Implicature Cancellation and Exhaustivity

This paper is concerned with the question of whether implicatures are cancellable, and with how the answer to this question might adjudicate between neo-Gricean theories of implicature (e.g., Horn 1972, Geurts 2010) and the grammatical theory of implicature (e.g., Chierchia et al. 2008).

1. Background: Implicature Cancellation and Exhaustivity: It is commonly assumed that an essential feature of implicatures is that, unlike entailments, they can be *cancelled* (e.g., Horn 1972).

(1) John ate some of the cookies. In fact, he ate {# none / all} of them.

Magri (2009, 2011) (henceforth **M**) argues that the oddness of texts like (2) (from Schlenker (2006)) teach us that implicature computation is mandatory and uncancellable.

(2) # Mary gave the same grade to all her students. She gave some of them an A.

If the second sentence in (2) ($\exists$) is obligatorily interpreted with its scalar implicature ($\neg\forall$), then the oddness can be explained as a consequence of a contradiction between the strengthened meaning of the second sentence ($\exists \wedge \neg\forall$) and an entailment of the first sentence ($\exists \equiv \forall$), much like (3).

(3) # Mary gave the same grade to all her students. She gave only some of them an A.

If implicatures could be cancelled, the contradiction in (2) could be avoided by cancelling the implicature. Since (2) seems as doomed to oddness as (3), **M** argues that implicatures must be computed and, once generated, cannot be cancelled. To make sense of the apparent cancellability of implicatures, as in (1), he argues that what looks like cancellation is really just the hearer treating the stronger alternative as irrelevant, in which case no implicature is expected (on any theory). (The hearer is unable to treat $\forall$ as irrelevant in (2) because of a constraint on relevance **M** proposes; for space considerations we do not discuss this here). Since it is commonly assumed that an essential property of pragmatic inferences is that they are cancellable (Grice 1967), **M** suggests that the best way to make sense of the mandatoriness of implicature computation is to assume that implicatures are computed by a silent exhaustive operator, exh (with a meaning assumed to be essentially that of *only* – see e.g., Fox 2007), together with the assumption that sentences are *always* exhaustified (parsed with exh). If **M** is correct, the pattern in (1)-(3) argues in favor of the grammatical theory of implicature. To our knowledge, there is no neo-Gricean account of this pattern.

2. Contributions of this paper: This paper aims to: (**A**) Provide empirical support for **M**'s claim that when an alternative is relevant the corresponding implicature cannot be cancelled. (**B**) Argue that, contra **M**, the conclusion in (**A**) does *not* undermine neo-Gricean theories of implicature. Specifically, we will argue (against the common interpretation) that the neo-Gricean Maxim of Quantity actually entails that implicatures must be computed. If this is right, there is no need to assume exh in the account of (1)/(2). (**C**) Provide evidence that ignorance inferences that are independent of exhaustivity are also mandatory and uncancellable, thereby supporting the conclusion that neo-Gricean reasoning is mandatory and uncancellable independent of whether exh is responsible for implicature computation. (**D**) Derive Hurford's Constraint (HC, Hurford 1974) on disjunctive sentences. HC has been used to motivate the existence of exh, but it has no obvious pragmatic motivation. We will argue that the data that motivated HC can be *derived* (without having to stipulate HC) as consequences of (**C**) together with the assumption natural languages do in fact have access to exh; without exh and (C) the data lack a principled explanation.

A. Relevance and Cancellation: **M** proposed that cancellation should be reanalyzed as the effect of ignoring an alternative by treating it as irrelevant, but did not provide evidence independent of his purposes to support this. When we force an alternative to be relevant (e.g., by asking a question that makes it relevant), **M**'s suggestion that cancellation is impossible seems to be supported.

(4) A: How many of the cookies did John eat?

B: # He ate some of them. In fact, he ate all of them.
(5) A: What did Mary eat at the party?
B: # She ate beef or pork at the party. In fact, she ate both.
B. Cancellation and Quantity: While it is commonly assumed that implicatures should be cancellable, we argue that this assumption is actually inconsistent with the neo-Gricean Maxim of Quantity (NG-MQ). Here is a statement of NG-MQ modelled after (e.g., Gamut 1991, Fox 2007): *If S, S' are alternatives, both are relevant, and the speaker knows that both are true, then if S' is stronger than S, the speaker must assert S'.* If it turns out that the speaker used S instead of S', then so long as they are alternatives and are both relevant, it follows deductively (by modus tollens) that the speaker does not know that S'. Together with the further assumption that the speaker is opinionated about S', it follows that $\neg S'$. What is important is that there is no room for cancellation here; if the maxim is right, implicatures follow as deductive consequences of the assumption that the speaker is following the maxim. That is, it follows from NG-MQ that the only way for S' to not become an implicature of S is for S' to be treated as irrelevant when S is asserted. Thus, neo-Gricean theories of implicature fare just as well on (1) and (2) as **M**'s exhaustivity-based proposal.
C. Ignorance Inferences Cannot be Cancelled: Sentences 'A or B' and 'if A, B' are known to give rise to inferences that the speaker is ignorant about A ($\neg\Box_S A \wedge \neg\Box_S\neg A$; abbreviate this as $I_S(A)$) and is ignorant about B (e.g., Gazdar 1979, Sauerland 2004). If, as argued above, neo-Gricean reasoning is mandatory, then, contrary to standard assumptions (e.g., Gazdar 1979), ignorance inferences (I-INFs) should also be mandatory and uncancellable. Here is some evidence that they are (see also Sauerland 2004, Singh 2010, Magri 2011):
(6a) John has two or more sons. # In fact, he has more than two sons.
(6b) # If John is married to an American, he has two sons. # In fact, he has two sons.
Since the ignorance inferences of 'A or B' and 'if A, B' arise whether or not they are parsed with exh (Fox 2007), (6a,b) show that neo-Gricean reasoning is mandatory whether or not exh exists.
D. Deriving Hurford's Constraint We have argued that an explanation of the data above does not demand the existence of exh. The existence of exh has, however, been supported by a pattern of data surrounding Hurford's Constraint (HC, Hurford 1974) and its obviation (e.g., Chierchia et al. 2008). HC states that disjunctions 'A or B' are odd if one of the disjuncts entails the other.
(7) # John was born in Paris of France ($P \vee F$; note that, given common knowledge, $P \vee F \equiv F$)
Gazdar (1979) noted that HC is obviated when the entailing disjuncts are scalar alternatives of one another (see also Simons 2000); if HC is correct, then (8) is a puzzle.
(8) John ate some or all of the cookies (henceforth $\exists \vee \forall$; note that $\exists \vee \forall \equiv \exists$)
It has been argued that the puzzle can be solved with the assumption that embedded implicatures exist and are computed by exh (e.g., Chierchia et al. 2008). Specifically, assuming HC is correct, its obviation in (8) can be explained by the assumption that the first disjunct is parsed with an exh (resulting in parse $[[exh(\exists)] \vee \forall]$), which in turn breaks the entailment between the disjuncts (since the first disjunct now means $\exists \wedge \neg\forall$). For this account to work HC needs to be stipulated as primitive, but without any obvious motivation for the constraint the explanation remains unsatisfactory. The result in **C** allows us to capture the contrast *without* having to stipulate HC. Recall that disjunctions $X \vee Y$ mandatorily give rise to I-INFs $I_S(X)$ and $I_S(Y)$. In (7) one of the I-INFs, $I_S(F)$, contradicts the assertion $\Box_S(P \vee F) \equiv \Box_S(F)$ (we assume assertion of X licenses the inference $\Box_S(X)$). In (8) we would expect contradiction also, since the I-INF $I_S(\exists)$ contradicts the assertion $\Box_S(\exists \vee \forall) \equiv \Box_S(\exists)$. However, if exh exists, the first disjunct can be parsed as $exh(\exists)$, and there is no contradiction between the I-INFs $I_S(\exists \wedge \neg\forall)$, $I_S(\forall)$, and the assertion $\Box_S(exh(\exists) \vee \forall) \equiv \Box_S(\exists)$.