  The speaker believes that  $\beta$  is true.

We can only reach our desired conclusion via two additional premises, which means that according to Gamut's machinery 'S believes that  $\beta$ ' is not strictly speaking a conversational implicature of  $\alpha$ .

In any case, the prediction is that we can infer 'S believes that  $\beta$ ' from the assumption that the speaker asserted  $\alpha$  correctly, *whenever* the two additional premises hold.

### Justifying the additional premises

Can we claim to have met the challenge? That is, have we succeeded in giving a plausible Gricean explanation of the phenomenon of scalar implicature? This depends on showing that the phenomenon indeed is dependent on the two additional conditions that we have needed in our argument. In other words, if the reasoning just presented is supposed to be a satisfactory explanation of the phenomenon, we have to confirm two predictions:

(a) The scalar implicature  $\beta$  does not arise in contexts where  $\alpha$  &  $\neg\beta$  is not relevant.

(b) The scalar implicature  $\beta$  does not arise in contexts where it cannot be taken for granted that the speaker has an opinion as to whether or not  $\beta$ .

Further, given the superficial impression that the inference to  $\beta$  is quite routinely made, we might expect that such contexts are hard to find.

- (16) A: How did your undergraduate class last semester go?  
 B: Some of the students found it interesting.  
 B': Some of the students told me they enjoyed it.
- (17) A: Where are the Power Bars that I bought last week?  
 B: I ate some of them.  
 A: How many?  
 B: Six.  
 A: Oh. I think I bought only six.
- (18) I met some of your Ph.D. students last night.
- (19) I have read some of your articles on presupposition projection.
- (20) A: How many children does Morton have?  
 B: Three.
- (21) Are you a widow or a divorcee?  
 Yes/No (Please circle one and only one answer)

**Summary** So far, it looks as if the derivation of scalar implicatures that we have spelled out (using Gamut's definitions plus two extra premises) is quite plausible. The two extra premises arguably do correspond to tacit assumptions that listeners need to rely on in order to draw the inferences in question.

## 2.4 The Symmetry Problem

We showed above how our premises yield the desired conclusion. But we have not actually made sure that the premises are all consistent. As we show next, this cannot be taken for granted at all. Let's assume (as above) that the following three conditions obtain:

- (a) S asserts  $\alpha$  correctly.
- (b) S believes that  $\neg\beta$  is relevant. ("Relevance")
- (c) S believes that  $\beta$  or S believes that  $\neg\beta$ . ("Excluded Middle")

As we already showed, (a) & (b) & (c) implies

- (d) S believes  $\beta$ .

Now,  $\alpha$  &  $\beta$  is also a sentence that asymmetrically entails  $\alpha$ . Therefore, (a) and Gamut's definition imply that not both of (e) and (f) can hold:

- (e) S believes that  $\alpha$  &  $\beta$ .
- (f) S believes that  $\alpha$  &  $\beta$  is relevant.

But (e) follows from (a) and (d). So (f) must be false.

What this means is that S must be taking  $\neg\beta$  to be relevant without taking  $\alpha$  &  $\beta$  to be relevant as well. E.g., in our example about boys at the party, S must think that *All the boys are at the party* is relevant, but *Some but not all the boys are at the party* is not relevant.

Does that make sense? Since we don't have a precise definition of relevance, we cannot show that it is a logical contradiction. But our informal understanding of what relevance means suggests that the following general laws should hold:

Whenever a sentence  $\phi$  is relevant, then its negation  $\neg\phi$  is also relevant.

Whenever  $\phi$  and  $\gamma$  both are relevant, then  $\phi \& \gamma$  is also relevant.

If we make these assumptions, then it cannot be that  $\alpha$  is relevant and  $(\alpha \& \neg\beta)$  is relevant, but  $\alpha \& \beta$  is not relevant. So S cannot believe this. So, given (a) & (b) & (c), (f) must be true. – contradiction

What we have shown in this abstract argument is this: Given plausible axioms about relevance, the “Excluded Middle” assumption is incompatible with the other two premises that we needed to derive the scalar implicature.

The problem can be made apparent by considerations that are less abstract and more intuitive. Consider the following example:

Assume that the domain of individuals under consideration contains just John and Mary.

- (22) Who called?  
 $\alpha$ : John called.  
 $\beta$ : John and Mary called.  
 $\gamma$ : John and not Mary called. (= Only John called.)

Suppose S asserts  $\alpha$ . Suppose further that the goal of the conversation is to give complete information about who called. I.e., every piece of information about the extension of *called* is relevant.

Now the listener might reason as follows: “S asserted that John called ( $\alpha$ ). The more informative statement that both John and Mary called ( $\beta$ ) would be equally relevant. I assume that S knows exactly who called. So if S did not assert  $\beta$ , she must think that  $\beta$  is false. So I infer that only John called, and Mary did not.”

But with equal legitimacy, the listener might also reason as follows: “S asserted that John called ( $\alpha$ ). The more informative statement that only John called ( $\gamma$ ) would be equally relevant. I assume that S knows exactly who called. So if S did not assert  $\gamma$ , she must think that  $\gamma$  is false. So I infer that not only John called, i.e. that both John and Mary did.”

Evidently, the listener can’t draw both of these inferences, since their conclusions contradict each other. But then, which one should he draw? There seems to be no good reason to draw one and not the other. Each is as good an instance of the kind of reasoning we have used above as the other. The only reasonable conclusion seems to be that S does not, after all, know exactly who called. If she knew anything more than that John called ( $\alpha$ ), she could not have used  $\alpha$  correctly. She would have had no choice but to make one of the stronger statements, either  $\beta$  or  $\gamma$ .

## Restrictions on Quantity Implicatures

Ideal solution to the symmetry problem: the problematic stronger propositions are ones for which there routinely exists a good reason not to assert them even if the speaker is convinced of their truth. But what would that good reason be?

Maybe, we need to take into considerations more rules about conversation than we have so far. After all, the principles we adopted from Gamut's reformulation of Grice's maxim left out quite a number of Grice's rules.

*Matsumoto* (1995) formulates his analysis as follows:

(23) *Conversational Condition*

A quantity implicature does not arise if the choice of the weaker statement instead of the stronger statement can be attributed to the observance of any information-selecting Maxim of Conversation other than the Quality Maxim and the Quantity 1 Maxim (i.e. the Maxims of Quantity-2, Relation, and Obscurity Avoidance, etc.).

We already saw that relevance doesn't distinguish between  $\beta$  and  $\gamma$ . Let us go through the other maxims then:

*Quantity 2* (Do not make your contribution more informative than is required.) Clearly, this won't help with choosing between  $\beta$  and  $\gamma$ . It couldn't really be that  $\gamma$  provides too much information while  $\beta$  doesn't. They seem to provide the same amount of information: for each of the two people in the domain,  $\beta$  and  $\gamma$  tell us whether they called.

*Manner 1* (Avoid obscurity of expression) *Matsumoto* illustrates the blocking effect that this maxim has on quantity implicature with an example that is close to Grice's example about the trip to the South of France:

- (24) A: What town is Bill living in?  
 B: He is living in a/some small town not far from Tokyo.  
 Does B implicate that B does not know exactly which of the small towns not far from Tokyo Bill is living in?

Again, our problematic  $\gamma$  is not obscure.

*Manner 2* (Avoid ambiguity) Neither  $\beta$  nor  $\gamma$  are ambiguous.

*Manner 3* (Be brief) This is the principle which some people have seen as the solution to the symmetry problem. Think of another instance of the problem:

- (25)  $\alpha$ : Some students were at the party.  
 $\beta$ : All students were at the party.  
 $\gamma$ : Some but not all students were at the party.

We could say that  $\gamma$ , although it asymmetrically entails  $\alpha$ , would be relevant, is not obscure or ambiguous, is not an alternative to  $\alpha$  that the quantity implicature mechanism applies to, simply because it is longer (more complex) than  $\alpha$ . The other competitor,  $\beta$ , on the other hand is equal to  $\alpha$  in length/complexity. An immediate empirical problem is that the story wouldn't apply in any obvious way to our initial example of the symmetry problem, where both  $\beta$  (John and Mary called) and  $\gamma$  (John but not Mary called) are longer than  $\alpha$ .

[Proponents of the brevity condition may say this shows that we are not dealing with a quantity implicature in that case.]



Matsumoto's counterexample:

- (26) It was warm yesterday, and it was a little bit more than warm today.  
implicature: It was not a little bit more than warm yesterday.

Matsumoto's conclusion: Brevity is not an information-selecting maxim. It does not choose between statements with different meanings. Hence, it does not interfere with quantity implicatures, contra Atlas & Levinson and others.

## Horn Scales

- (27) <all, most, many, some, few>  
 <and, or>  
 <n, . . . ,5,4,3,2,1>  
 <excellent, good>  
 <hot, warm>  
 <always, often, sometimes>  
 <succeed in Ving, try to V, want to V>  
 <necessarily p, p, possibly p>  
 <certain that p, probable that p, possible that p>  
 <must, should, may>  
 <cold, cool>  
 <love, like>  
 <none, not all>

Where do scales come from?

- Gazdar 1977: relevant alternatives must share selectional restrictions and item-induced presuppositions.
- Gazdar 1979: “scales are, in some sense, ‘given to us’” (p. 58).
- Atlas & Levinson 1981: same semantic field, same brevity, and lexicalized to the same degree
- Hirschberg 1985: items must form a “salient” scale in a given discourse

## Horn’s Condition on Scales

Horn (1989: Section 4.4 “Scalar Predication and Subcontrariety II”, pp. 231-252):

Positive and negative quantifiers, modals, and related operators must be represented on distinct, though related, scales. There can be no single scale on which operators like some and not all, or possible and unlikely, can be plotted. Rather, there is one scale defined by the positive operators and one by their negative counterparts. (1989, p. 235).

Horn’s Evidence: patterns like

- (28) not only a but b  
 not only warm but hot  
 not only some but all  
 not only John but John and Mary  
 #not only John but John and not Mary  
 #not only John but only John  
 #not only some but some and not all

Matsumoto suggests that “this condition is a part of the informativeness requirement on Horn scales”.

### **How to Refer to Scales in Quantity Implicatures**

(29) *Horn’s formulation of Scalar Implicatures (Horn’s 1972 Thesis)*

Given a quantitative scale and a speaker uttering a statement S which contains an element on this scale, then the listener can infer ...

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