

# Gricean calculations of embedded quantity implicatures

Chris Potts, Ling 236: Seminar in Lexical & Constructional Pragmatics, Fall 2009

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## 1 Overview

### The central goals of this handout

- i. Get a grip on what scalar implicatures are.
- ii. Map out the basic theoretical positions and their relationships.
- iii. Review Russell's (2006) arguments that embedded implicatures are expected under a Gricean account.
- iv. Highlight some of Geurts' (2009) conceptual and methodological points.

### Outline

§2 Background on Quantity/Quality interactions and scales

§3 Russell's (2006) methods

§4 Highlights from Geurts 2009

## 2 A bit of background

### 2.1 Characterizing Quantity/Quality interactions

**Strawson citing Grice** (who didn't get around to publishing for a while)

The earliest published indication appeared in 1952, in a footnote to Peter Strawson's *Introduction to Logical Theory*. In discussing the relationship between the statement 'there is not a book in his room which is not by an English author' and the assumption 'there are books in his room', Strawson draws attention to the need to distinguish between strictly logical relations and the rules of 'linguistic conduct'. He suggests as one such rule: 'one does not make the (logically) lesser when one could truthfully (and with equal or greater linguistic economy) make the greater, claim.' It would be misleading, although not strictly false, to make the less informative claim about English authors if in a position to make the much more informative claim that there are no books at all. Strawson acknowledges that 'the operation of this "pragmatic rule" was first pointed out to me, in a different connection, by Mr H. P. Grice.'

(Chapman 2005:94)

**Grice (1975)** identifies a meaning-creating clash between quantity and quality, with respect to a direct question:

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 prologation of his journey.

- (3) A.: Where does C live?  
 B.: Somewhere in the South of France (Gloss: There is no reason to suppose 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 maxim of Quality, 'Don't say what you lack evidence for', so B implicates that he does not know in which town C lives.)

**Levinson (1983)** defines quantity implicatures:

- (A) a. S has said  $p$   
 b. There is an expression  $q$ , more informative than  $p$  (and thus  $q$  entails  $p$ ), which might be desirable as a contribution to the current purposes of the exchange (and here there is perhaps an implicit reference to the maxim of Relevance)  
 c.  $q$  is of roughly equal brevity to  $p$ ; so S did not say  $p$  rather than  $q$  simply in order to be brief (i.e. to conform to the maxim of Manner)  
 d. Since if S knew that  $q$  holds but nevertheless uttered  $p$  he would be in breach of the injunction to make his contribution as informative as is required, S must mean me, the addressee, to infer that S knows that  $q$  is not the case ( $K\sim q$ ), or at least that he does not know that  $q$  is the case ( $\sim Kq$ ).

**Geurts (2009)** offers the following basic definition as a version of the standard one, though he argues that the relevant implicatures are neither always epistemic nor adequately characterized with these statements:

Scalar implicatures are supposed to work as follows. Clyde says:

- (1) Bonnie had some of the pears.

On the classical Gricean account, (1) means that Bonnie had at least some of the pears, and may implicate that she didn't have all of them. (Some authors — not I — would say that this implicature is standardly associated with the sentence.) This implicature is explained by assuming that the hearer reasons, and is entitled to reason, as follows:

- i. Rather than saying (1), Clyde could have said:  
 (1\*) Bonnie had all the pears.  
 Why didn't he do so?

- ii. The most likely explanation is that Clyde doesn't believe that (1\*) is true:  $\neg Bc(1^*)$ .
- iii. Clyde is likely to have an opinion as to whether (1\*) is true:  $Bc(1^*) \vee Bc\neg(1^*)$ .
- iv. Between them, (ii) and (iii) entail  $Bc\neg(1^*)$ : Clyde believes that Bonnie didn't have all the pears.

Actually, this derivation involves not one but two implicatures, one of which ( $\neg Bc(1^*)$ ) is weaker than the other ( $Bc\neg(1^*)$ ).

### Chierchia (2004)

Once introduced, implicatures are projected upwards and filtered out or adjusted, as the case may be, much like what happens with presuppositions. As a matter of fact, the history of the problem of presuppositions offers a good analogy. In that case too, it was thought early on that presuppositions constituted a purely pragmatic phenomenon, not amenable to a grammar driven compositional treatment (see, e.g., Kempson 1975). But eventually it turned out that such a treatment is, in fact, the one that gets us the better understanding of the phenomenon. In what follows, we shall, thus, sketch a projection algorithm for scalar implicatures.

**Not always epistemic!** Extending Geurts's (2009) (15):

- (B) Some of my cousins live in Belgium.
  - a. The speaker doesn't believe that all his cousins live in Belgium.
  - b. The speaker believes that not all his cousins live in Belgium.
  - c. The speaker thinks it would be

$$\left\{ \begin{array}{c} \text{impolite} \\ \text{improper} \\ \text{overly revealing} \\ \text{disadvantageous to him/you} \\ \dots \end{array} \right\}$$

to say whether all his cousins live in Belgium.

## 2.2 Horn scales

Horn scales, defined first in Horn (1972), are more or less conventionalized scales of lexical items organized by informativity (in some sense). Levinson (1983) gives the examples in (C), which you should handle with care:

- (C)
- < all, most, many, some, few >
  - < and, or >
  - < n, . . . , 5, 4, 3, 2, 1 >
  - < excellent, good >
  - < hot, warm >
  - < always, often, sometimes >
  - < succeed, *V*ing, 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 >

Horn (1989:232ff) gives Horn's (1972) original definition of scalar implicatures, which makes use of scales like the above, along with critical discussion of its details, and critical discussion of subsequent attempts by others.

**Pragmatic scales** Some theorists distinguish between the more or less lexicalized scales that follow from some general definition of entailment and the more particularized — “pragmatic” — scales that can crop up with particular speakers, or given particular discourse situations.

**Relativization** Even the apparently very conventional scales can reverse, or reorganize, in some discourse or morphosyntactic conditions. Think about cold/cool soda/coffee, or gain/lose *n* pounds while dieting/weight-lifting.

## 2.3 Approaches

Some of these approaches are easily combined. Others can be combined only if one divides the empirical area up a bit. (For example, you can be a localist about some implicatures, a defaultist about others, and a noncism about others still.)

**Griceanism** “non-truth-conditional aspects of meaning are read off the output of semantically interpreted logical form” (Horn 2006). Everything follows from general principles.

**Neo-Griceanism** Like Griceanism, but with modified maxims and perhaps some compromising (e.g., conventionalized scales) See Horn 1984.

**Localism** Some (scalar) implicatures conventionally attach specific lexical items and are derived as part of compositional semantic interpretation. See Chierchia et al. 2008.

**Defaultism** Some (scalar) implicatures are default inferences — presumptive meanings — that the hearer infers unless given reason not to by the speaker. For Levinson (2000), this means that the conventionally attach to certain lexical items. For Horn (2006), it just means that most context support the inferences (but you’ve still got to derive them pragmatically).

**Noncism** Scalar implicatures are derived via pragmatic mechanisms every time. That is, every inference of this form is the result of reasoning in terms of the meanings, the context, and the general pragmatic pressures.

### 3 Russell 2006

The enrichment of weak implicatures with contextual inferences in a global, Gricean framework correctly mirrors the observed fine-grained context-sensitivity of scalar implicatures. (p. 364)

One can read Russell 2006 as a challenge to the grammatical accounts of implicatures developed by Chierchia (2004), Fox and Hackl (2005), Fox (2006), and Chierchia et al. (2008), and the criticisms also apply, to some extent, to the defaultist position of Levinson (2000) and the Relevance Theory account of Carston (1988). However, one can also read Russell 2006 as simply a careful, detailed account of how complex patterns of scalar implicatures (i) are sensitive to the context of utterance, and (ii) can be derived from fundamentally Gricean assumptions. This handout concentrates on those aspects of the paper.

#### 3.1 Assumptions about Gricean implicature calculation

- (D)
- a. All calculations governed by the full set of maxims
  - b. Basic implicature:  $\varphi \Rightarrow \neg K\psi$ .
  - c. Expert strengthening: If the context includes  $K\psi \vee K\neg\psi$ , then we can infer  $\varphi \Rightarrow K\neg\psi$ .
  - d. The potential scalar implicatures for an utterance are delimited by the competitors for (the lexical items in) that utterance.
  - e. “a sentence’s scalar implicature cannot be strengthened if this leads to contradiction with another of its basic implicatures” (p. 371).

### 3.2 Non-factive embedding

(4) George believes some of his advisors are crooks.

**Empirical observation** Under normal circumstances, (4) implicates both (4a) and (4b).

- (4) a.  $\Rightarrow$  George believes not all of his advisors are crooks.  
 b.  $\Rightarrow$  It is not the case that George believes all of his advisors are crooks.

**Chierchia's claim** Gricean reasoning can deliver (4b), but not the stronger (4a).

#### Russell's reply

- (E) a. *Contextual assumption*: G. believes all his advisors are crooks or G. believes not all his advisors are crooks.  
 b. *Standard Gricean implicature*: (4b)  
 c. From (a), (b), and disjunctive elimination: (4a)

Furthermore, if we deny the contextual assumption, then the stronger implicature is absent:

- (5) George has not yet formed an opinion about all of his advisors, but, at this point, he believes some of them are crooks.  
 a.  $\not\Rightarrow$  George believes not all of his advisors are crooks.  
 b.  $\Rightarrow$  It is not the case that George believes all of his advisors are crooks.

### 3.3 Factive embedding

(6) George knows some of his advisors are crooks.

#### Chierchia's contention

- (F) The following are the meaning components of (6):  
 a. G. believes some of his advisors are crooks.  
 b. Some of G's advisors are crooks.  
 c. G. believes not all of his advisors are crooks.  
 d. Not all of G's advisors are crooks.

#### Russell's rejoinder

- (G) a. (Fa) is an entailment of *know*.  
 b. (Fb) is a standard presupposition of *know*.  
 c. (Fa) is derived (or absent) via the same reasoning we used in section 3.2.  
 d. (Fd) is weak, and cancelling it is easier/different than cancelling normal scalar implicatures, so it is "apparently distinct from scalar implicatures" (p. 366).

### 3.4 Comparatives

Comparative cases like the following are discussed by Wilson (1975), Carston (1988), Levinson (2000), Recanati (2003), Horn (2006), King and Stanley (2006).

(14) It is better to eat *some* of the cake than it is to eat *all* of it.

The usual contention is that these are contradictory on their unenriched meanings, so it must be that the implicature has crept in to become part of the basic semantics. For example, Levinson (2000) says that such examples “on a purely semantic basis should be self-contradictory” (p. 200) and worries that they “should (on semantic grounds alone) be nonsensical” (p. 202).

Russell says that examples like (14) are simply not semantically contradictory: phrases like *eat some/all the cake* are generics, with the *some* version crucially excluding situations in which all the cake was eaten, because these are not generic eat-some-cake situations. So the exclusive behavior of the implicature is built into the meaning of the phrases. In support of this view, Russell observes that the examples become marked if the predicates in question are not construed as generics.

#### Additional examples

(H) From Wilson 1975; Levinson 2000; Horn 2006; Geurts 2009:

- a. Driving home and drinking three beers is better than drinking three beers and driving home.
- b. It's not WARM, it's HOT!
- c. Drinking warm coffee is better than drinking hot coffee.

Geurts (2009) concludes that these are genuinely outside the bounds of a Gricean account: “I believe that, in cases like these, we are forced to admit that scalar terms give rise to local upper-bounding interpretations, which cannot be accounted for in terms of implicature; they are local quasi-implicatures” (p. 73).

### 3.5 Downward-entailing environments

The Gricean theory correctly predicts that downward entailing operators reverse the usual direction of scalar implicatures, in virtue of the fact that they reverse scales. For example, whereas *all* is stronger than *some* in upward-entailing contexts, the reverse is true in downward entailing contexts — i.e., *not some* is stronger than *not all*.

(I) Not all of George's advisors are crooks.  
 +> not(not some of his advisors are crooks)

#### Additional examples

- (J)
- a. George doubts that all of his advisors are crooks.
  - b. If George eats all of his vegetables, he'll get dessert.
  - c. No one ate a muffin and a banana.

### 3.6 Disjunction

(19) George ate some of the fries or the apple pie.

**Gennaro's generalization** Gricean theories wrongly derive (19b) as an implicature, when in fact only (19a) is present.

- (19) a.  $\Rightarrow$  It is not the case that G. ate all of the fries.  
 b.  $\nRightarrow$  It is not the case that G. ate all of the fries or the apple pie.

**Ben's** By (Db), (19) merely implicates (21), which entails (22a) and (22b).

(21) not(the speaker knows G. ate all of the fries or the apple pie)

- (22) a. not(the speaker knows G. ate all the fries)  
 b. not(the speaker knows G. ate the apple pie)

Implicature entailment (22a) can be strengthened via the expert inference if the context supports it. However, Russell says that (22b) cannot be strengthened, by assumption (De).

### 3.7 More than $n$ phrases

**Fox and Hackl's claim** Grice wrongly predicts that (26) implicates (27), in virtue of the fact that (28) is a stronger, equally marked alternative to (26).

- (26) Bill has more than four kids.  
 (27) Bill has exactly five kids.  
 (28) Bill has more than five kids.

Russell argues that we make only the weaker inference, and moreover that (27) is a competitor for (26), so we make an epistemic inference about it as well:

- (K) B has more than 4 kids.  $\Rightarrow \neg K(\text{B has } n \text{ kids}) \forall n > 4$   
 (L) B has more than 4 kids.  $\Rightarrow \neg K(\text{B has exactly 5 kids})$ .

Thus, we cannot invoke the expert assumption about (K), as this would contradict (L).

## 4 Geurts 2009

Geurts (2009) continues the arguments, conceptual and empirical, against grammaticizing scalar implicatures. He himself advocates a neo-Gricean account of everything except the intrusive cases we saw in section 3.4.

### 4.1 Deep arguments against defaultism and localism

Here is a rundown of the arguments that, it seems to me, don't have fixes for the defaultists and the localists:

**Scalar implicatures are not default inferences.** In fact, where the context is unbiased, people almost never draw them:

Paris's results are typical of what one finds in the literature: once contextual factors are factored out and the experimental paradigm is as neutral as possible, rates of scalar inferences are typically around chance level, give or take 10%. (p. 61)

**Multiplicatures** “some implicatures are derived not on the basis of a single proposition but from propositional ensembles” (p. 63).

(M) Q.: Which cities did you see on your trip to Italy?

A.: Clyde and I first went to Naples and Rome together. Then, while he went to see Venice, I visited Florence.

→ Bonnie saw only Naples, Rome, and Florence.

**Non-implicatures** Cases where we don't draw an implicature but the grammatical form is just like cases where we do. The following are Geurts' (18).

(N) a. I prefer to visit Tokyo or Kyoto

↯ I prefer not visiting both.

b. I hope that some of my relatives will remember my birthday

↯ I hope that not all of them will remember it.

c. Bonnie said that Clyde bought a new car or bicycle

↯ She said he didn't buy both.

## 4.2 A useful methodological point

The myth that scalar expressions prompt upper-bounding inferences by default is probably an artefact of the method that is most commonly used for collecting linguistic data: introspection. If we ask ourselves whether we would take an utterance of (13a) to imply that, according to the speaker, (13b) holds as well, it seems clear that we would:

- (13) a. Some of the goats have a cough.  
b. Not all of the goats have a cough.

However, this introspective method of collecting data on implicature is arguably biased (Geurts, 2006a [Geurts 2006 in this handout —CGP]; Geurts and Poussoulous, 2008). Obviously, to ask oneself whether or not (13a) implies (13b) is to suggest already that it might be implied, but more importantly, this question raises the issue whether or not all of the goats have a cough, or in other words, it makes it relevant to establish whether this is the case. And even if our intuitions about this case are dependable (which is as it may be), they do not necessarily tell us anything about how (13a) is interpreted in situations where this issue is not at stake. In short, the introspective evidence used to buttress claims to the effect that scalar inferences are defaults should not be taken at face value.

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