A Gricean View on Intrusive Implicatures
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0. Introduction

This paper will explore one of the long-standing objections to Grice's account of conversational implicature: the case of purported implicatures which are apparently generated by subordinate clauses, or which fall under the scope of a logical operator (typically both). Such cases, for reasons to be detailed below, pose a challenge to Grice's account. While those who have posed the challenge, ranging from advocates of truth conditional pragmatics to strict compositionalists, have a wide variety of views as to the correct account of the data, they are united in reaching the same negative conclusion: that Grice's account cannot be extended to intrusive implicatures.

    In this paper, I will argue for a different conclusion. I will suggest that there is a natural modification of Grice's model which allows for the generation of implicatures from non-asserted sentence-parts. The goal of the paper is to articulate this modification and apply it to some sample cases. This will be done in part 2 of the paper. In part 1, I will introduce the cases to be investigated and explain in a little more detail what issues they raise.

Part 1: The Issues

1.1. Two illustrative cases
We begin by introducing two cases which are taken by many as paradigm cases of conversational implicature: conjunction buttressing, and scalar implicatures.[1] Conjunction buttressing is illustrated in (1) and (2):

(1)   The old king has died of a heart attack and a republic has been declared.
(2)   Jane was in a car accident and she broke her leg.

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[1] I choose these two cases because they have been very widely discussed in the literature. In particular, scalar implicatures are at the heart of a very vigorous current debate about the structure of the interpretative process. However, even if one is convinced that there are conversational implicatures of the standard Gricean sort, one might not be convinced that these two cases are best explained in Gricean terms. The enriched interpretation of coordination, for example, might seem better explained within a general theory of coherence. Questions can also be raised about the standard account of scalar implicatures. Happily for me, the argument I will present below is unaffected by the question of whether these particular cases are correctly analyzed in Gricean terms. The argument I will give is an argument that the principles for the calculation of conversational implicatures are equally applicable to complete utterances with speech act force and to sub-parts of utterances. Whether these principles are actually applied in any specific case is tangential to my argument.

(1) is most naturally understood as claiming that the declaration of the republic followed the death of the king; there is perhaps a further implication that the death of the king facilitated the declaration of the republic. Similarly, we understand (2) as saying that Jane broke her leg as a result of the car accident. Various arguments have been offered to establish that these implications of temporal ordering and of causal relations are not part of the meaning of the sentence itself, and in particular that they are not determined by the lexical meaning of *and*. Instead, these can be accounted for in Gricean terms as implicatures generated by the Maxim of Manner.[2]

Sentence (3) is a typical example of scalar implicature:

(3)   The guests stole some of the teaspoons.[3]

The sentence has a natural reading that is stronger than that provided by the literal meaning alone. While (3) seems to be strictly speaking true if in fact the guests stole many, most or all of the teaspoons, an utterance of this sentence would normally convey that the guests stole some of the teaspoons and no more than some. The implication of upper boundedness can be accounted for as a Gricean implicature, this time generated by the first part of the Maxim of Quantity (Quantity 1).

This particular case of Quantity implicature is known in the linguistics literature as a *scalar implicature*. This name is given to any cases of Quantity implicatures that are generated by virtue of the use in a sentence of a lexical item which is a member of a *Quantitative Scale*, a concept originally invoked by Horn 1976, defined as follows (following Gazdar 1979):

> Let Q be an n-tuple of expressions $\langle e_0, e_1,...e_n \rangle$. Let S_i be a sentence containing the expression $e_i \in Q$, and let S_{i+1} be a sentence just like S_i except that e_i is replaced by the subsequent element of Q, e_{i+1}. Then if Q is a quantitative scale, S_i entails S_{i+1}, as long as e_i and e_{i+1} are not within the scope of an operator.

Sentences containing scalar items give rise to implicatures in a very systematic way: an utterance of a sentence S containing a scalar item α typically implicates that, as far as the speaker knows, any sentence S' in which α is replaced by a stronger element in the same scale is not true.[4]

1.2.   Embedded implicatures

Starting with Cohen 1971, various authors have pointed out that there are cases in which the purported implicature which would normally be associated with an assertoric utterance of a particular clause remains when that clause is uttered as an embedded constituent in a complex sentence. Here, I focus on cases of apparent embedding of the two types of implicature introduced above; and I examine three different embedding configurations: antecedents of conditionals, complements of an attitude verb, and disjunctions. So, consider:

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[2] For details of the Gricean account, see Levinson 1983, pp.107-108.

[3] I avoid using examples involving numerals, because of debate as to their truth conditional content. See for example Sadock 1984, Koenig 1991, Horn 1992. I also have some doubts about purported entailment relations in other cases of scalar implicature (e.g. that *hot* entails *warm*); so I will use quantifier examples throughout.

[4] This description involves simplifications. For a more careful presentation, see either of the references in the text, or Sauerland 2004.

(4)   If the old king has died of a heart attack and a republic has been declared, then Tom will be quite content. (Cohen 1971)
(5)   Bill believes that some of his students are waiting for him. (Chierchia 2004)
(6)   Either Kai ate the broccoli or he ate some of the peas. (Sauerland 2004)

As argued by Cohen 1971, the implication of temporal ordering and causal connection observed in (1) above is part of the content of the antecedent of (4). Chierchia 2004 argues that an utterance of (5) attributes to Bill the belief that some and not more than some of his students are waiting for him. Similarly, he argues that the second disjunct in examples like (6) implicates that Kai did not have more than some of the peas.[5]

These claims have been disputed. The debate is difficult, because it often turns on questions about speakers' ability to distinguish literal meaning from a nonliteral interpretation assigned to an utterance.[6] My goal here is not to resolve the dispute, but to ask whether a resolution of the dispute in favor of the claims of Cohen, Chierchia and others who share their intuitions forces us to abandon a generally Gricean view of the inferences in question. For the sake of that argument, I will simply accept the claims that these inferences indeed fall under the scope of the relevant operators and contribute to the literal meanings of the sentences in question.

1.3.   Two problems for the Gricean perspective
The examples under consideration raise two distinguishable problems for the standard Gricean view. The first problem I call the *calculation problem*, and it is this: Grice's account of the calculation of conversational implicatures does not provide a means for the calculation of implicatures from non-asserted clauses.

For Grice, conversational implicatures are aspects of a speaker's meaning derivable by an interpreter, not from the conventional content of the words and sentences that the speaker used, but from the observation that the speaker has said what she said in the particular conversational context in which she said it. When Grice characterizes the notion of conversational implicature, he begins: "A man who, by (in, when) **saying** (or making as if to say) that *p* has implicated that *q*..." (Grice 1989: 30). Later, when he provides a general schema for the calculation of conversational implicature, he similarly begins: "[The speaker] has **said** that *p*; there is no reason to suppose that he is not observing the maxims...; he could not be doing this unless he thought that *q*..." (p.31). So, saying what you say comes first; conversational implicatures come after.

Grice had something very specific in mind in his use of the term "saying," something, as he puts it (1989: 25) "closely related to the conventional meaning of the words (the sentence)." Neale (1992), in his careful analysis of Grice's work, concludes that Grice nowhere provides a definitive formulation of his notion of what is said. However, Neale extracts from Grice's writings the following "preliminary" definition:

(7) By uttering X, U **said** that *p* iff:
      a.   by uttering X, part of what U meant was that *p*.

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[5] As we'll see below, Sauerland considers this an implicature of the sentence as a whole, and therefore not a challenge to the standard picture.

[6] For a thorough review of the debate, see Recanati 2004.

b. X consists of a sequence of elements (such as words) ordered in a way licensed by a system of rules and

c. X means "*p*" in virtue of the particular meanings of the elements in X, their order and their syntactical structure.[7]

Clauses (b) and (c) serve to connect what is said to what is conventionally meant, what is conveyed by virtue of "the particular meanings of the elements in X." Clause (a) ties what is said to what the speaker meant. Now, recall that for Grice, in the case of an indicative utterance, what a speaker means is, roughly, what she intends to get the hearer to believe.[8] It is thus a notion closely aligned with what is asserted. So, connecting this back to the definition of conversational implicatures, we see that a conversational implicature generated by an indicative utterance is calculated on the basis of what a speaker has asserted.

This understanding of Grice's account of conversational implicatures leads to the following conclusion: non-asserted sub-parts of an indicative utterance should not themselves give rise to conversational implicatures. Recanati 2003 cites an argument given by Anscombre and Ducrot for this conclusion:

(a) Conversational implicatures are pragmatic consequences of an act of saying something.
(b) An act of saying something can be performed only by means of a complete utterance, not by means of an unasserted clause such as a disjunct or the antecedent of a conditional.
(c) Hence, no implicature can be generated at the level of an unasserted clause.

In light of this, consider again the scalar implicature examples (5)-(6) above, repeated here:

(5)   Bill believes that some of his students are waiting for him.
(6)   Either Kai ate the broccoli or he ate some of the peas.

Let's focus first on (6). According to Sauerland, an utterance of (6) implicates that Kai did not eat all of the peas. Intuitively, that implication is generated by the second disjunct – in particular, by a comparison of that disjunct (or its content) with (the content of) "Kai ate all of the peas." But as a speaker of (6) does not *say* that Kai ate some of the peas, there are no grounds for generating any implicature from that clause (or its content). Nor can the implicature be generated from the content of the utterance as a whole by standard assumptions.[9]

The same is true for (5). As Chierchia points out, standard accounts predict that if this sentence gives rise to a scalar implicature, it is this:

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[7] As Neale observes, this definition fails to distinguish what is said from what is conventionally implicated. This distinction need not concern us here, however.

[8] The definition of this notion, too, is fraught with difficulty. See in particular Essays 5 and 6 in *Studies in the Way of Words*, and Neale's 1992 explication.

[9] For details as to why this is so, see Sauerland 2004. In section 5.1. below, we will discuss Sauerland's own account, which proposes a modification of standard assumptions to allow for the generation of this implicature from the utterance as a whole. But we will also raise doubts as to whether it is appropriate to understand the implicature in this way.

(8)   It is not the case that Bill believes that all of his students are waiting for him.

This, though, could be true if in fact Bill had no beliefs at all as to whether all of his students were waiting for him. The observed implicature, that Bill believes that not all of his students are waiting for him, cannot be generated directly from the asserted content of (5), but only from the clause embedded under *believe*. But, as the content of this clause does not count as *said*, then it should not trigger any implicature calculation. This, then, is the calculation problem.

Sentences (4) and (5) also demonstrate the second problem, which I call the *compositionality problem*. There are two ways to characterize this problem, depending on whether one is interested solely in the consequences of intrusive implicatures for Grice's views, or for the theory of interpretation more generally. Starting with the Gricean perspective, the compositionality problem is this: According to Grice, what is said is supposed to be determined by conventional content (in addition to reference fixing and disambiguation).[10] But in examples like (4) and (5), the implicatures apparently generated by embedded clauses seem to fall under the scope of the embedding operators, and thus to contribute to the truth conditional content expressed: that is, to what is said. Consider (4) again, repeated here:

(4)   If the old king has died of a heart attack and a republic has been declared, then Tom will be quite content.

As Cohen points out (p.58), the truth of this sentence seems compatible with Tom being not at all content if a republic had been declared first and then the old king had died of a heart attack. If this is so, then the temporal ordering of the events is part of the truth conditional contribution of the antecedent.

As Cohen further points out, the intrusion of the implicature into the content of the antecedent seems to place Grice in a double bind. Suppose that we find a Gricean solution to the calculation problem, generating the observed implication as an implicature of the embedded clause. This still does not explain how this implication comes to affect the truth conditions of the conditional as a whole. For the conditional operator is itself supposed to be truth functional, at least in the sense of having access only to the truth conditional (conventional) content of the component clauses. But if this were so, then the implicature could not find its way into the truth conditions. As Cohen puts it (p.58): "The truth functionality of *and* in cases like [(4)] could only be maintained at the cost of sacrificing the truth-functionality of 'if...then...'"

So, whether or not one is concerned with Grice's conception of what is said, intrusive implicatures pose a problem for the truth functional view of linguistic operators, and for the thesis that the determination of truth conditional content is strictly compositional. There is thus a good deal at stake in the investigation of these rather commonplace examples.

There has been a wide range of responses to the phenomena discussed here.[11] On the one hand, advocates of Truth Conditional Pragmatics, including the Relevance Theorists (following Sperber and Wilson 1986), reject Grice's conception of what is said and any view which excludes the possibility of nonconventional content contributing to literal meaning. In particular, the interpretation of scalar items is typically taken by relevance theorists to be semantically

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[10] As many authors have pointed out, this caveat is non-trivial. For one discussion of this point, see Levinson 2000, section 3.2.

[11] For a helpful summary and discussion of responses, see Recanati 2003.

indeterminate. The actual interpretation in a given case is argued to be determined by contextual factors.

In a very different approach, Gennaro Chierchia (Chierchia 2004) attempts to maintain (a version of) semantic compositionality by arguing that scalar implications are not in fact Gricean implicatures, but are generated by grammatical rule in the course of semantic composition. This allows him to maintain an overall Gricean perspective: first, conventional content and grammatical rules provide a literal content for an utterance. This content can then provide the input to a Gricean process of implicature calculation.

Falling somewhere between these two views is Levinson's Default Interpretation view (Levinson 2000). Like the Relevance Theorists, Levinson argues that nonconventional content can make a truth conditional contribution. However, he argues that such cases typically involve what he calls Generalized Conversational Implicatures, implicatures which, although explicable in terms of general conversational heuristics, are associated by default with particular expression or construction types. Default interpretations can always be overridden by global conversational considerations of a Gricean sort; but their initial generation is noninferential and automatic.

As noted, what is common to these responses is an assumption that the general framework provided by the Cooperative Principle and the maxims of conversation cannot be modified to accommodate the troubling data. In the next section of the paper, I will suggest that they can. In doing so, I will offer a solution to the calculation problem posed by intrusive implicatures. The solution I propose does not attempt to preserve Grice's notion of what is said or the compositionality of literal content. The goal is only to make plausible the idea that Gricean principles can apply to non-asserted subparts of sentences.

Part Two: The proposal

3. Implicatures from non-asserted clauses: Walker 1975

Grice's account of the workings of Cooperativity, combined with his views on the determination of "what is said," indeed seems to fail to account for cases of embedded implicatures. One response to this conclusion is to reject Grice's account altogether, or at least reject it as being in any way applicable to these difficult cases. Another response is to consider modifications of Grice's view that might allow resolution of the difficulties.

The latter seems a perfectly reasonable approach. There is no reason why, as theorists, we have to take Grice's views as an unseparable whole. The fundamental ideas underlying the notion of implicature are clearly separable from Grice's expressed views about the nature of "what is said" and about the semantic content of particular items. For example, Grice argued that natural language conditionals have the semantics of material implication, and used the notion of conversational implicature to try to make this view plausible. Formal linguists have by now (I think) universally rejected this account of conditionals; but this does not prevent us from maintaining a Gricean account of conversational inference. Similarly, the Cooperative Principle and the associated maxims are a first stab at formulating the appropriate principles, not the last word on the matter.[12] One can maintain a broadly Gricean outlook while modifying the details of the account of how implicatures are generated.

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[12] Thomason (1990: fn.20), recalling that the proposal in Grice 1967 was offered as a rather preliminary outline and with some tentativeness about details, writes: "On the whole, I believe that linguists and computer scientists have taken the details of Grice's theory more seriously than they perhaps should have."

Recanati 2003 suggests (and ultimately rejects) one such modification. The idea is to "construe ... implicatures as pragmatic implications of something other than a self-standing speech act" (p.311). As Recanati reports, a version of this modification is proposed in Walker 1975.[13] Walker writes:

> [The Conversational Hypothesis] holds that by a particular utterance on a particular occasion the speaker can convey more than his utterance strictly means through relying on a general recognition of Grice's Cooperative Principle. It is therefore concerned with utterances, whether they constitute self-standing speech acts or not; an utterance of a subordinate clause, as in the antecedent of a conditional, is still an utterance, and therefore may convey conversationally more than it literally means. It may convey, for example, a further condition on which the consequent is taken to depend. (151; also cited by Recanati)

Walker takes this approach in response to Cohen's (1971) objections to Grice's proposal. In his response, he takes on both the calculation problem and, in a rather roundabout way, the compositionality problem. The passage quoted above constitutes the response to the calculation problem. He provides a more detailed discussion of this problem as it arises in Cohen's examples of coordination in the antecedent of a conditional. The central example is repeated in (9) below:

(9)   If the old king has died of a heart attack and a republic has been declared, then Tom will be quite content.

Walker argues as follows: The implication of temporal ordering between the conjuncts is generated by the requirement to be orderly. This requirement is in force in any conversational context where the order of the events is of conversational relevance. He continues:

> In the normal conversational context of [(9)] the order of the events is as important to the purposes of the talk-exchange as it is when 'The old king has died of a heart attack and a republic has been declared' is asserted by itself. (138).

So, the maxim applies just as well to the antecedent of the conditional, and the implication is generated.

Recanati extends Walker's account to the case of clauses embedded under *believe*, as in (10):

(10)   Paul believes that the old king has died of a heart attack and a republic has been declared.

Echoing Walker, we can say that in a normal conversational context in which (10) might be uttered, Paul's beliefs about the temporal ordering of the events are relevant, and so should be part of what is conveyed by the belief claim. Thus, as Recanati writes, "the speaker's describing the two events in that order suggests that, according to Paul, they took place in that order" (p.312).

So, Walker addresses the calculation problem by arguing that the purposes of a talk exchange may impose constraints on the formulation of subordinate clauses as well as main clauses, and thus

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[13] Walker himself doesn't seem to have considered his proposal a modification of Grice's views, but merely an articulation of them. However, in this he is at odds with the generally accepted interpretation of Grice.

that the conversational maxims are applicable to subordinate clauses too.[14] Walker is not the only theorist to have suggested this strategy. Green 1998 (fn.40) argues that "nothing in the Gricean apparatus precludes calculation of what a speaker could have intended to convey in uttering a clause that is not put forth with any illocutionary force, say by virtue of that clause occurring in the consequent of a conditional or under the scope of negation."[15]

The goal of this second half of the paper is to try to extend Walker's proposal into a general solution to the problem of embedded implicature.

4. Developing the account: The status of embedded clauses

Walker's argument is founded on intuitions about specific cases. In these specific cases, and given the specific conversational principle involved (i.e. orderliness), it seems quite justifiable to claim that the principle is applicable to the specific case of an embedded clause. But there is, I think, a more general case to be made for the position.

The basis for the general case is that subordinate clauses do not serve merely to contribute to the propositional content expressed in an utterance. Typically, these clauses themselves serve identifiable discourse functions. Cooperativity requires these functions to be fulfilled as well as possible. To put this a different way: interpreters can pay attention to parts of sentences independently of the containing sentence, and can reason about why the speaker produced just that sentence-part in attempting to convey her communicative intention. This reasoning, I suggest, is what gives rise to 'local' conversational inferences.

In support of the claim that non-asserted clauses can have a certain independence, consider the discourse behavior of sentences containing main verbs with sentential complements, such as propositional attitude verbs and verbs of saying. I have argued elsewhere (Simons 2007) for the conjunction of two claims:

(11)   Given an utterance of a sentence of the form *x V that p*:
  a. What is asserted is that x V that p.
  b. The proposition that *p* may be proffered as main point content.

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[14] Walker's discussion also addresses the compositionality problem; but here, I think, his proposal is off target.

[15] Green takes issue with Recanati's claim, reiterated above, that Grice himself conceived of conversational implicatures only as "pragmatic consequences of acts of saying something." Green points out that in the 'Retrospective Epilogue,' Grice wrote:
> It certainly does not seem reasonable to subscribe to an absolute ban on the possibility that an embedding locution may govern the standard nonconventional implicatum rather than the conventional import of the embedded sentence... (Grice 1989: 375)

But it must also be acknowledged, I think, that in his primary presentations of conversational implicature, Grice writes only of them being generated on the basis of observations about what is *said*. In retrospect, he may indeed have thought that a more flexible theory was required. Note also that in this remark, Grice is envisioning embedding of "standard" implicatures – presumably, generalized ones – and also thinking of cases where the operator operates on the implicature *instead of* the standard content. The proposal laid out below does not limit itself in this way.

First, note that I distinguish what is asserted from the utterance's main conversational point. This means that a speaker may contribute the proposition that *p* to the conversation without actually asserting *p* or becoming committed to its truth. The clearest example of this is in answers to questions. Consider any of the sentences in (13) offered as answers to the question in (12).

(12)   Where did Jane go last week?
(13)   a.   Henry believes she was interviewing for a job at Princeton.
           b.   Henry thinks she was interviewing for a job at Princeton.
           c.   Henry said she was interviewing for a job at Princeton.
           d.   Henry hinted she was interviewing for a job at Princeton.

It is the content of the subordinate clause which, in each case, constitutes an answer to the question. This in turn provides us with evidence that this content constitutes the main point of the utterance. The main clause serves an evidential function, indicating the source of the proffered information and the degree of confidence of the source in the truth of the claim.[16] By so embedding the proffered content, the speaker avoids committing herself to its truth. An interpreter can, nonetheless, take up this embedded content in her response. She might, for example, say: *But she wasn't. I know, because Bob already told me who they're interviewing.*

These examples show that an interpreter can "access" the content of a non-asserted sentence-part – at least, of a clausal complement – and treat it in some sense as if it were independent of the larger clause in which it is embedded.

There are two, not mutually exclusive, ways to think about how the interpreter "retrieves" the embedded content and responds to it as if it were independent. We might tell a purely inferential story along the following lines:

> *I have asked a question about where Jane went. The speaker responds with an assertion about Henry's belief. This does not answer my question. But the content of the belief is relevant to my question. Therefore, the speaker intends me to pay attention to the content of Henry's belief.*

Alternatively, we might suppose that access to the embedded proposition is more direct: that the interpreter immediately recognizes the utterance as having two parts: a part which mentions that Henry has a particular belief, and a part that characterizes that belief. Now, the inferential story is still needed to explain how the interpreter knows, furthermore, that the intended answer to the question is provided by the content of the belief, while the main clause content serves an evidential function. But here we add the idea that the embedded clause is immediately recognized has having a particular function within the sentence itself, namely, the function of characterizing Henry's belief.

I don't see any reason to think that competent speakers of a language couldn't do this – in fact it just seems rather obvious that they can. So I will make this assumption in the discussion that follows. This does have a consequence: given this assumption, I allow that recognition of the function of the subordinate clause does not require the presence of conversational factors that force this clause into main point status, or anything similar.

We can now reconsider Walker's account of the Cohen example (9) in this light. First, let us see whether there is evidence that the antecedent of a conditional can serve a discourse function

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[16] The observation that embedded clauses can have a main point content and embedding clauses an evidential function goes back at least to Urmson 1952.

independent of the full sentence in which it appears. There is indeed a robust intuition that it does: that an interpreter recognizes the antecedent of a conditional as presenting the hypothetical circumstances in which it is claimed that the consequent would (or might, should, and so on) hold. This intuition is reflected in standard contemporary accounts of the semantics of conditionals, in both static and dynamic semantics. In dynamic semantics (see e.g. Stalnaker 1974, for an early informal formulation; Heim 1992 for a formalization), a standard approach involves a stage at which the context is updated by the content of the antecedent.[17] In static semantics, for example Kratzer 1991, the antecedent of a conditional serves to restrict the set of worlds in which the consequent must be true.

A formal semantics for conditionals of course may not correspond to what an interpreter actually retrieves in understanding a conditional. However, it is pretty clear that in ordinary talk, interlocutors can respond to the content of an antecedent independently of the total assertion. A discourse such as the following is totally natural:

(14)   A: If Jane comes later, we can fill her in.
         B: She won't be coming.

Note that in this case, the second speaker seems to take the first to raise the question of whether Jane will come later. Although conditionals can serve a range of discourse functions, it seems generally true that their antecedents have the potential of introducing a new question, or topic, for discussion in the discourse. As noted by Groenendijk and Stockhof 1984, this is what makes sequences such as the following felicitous:

(15)   A: What's the weather going to be like today?
         B: If Bill took his umbrella, it's going to rain.

Clearly, the conditional is not an answer to the question; but it provides a strategy for arriving at an answer, namely, by answering the question raised by the antecedent of the conditional.

What examples such as these show is that at the very least, an interpreter is able to identify the content of an antecedent clause, and make use of it or respond to it independently of the conditional that the speaker asserts. Returning then to the Cohen example, we can say just what Walker does: the interpreter can be assumed to recognize that the antecedent clause provides a representation of the circumstances in which it is claimed that Tom will be happy. The interpreter can further assume that the speaker has given the best, most cooperative representation of those circumstances that she can. A good representation is an orderly one; therefore, the interpreter can presume that the speaker has abided by the orderliness requirement of the Maxim of Manner.

It is perhaps entirely obvious that an interpreter has access to the content and function of the antecedent of a conditional. I belabor the point only because the standard Gricean account of conversational inference seems to ignore it, assuming, as we have already noted, that only the total content of what is said can serve as the input to conversational reasoning. But if in fact an interpreter recognizes simultaneously that a speaker has asserted a proposition p with form F and has also

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[17] Recanati (2003) suggests that this approach, at least as articulated by Stalnaker, constitutes a commitment to the idea that (the utterance of) the antecedent constitutes an independent speech act. This idea, in turn, leads to an alternative solution to the problem of embedded implicatures. I am not here advocating this approach.

expressed proposition q in form F' to do it, I see no reason to rule out the possibility of reasoning conversationally about this second observation.

5. Disjunction

We can make the following generalization: If a given clause gives rise to a scalar implicature when it occurs unembedded, it will typically give rise to the same implicature if it occurs as a disjunct in an *or* coordination. Similarly, a conjunction that gives rise to an implicature of temporal ordering or causal relation between two events when it occurs unembedded will give rise to the same implicature when it occurs as a disjunct. Let's look again briefly at the data.[18] First, a conjunction case:

(16)   I'm not going to go to the party. It won't turn out well for me. Either I'll get drunk and no-one will talk to me, or no-one will talk to me and I'll get drunk.
(Modification of an example due to Wilson and Sperber 1998)

As Wilson and Sperber point out, the disjunctive sentence in (16) is not redundant, as it would be if the conjunctions in each disjunct were given a purely truth functional reading. Clearly, the actual reading we get is one which takes into consideration the temporal and causal implications of the ordering of the conjuncts in each of the disjuncts. And of course, these implications are just what we would get if the disjuncts occurred as independent sentences, as in:

(17)   a.   I'll get drunk and no-one will talk to me.
        b.   No-one will talk to me and I'll get drunk.

So, the most straightforward way to understand the interpretation is that the same principles which give rise to the temporal and causal implications in (17) also apply to the disjuncts in (16).
    Example (18) below illustrates the scalar implicature case:

(18)   Either the guests stole some of the teaspoons, or we didn't have many to begin with.

The speaker of this sentence clearly rules out the possibility that the guests stole all of the teaspoons. But how? The literature provides two different answers. Sauerland 2004 offers a refinement of the Gricean procedure for calculating scalar implicatures, on the basis of which he argues that (an utterance of) the sentence as a whole implicates (19):

(19)   The guests did not steal all of the teaspoons.

We'll look at Sauerland's proposal in more detail below. Others (including Chierchia 2004 and Levinson 2000) argue instead that the first disjunct receives the interpretation in (20):

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[18] I restrict myself to examples with clausal disjuncts. Non-clausal disjuncts can also generate scalar implicatures, as in:
(i) The guests stole some of the teaspoons or the bathroom towels.
Examples like these raise additional technical questions, which I don't want to become embroiled in here.

(20)   The guests stole some but not all of the teaspoons.

In what follows, we'll assume the position that is most difficult for the Gricean, that is, that the implicature is local to the disjunct.

As before, we begin by gathering evidence that the disjuncts in an unembedded disjunction have a sort of conceptual independence. First, we note that interlocutors clearly can respond to disjuncts independently of the disjunction as a whole, for example, by rejecting a particular alternative. This is nicely illustrated by Grice's notion (1989: 64) of "substitutive disagreement," illustrated by the following exchange:

(21)   A: Either Wilson or Heath will be the next Prime minister.
         B: I disagree, it will be either Wilson or Thorpe.

Here, speaker B disagrees with the first speaker's claim that Heath is even a possibility, and substitutes Thorpe. This is possible only if, in interpreting A's utterance, B is able to recognize that part of what is accomplished by it is to offer Heath as a possible winner. Similarly, speaker B could have said:

(22)   ... No, it won't be Heath

which again would not deny the disjunction, but only the reasonableness of one of the disjuncts. Or, again:

(23)   ...Yes, it really could be Wilson.

One could multiply examples, but it hardly seems necessary: it seems hard to deny that when a speaker utters a disjunction, we as interpreters retrieve the content of individual disjuncts, and can agree, disagree, question, or respond in any other way to that content independently of a response to the disjunction as a whole.

There is a very different kind of data which has been used to argue that even at the level of semantic analysis, the content of individual disjuncts is accessible. Eggert (2000) demonstrates, *contra* earlier claims, that the adverb *respectively* can be used with *or* coordinations in certain environments. Here are two of his examples (all of which are culled from web searches):

(24)   In most carbon compounds, an adjacent atom will contribute one to three electrons, which are matched by an equal number from carbon to form a single, double or triple bond, respectively.
(25)   Choose the snowflake or sun for winter or summer information, respectively.

These data are relevant because they show (although admittedly not for the clausal disjunct case) that the denotation of a disjunct must be independently retrievable in the course of interpretation.

I have made the same case with respect to disjunctions embedded under modals (Simons 2005a,b) as in, for example, (26).

(26)   Jane may sing or (she may) dance

I argue that the problematic free choice readings of sentences such as this, as well as other complications involving the interaction of *or* and modals, require a semantics for *or* which allows the denotations of the disjuncts to be "visible" throughout the process of composition.

My initial claim, though, was not merely that the content of disjuncts is retrievable by an interpreter, but that the disjuncts have a sort of conceptual independence, that they are recognized as having a particular discourse function. Grice himself offers the following view of the function of unembedded disjunctions:

> A standard (if not *the* standard) employment of *or* is in the specification of possibilities (one of which is supposed by the speaker to be realized, though he does not know which one), each of which is relevant in the same way to a given topic. "A or B" is characteristically employed to give a partial (or *pis aller*) answer to some [wh]-question to which each disjunct, if assertable, would give a fuller, more specific, more satisfactory answer.

In earlier work (Simons 2000), I argued that in fact an (unembedded) disjunction is felicitous only if it is so construable: that is, only if each disjunct is construable as an answer to a given question (either explicit or implicit), with each disjunct constituting a *distinct* answer to the given question.

This view provides us with a route to the application of the conversational maxims to individual disjuncts. If we take a very strong view of the "possible answer" requirement, we might suppose that each disjunct must be such that if its content were assertable, the disjunct could be felicitously uttered at that point in the conversation. (Obviously, a much more careful version of this view is needed to accommodate non-clausal disjuncts.) To be felicitously uttered, it would have to be consistent with the maxims, including orderliness and Quantity 1. If the interpreter assumes that the disjunct:

(27)   I'll get drunk and no-one will talk to me

could be felicitously uttered, she will further assume that the speaker intends to describe a situation in which the speaker first gets drunk and then, as a consequence, no one will talk to her. Similarly, on the presumption that the disjunct

(28)   The guests stole some of the teaspoons

if true would be felicitous if uttered, the interpreter can assume that the speaker's belief is that if (28) is true, then the stronger claim

(29)   The guests stole all of the teaspoons

would not be true. Hence, the interpreter can take the intended content of (28) to be "the guests stole some but not all of the teaspoons," even when it occurs as a disjunct.

Even if one takes a weaker view of the "possible answer" requirement, a case can still be made for local applicability of the maxims. Unembedded disjuncts are routinely taken as characterizations of states of affairs that the speaker considers possible. Cooperativity presumably requires that each disjunct should be the best characterization available. The maxim of manner then applies straightforwardly, just as in the case of the antecedents (or consequents) of conditionals. In the case of (27), extracted from (16) above, we have a description of a situation which contains two

eventualities. These eventualities can be temporally ordered and can plausibly stand in a causal relation. The interpreter can therefore assume that, following the orderliness requirement, the speaker has presented the eventualities in each disjunct in a way which reflects the envisioned temporal and causal relations between them.[19]

Now consider (28) as it occurs in (18) above. Here again, the interpreter first recognizes that the first disjunct constitutes a description of a state of affairs which the speaker considers possible (and a possible explanation for the shortage of teaspoons). She is entitled to assume that this description constitutes the best, or most accurate, or most specific characterization of this state of affairs. If the situation the speaker has in mind as a possibility is one in which the guests stole all of the teaspoons, then, given that there is a straightforward way to characterize this state of affairs without unduly complicating the utterance, she should have done so. Therefore, the interpreter can assume that the speaker does *not* have this state of affairs in mind, and is offering as a possibility that the guests stole some but not all of the teaspoons.

This understanding of the applicability of Quantity involves a rather liberal reading of the maxim. Quantity 1 as formulated by Grice enjoins speakers to provide "as much information as is required." Linguists have typically taken this to mean: "Make the strongest relevant assertion licensed by your beliefs," where entailment is taken to be the relevant notion of strength. Recanati (2003) is indeed skeptical of the idea that Quantity 1 can be applied directly to non-asserted utterance parts. He writes: "The scalar reasoning appeals to the idea that the speaker respects the maxim of quantity i.e. gives as much (relevant) information as possible; now it is far from obvious that the notion of 'giving information' can be divorced from that of asserting (or from similar notions)" (p.313).

But suppose we read Quantity 1 this way: Provide as much information as is required *about the situation you are describing*. Or, utilizing the notion of strength: Provide the strongest description of the situation you aim to describe compatible with the requirements of Relevance. The idea is this: a speaker's choice of words is always an indication of some belief she has about the situation she is describing. In the case where the utterance describes this situation as actual, the beliefs in question will be beliefs about what is the case. In the case where the utterance describes the situation as hypothetical, or as merely possible or probable, or as the content of someone's propositional attitude, the beliefs will be beliefs about what is possible or probable, or about another agents beliefs. Quantity 1, I suggest, enjoins the speaker to give the best — in many cases, strongest — characterization of the envisioned situation that is consistent with these beliefs. If the interpreter assumes that the speaker is abiding by this requirement, then she can apply Quantity 1 to the interpretation of non-asserted clauses.

This reinterpretation of Quantity requires the assumption that speakers begin with something in mind that they intend to talk about, some situation that they intend to characterize. I am uncertain whether or not this is controversial, but it does seem in keeping with Grice's understanding, where a speaker has a communicative intention which underlies her communicative acts.

5.1. A comparison with Sauerland 2004

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[19] Of course, in the case of (16), there is extra motivation for taking the description to include particular temporal and causal relations: if the description is not so taken, then the two disjuncts describe the same state of affairs, and the utterance would be infelicitous (for general Gricean reasons). So, the interpreter is compelled to interpret the disjuncts differently. As the only difference between the disjuncts is the order of the conjuncts, then that difference must provide the difference in intended content of the disjuncts.

We have already noted that Sauerland 2004 offers his own neo-Gricean response to the challenge posed by the generation of scalar implicatures from disjuncts and other embedded positions.[20] Sauerland's account has two parts. The first part is a revision of the Horn/Gazdar method for generating scalar alternatives. This revision begins with the definition of a *one step scalar alternative*, as follows:

(30)　A sentence ψ is a **one-step scalar alternative** of φ if the following two conditions hold:
　　　a.　$\varphi \neq \psi$
　　　b.　there are scalar expressions α and α' which both occur on the same scale C such that ψ is the result of replacing one occurrence of α in φ with α'.

Sauerland then uses this as the basis of a definition of a *scalar alternative* (simpliciter):

(31)　A sentence χ is a **scalar alternative** of a sentence φ if there is a sequence $(\varphi_0...\varphi_n)$ where $\varphi_0=\varphi$ and $\varphi_n=\chi$ and for all i such that $1 \leq i \leq n$, φ_i is a one-step scalar alternative of φ_{i-1}.

In other words, χ is a scalar alternative of φ if one can arrive at χ by replacing the scalar items in φ one by one with other elements from their scales.

　　The second part of Sauerland's analysis is the part of most relevance to this discussion. To account for the scalar implicatures generated by scalar items within disjuncts, he proposes a modification of the scale of which *or* is supposed to be a member. At least since Gazdar 1979, it has been presumed that *or* is an element of the scale <*or, and*>; this assumption has formed the basis of a standard account of the exclusive reading of *or* coordinations as a scalar implicature.[21]

　　On this standard view, the sole scalar alternative to a sentence *A or B* is the conjunction *A and B*. Sauerland proposes that the scalar alternatives should also include the disjuncts themselves.[22] Thus, sentence (33) counts as a one-step scalar alternative to sentence (32) (by replacement of a disjunction by a disjunct[23]), and sentence (34) as a one-step scalar alternative to (33) (by replacement of *some* by *all*).

(32)　Either the guests stole some of the teaspoons, or we didn't have many to begin with.

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[20] Additional neo-Gricean proposals are made by van Rooij and Schulz (2004 and forthcoming) and by Spector 2007. Both make use of the notion of exhaustivity to account for strengthened readings, and in turn explain exhaustivity in Gricean terms. See also Groenendijk and Stokhof 1984 for an early formulation of this idea.

[21] For a summary of this account and objections to it, see Simons 2000, section 2.5. and references therein.

[22] To make this work technically, Sauerland is forced to introduce two novel binary operators, $\boxed{l}$ and $\boxed{r}$, which constitute the lexical alternatives to *or* along with *and*. These operators, which do not correspond to any lexical items, are defined as follows:
(i)　For any two propositions A, B: $A\boxed{l}B=A$, $A\boxed{r}B=B$.
Sauerland himself describes this move as "more of a technical trick than a real solution."

[23] Technically, by replacement of *or* by $\boxed{l}$.

(33)   The guests stole some of the teaspoons.
(34)   The guests stole all of the teaspoons.

Thus, applying the definition of scalar alternatives, (34) is a scalar alternative of the disjunction (32), and the utterance of (32) is predicted to implicate that (as far as the speaker knows) it is not the case that the guests stole all of the teaspoons.[24]

This is undoubtedly an elegant solution. In particular, it allows for the apparently local implicature to be derived using a global mechanism. The calculation begins from the observation that the speaker has uttered *A or B*, and the implicature that the guests did not steal all of the teaspoons is generated as an implicature of the utterance as a whole, not of its subpart.

But this may also be a weakness of the account, for there are cases where the apparent local implicature could not plausibly be understood as an implicature of the utterance as a whole. Consider:

(35)   Bernice is in trouble again. Either she was supposed to visit each of the senators personally but she only CALLED some of them, or else it was okay for her to call them and she did in fact call all of them but she wasn't friendly enough. In any case, her performance is rated unsatisfactory.[25]

The first disjunct of the target sentence in (35) is naturally taken as meaning that Bernice called (and failed to visit) some but not all of the senators. On Sauerland's account, though, there are no local implicatures. Rather, if there is an implicature, it must be of the utterance as a whole. Presumably, it would be this:

(36)   It's not the case that Bernice called all of the senators.

But of course this cannot be an implicature of the utterance as a whole, because the second disjunct allows that Bernice did in fact call all of the senators. Sauerland's account would seem to predict that there should be no implicature at all, as the account does not allow for the generation of implicatures that are in conflict with the speaker's explicitly demonstrated knowledge or ignorance.[26] Yet the disjunction certainly is understood in a way consistent with a strengthened interpretation of the first disjunct.

Sauerland's account seems to share a fundamental intuition with mine: that to get the right implicature, one has to be able to "get at" the disjunct independently of the disjunction. But

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[24] Sauerland also makes explicit the steps that are required to derive a "strong" scalar implicature (of the form '$K_s(\neg p)$) from the weaker implicature licensed by Quantity of the form '$\neg K_s(p)$'.

[25] The point can perhaps be made with a simpler example, such as: "Either she called some of the senators or she called all of the senators." But in such examples, the quantifiers typically bear some kind of focus, and it has been suggested (King and Stanley 2006) that focus can be used to explain away some cases of apparent local implicatures. Hence, the more complex example.

[26] This is in fact a complicated example, as the first disjunct contains multiple quantifiers, a conjunction and a focus operator. So I am not entirely sure what implicature Sauerland would predict. But if in fact his account predicts a different implicature or no implicature at all, the problem remains: for the first disjunct does get the "some but not all" interpretation.

Sauerland does this via an algorithm for the generation of scalar alternatives. This leads to another concrete difference in the predictions of our accounts. First, I see the possibility of generating implicatures from disjuncts as part of a general phenomenon of applying conversational reasoning to embedded clauses (i.e. to non-asserted content). So, to the extent that my proposal is successful, it can be applied equally to implicatures generated by disjuncts and implicatures generated by the complements of propositional attitude verbs or the antecedents of conditionals. Second, my proposal offers a way to take disjuncts (and other embedded clauses) as input to any kind of conversational reasoning. So, parallel accounts can be given for local scalar implicatures and local implicatures of other kinds. Sauerland's proposal provides no basis for an extension to other cases of pragmatic intrusion.

6. Back to the antecedents of conditionals: Scalar Implicatures

The Walker example that we began with involved conjunction buttressing in the antecedent of a conditional. As Recanati points out, this case is fairly straightforward to deal with, as it involves the maxim of Manner, a maxim relating specifically to the form of expression used. But now what about scalar implicatures in the antecedents of conditionals?

The data in this case are more complex than in the case of disjuncts, for scalar items in the antecedents of conditionals sometimes give rise to (local) scalar implicatures, and sometimes don't. Compare:

(37)   If John owns two cars, the third one in the driveway must be someone else's.
          (Levinson 2000: 206)
(38)   If John has two cars, he can lend us one for the afternoon.

In example (37), *two* is interpreted as "exactly two"; so here, the antecedent seems to get the interpretation we expect if a scalar implicature is generated locally. Example (38), on the other hand, does not require this local strengthening; there is certainly no implication that if John has more than two cars, he will not be able to lend one.

Here are two attested examples illustrating the same variation:

(39)   For example, if there were two bases per codon, then only 16 amino acids could be coded for ($4^2=16$). [http://en.wikipedia.org/wiki/Genetic_code]
(40)   A Winter Weather Advisory will be issued if conditions warranting two separate winter advisories are met. [http://weather.cod.edu/charts.html]

The difference between the interpretations in each pair has a common-sense explanation, the sort that would be obvious to anyone unencumbered by theory. The sentence in (37) of course only makes sense on the assumption that by *two* the speaker meant "exactly two." Wanting to attribute to the speaker an intention to make a sensible claim, the interpreter so understands her. In (38), on the other hand, no such constraint is in place. Indeed, one assumes that the consequent will hold just as well if in fact John has more than two cars. Given our standard assumptions about the circumstances under which someone can lend a car, the "two or more" interpretation makes the most sense. Hence, that is what we take the speaker to have meant.

Can the theory-encumbered adopt this sensible account? It depends. The principal stumbling block is that the implication, when present, indeed is *local* – that is, it contributes to the interpretation of the antecedent, just as in the case of conjunction buttressing. Yet the common-sense

account appeals to the question of whether or not the conditional as a whole makes sense – that is, to utterance level considerations.

The common-sense account remains compelling nonetheless, and different theorists find different ways to accommodate it. For advocates of the Levinsonian default interpretation view, cases like (37) and (39) show the default interpretation of the number word. Cases like (38) and (40) where the default is suspended show the context-sensitivity of the default: where the default is in conflict with other considerations, it can be over-ridden.

It is not, though, completely clear that the global "sensibleness" considerations adduced above would really suffice to override the default. Suppose a speaker had uttered (41) rather than (38) :

(41)   If John has exactly two cars, he can lend us one for the afternoon.

This is not obviously false or even infelicitous. It might lead the hearer to ask "why *exactly* two"; and the speaker might have an answer. (Perhaps the speaker thinks that anyone with more than two cars would be such a car fanatic that they would never lend one.) Similarly, in the case of (40), it might be that there is distinct kind of warning issued in cases where more than two separate advisories are met. In other words, if we assume that the strengthened interpretation is the default, it is not clear that we have here considerations which are strong enough to over-ride it.

Chierchia 2004 also adopts a version of the common-sense account. His account predicts that scalar implicatures will in fact *fail* to arise in the antecedents of conditionals.[27] So for him, the problematic cases are those where the strong readings appear nonetheless. He suggests that these interpretations involve a non-local process of accommodation, driven by the sort of "sensibleness" considerations adduced above.[28] For example, he proposes that in interpreting (37), in order to understand it in a way that makes sense, we "restrict our consideration to sets of worlds from which people with more than two cars are excluded" (67). This restriction applies at the sentence level, and does not involve any change in the interpretation of the antecedent itself. Hence, it involves no pragmatic intrusion. As Chierchia notes:

> The effect of this accommodation is the same as the computation of an implicature. But if we are right, the mechanism through which this happens is very different from how implicatures come about normally [in Chierchia's system – ms.]. In [(37)], the implicature is not added locally. (67).

I am inclined to simply accept the common-sense explanation at face value. We assume, as above, that the interpreter of a conditional recognizes the antecedent of the conditional as a linguistic unit with a specific function within the discourse. She seeks to assign to it an interpretation which maximizes the cooperativity of the speaker. But interpretation is not necessarily linear. We need not assume that the interpreter assigns an interpretation to the antecedent entirely independently of the attempt to make sense of the utterance as a whole. Rather, it seems plausible that the interpreter assigns to the antecedent an interpretation which improves the overall sensibleness of the utterance. So, the antecedents of (37) and (39) get a strengthened interpretation; those of (38) and (40) do not.

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[27] This is because these are (roughly) downward entailing environments. His account is tailored to eliminate standard scalar implicatures in these environments.

[28] Chierchia does not say *what* he thinks is being accommodated: presumably, some sort of speaker presupposition.

Let's consider how the interpretation might proceed. We begin with (37), assuming our new understanding of Quantity 1. The interpreter reasons that the speaker intends her to consider a situation in which John owns two cars. She reasons that the speaker does not (in particular) intend her to consider a situation in which John owns more than two; if she did, she should have offered a different characterization of the hypothetical situation. She can indeed make sense of the utterance as a whole if she restricts her attention, in considering the antecedent, to situations in which John has exactly two cars: so, such are the situations she considers.

In (38), the antecedent is the same. So, as before, the interpreter reasons that she is to consider situations in which John owns two cars rather than three or more. She can make sense of the utterance given this understanding; but her world knowledge tells her further that if the conditional is true under the stronger interpretation of its antecedent, it is (probably) also true under the weaker interpretation of its antecedent. So in this case, the interpreter does not have a strong reason, as she does in the case of (37), to believe that the speaker intends her to consider only hypothetical situations in which John has two cars and no more.[29]

In these cases, I am allowing for interaction between local pragmatic considerations (application of Quantity 1 to the antecedent of the conditional) and global ones (finding a plausible reading of the conditional as a whole). However, I am suggesting that where strengthening takes place, it is indeed a local effect. This observation points to a distinction that should be made between two different notions of locality. In saying that an implicature is local, we may mean that the implicature is *computed* locally: that is, that the implicature (or other pragmatic effect) is the result of a process which takes into account only some sub-part of the entire utterance. My proposal as to how strengthened interpretations of disjuncts arise is an example of local computation. Levinson's Default Interpretation view and Chierchia's grammatical view are also proposals that allow for local calculation of scalar inferences.

But there is a second thing we can mean when we say that an implicature is local: namely, that it shows its effects at a level below that of the maximal sentence. This is how we defined pragmatic intrusion at the start of the paper.

Perhaps the most typical view is that local effects must be the result of local computation. Both Chierchia's and Levinson's systems accomplish this, although both systems also allow for global considerations to over-ride the generation of local effects. Sauerland, on the other hand, aiming to provide a Gricean account of apparent embedded implicatures, argues for a view on which the implicatures are computed globally (i.e. with the total utterance as input) and on which the resulting implicatures are also global (i.e. the disjuncts themselves do not receive modified interpretations).

In Relevance Theory and various realizations of the Truth Conditional Pragmatics program, computations and effects are not assumed to go hand in hand. In particular, it is common in these accounts to argue that global pragmatic considerations give rise to local effects, including the assignment of specific interpretations to lexical items.

We must also allow that in principle it might be possible for inferences that are locally computed – that is, generated from an embedded linguistic expression – to have a global effect. I would suggest

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[29] The story about examples like (38) could be quite different. Perhaps the *two* in the antecedent *is* interpreted as "exactly two." But given the background assumptions that warrant the assertion, anyone who accepts (38) on this interpretation would also accept any utterance of the form:

(i) If John has n cars, then he can lend us one for the afternoon,

for n greater than 2. Thus, the intuition that there is no upper bound in the antecedent of (38) might be simply the intuition that as soon as one accepts (38), one also accepts a whole series of conditionals with stronger antecedents.

tentatively that this is happening in examples like (38). While in this case the local effects of Quantity 1 seem to be undermined by the fact that the overall reasonableness of the utterance does not require them, the maxim seems not entirely without force. All other things being equal, the speaker at least weakly implies that *she* thinks that John has at most two cars.[30] Here is another example with a similar effect, extracted from a set of instructions to bidders for university contracts:

(42)   If Bidder submits three originals of the signed Agreement and all other items required to be submitted to University within10 days ... University will award the Contract to Bidder by signing the Agreement and returning a signed copy of the Agreement to Bidder. [http://www.ucop.edu/facil/fmc/facilman/volume4/part2/long/ib.pdf]

The antecedent, surely, does not have an *exactly* interpretation: if the bidder were to accidentally submit four originals, would they be denied the contract? Yet there is surely an implication that the bidder should submit exactly three. There are no doubt multiple possible explanations for this effect. One of these possibilities is that we see here a global effect of a locally computed implicature.

Let me then summarize briefly the conclusions from this discussion of scalar implicatures in the antecedents of conditionals. We see that scalar items in this position sometimes do and sometimes do not lead to strengthened interpretations of the antecedent. The most natural explanation for this variability is based on global considerations: an interpreter chooses a strengthened interpretation if this is required to make sense of the conditional as a whole. To accept this sort of explanation, however, we must accept that global considerations can have local effects.

7.   Embedding under propositional attitudes
By now the general strategy will be clear, so I will deal more briefly with this third case. The sort of examples we are now concerned with are repeated in (43) and (44) below:

(43)   Bill believes that Sally sold her apartment and left town.
(44)   Bill believes that some of his students are waiting for him.

The application of Manner to the embedded clause in (43) is fairly unproblematic. Let's consider the more difficult issue of applying Quantity, reinterpreted as above, to (44).

The basic idea is as follows: the speaker, in uttering (44), has a particular situation in mind which she intends to describe Bill as believing. She uses the words "some of his students are waiting for him" to describe that situation. If the situation she had in mind were one in which many, or most, or all of Bill's students were waiting for him, she could have used a different formulation – embedded a different proposition – in order to provide a more accurate representation of that situation. As she didn't do so, she must intend to convey that the situation Bill believes to hold is one in which some but not more than some of his students are waiting for him.

First question: how is this different from the standard Gricean account? The standard account says that the speaker should make the strongest assertion compatible with her beliefs and with relevance. An utterance of:

(45)   Bill believes that many of his students are waiting for him

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[30] One way in which things might not be equal is if some factor of the conversational situation makes clear that the speaker does not have an opinion as to how many cars John has.

would have been a stronger assertion (as (45) entails (44)). So, doesn't the account above boil down to the same thing as the standard account? If the speaker were in a position to make a stronger assertion, she should have done so.

The accounts are obviously closely related, but they differ in their predictions. The standard account, in its usual implementation, allows for the generation of an implicature which consists of the negation of (45). As noted above, this implicature does not produce a strengthening of the content of the embedded clause. My account, which focuses on the embedded clause as a characterization of a particular state of affairs, does exactly this.

But there are two problems: possible ignorance of the speaker; and possible ignorance of the subject.

It is standardly recognized that in cases where the speaker is understood to be under-informed about the situation at hand, no scalar implicature is generated by the use of a scalar item. Consider, for example, the following:

(46)   We have begun to review the evidence and have already determined that some of the results were fraudulent.

Here, the first clause makes clear that the speaker has incomplete information about the situation. In this case, the *some* in the embedded clause is not interpreted as *some but not all*. Rather, what is understood is that the evidence so far has shown that some results are fraudulent; it is possible that further evidence will show that more than some are.

Now, suppose the speaker of (45) were known to have only partial information about Bill's beliefs, as is suggested, for example, in the following context:

(47)   Bill said he had to go to his office hours. Apparently he believes that some of his students are waiting for him.

It is not entirely clear to me what, if anything, is locally implicated in this case. Perhaps the speaker still attributes to Bill the belief that some but not more than some of his students are waiting for him. If so, the reason is as before: if the speaker intended to attribute to Bill a stronger belief, there are linguistic resources for her to do so easily. However, unlike the case where the speaker is taken to be well informed, we, as hearers, may be unwilling to give full credence to the strong belief claim. We might decide that the speaker's evidence (that Bill said he had to go to his office hours) suffices for the weak claim, but not for the stronger one.

On the other hand, perhaps the speaker is simply taken as attributing to Bill the belief that at least some of his students are waiting, and possibly more. This would be natural if we take the weakness of the speaker's evidence as indicating that she does not have in mind a fully specified state of affairs, belief in which she intends to attribute to Bill. Alternatively, perhaps we recognize that while the speaker's evidence suffices for her to make the weak belief claim, her evidence does not suffice for her to make the strong belief claim. Assuming the speaker to be acting in accord with the requirements of Quality, which supercede those of Quantity, we attribute the weaker claim to the speaker.

And perhaps this is a case where the speaker neither implicates nor is explicitly recognized as not implicating. Remember that conversational implicatures arise only where they are required to make sense of the speaker's utterance, to render it fully in conformity with the requirements of cooperativity. Sometimes, it simply doesn't matter whether the speaker had in mind something more or less specific. This may be one of those cases.

Russell 2006 offers an explanation of cases like (44) within the standard Horn/Gazdar framework for scalar implicatures. Let us make the standard assumption that an utterance of (44) implicates the negation of the stronger scalar alternatives. So, one of its implicatures will be:

(48)   It is not the case that Bill believes that all of his students are waiting for him.

Chierchia 2004 argues that this implicature is too weak, as it could be true if Bill had no belief at all about whether his students were waiting for him. Russell points out, though, that if Bill does have a belief about whether all his students are waiting for him then, if (48) is true, it must be the case that Bill believes that it is *not* the case that all of his students are waiting for him. Russell argues that the apparent strengthening of the belief clause is not itself an implicature, but is an inference generated from the actual implicature (48) plus the assumption that Bill has a belief about the relevant proposition. In the case in question, where it is asserted that Bill has a belief about some of his students waiting for him, it is not implausible that we assume that he also has beliefs about whether many, most or all of his students are waiting for him.[31]

Russell further supports his account with the observation that if the subject is known to lack an opinion about the stronger proposition, no implicature (or pseudo-implicature) is generated. His example:

(49)   George has not yet formed an opinion about all of his advisors, but, at this point, he believes some of them are crooks.

The observation seems correct: there is no implication here that George believes that not all of his advisors are crooks. However, the explanation seems incomplete. Note first that the following is perfectly coherent:

(50)   George has not yet formed an opinion about all of his advisors, but at this point, he believes most of them are crooks.

So, knowing that George lacks an opinion about *all* of his advisors does not rule out the possibility that he has an opinion about *most* of his advisors. This being so, Russell's story doesn't explain why (49) lacks the implicature that George believes it is not the case that most of his advisors are crooks.

The solution here may be that the implicatures in question are not as finely differentiated as the standard story suggests. As interpreters, we take the subject to be either well informed or not well informed. In the latter case, we do not look for a strengthened reading. The same kind of explanation can be extended to my account.

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[31] Russell discusses the specific example in (i):
(i) George believes some of his advisors are crooks.
He says "Speakers I've consulted readily agree that 'Either George thinks all his advisors are crooks or he thinks they're not all crooks' has to be true, suggesting that this is a 'default' background assumption." I'm not sure what kind of default assumption Russell has in mind. Certainly, it seems implausible to assume that for every proposition p and every agent a, either a believes p or a believes not-p; that assumption would eliminate agnosticism. However, it may well be plausible that in a situation where it is known that a believes some proposition p, and q is a scalar alternative to p, that a is typically assumed to have a belief about q.

It may be possible to adjudicate between my view and Russell's if it can be established with certainty whether or not the observed implication is part of the content of the asserted belief claim. However, it should also be noted that my view and Russell's are not incompatible. I am not claiming that implicatures cannot be calculated on the basis of the total asserted content, only that in some cases they may – perhaps in addition – be calculated on the basis of the form and content of an embedded clause. In some cases, multiple lines of conversational reasoning will converge on the same conclusion.

8. Local relevance implicatures

The cases of intrusive implicature which we have discussed to this point are instances of *generalized implicatures*, cases where the use of a particular form typically gives rise to a given implicature. It is on cases such as these that the recent literature dealing with intrusive implicatures has focused. A good deal of this recent debate has been around the question of whether these generalized implicatures are indeed implicatures at all in Grice's sense, or are rather some kind of conventional but defeasible content of particular expressions. If all of the relevant cases can be accounted for as cases of conventional content, then there is no need to find a way to account for local generation of conversational implicatures.

To bolster the case that such an account is needed, I turn to Relevance implicatures. Such implicatures are uncontroversially non-conventional and also non-generalized; contextual considerations must always play a role in their generation. As far as I am aware, no one has yet argued for the existence of local Gricean implicatures on the basis of local Relevance implicatures.[32] I believe that examples such as the following make the case:

(51)　A: How will you get to the party?
　　　B: Either I'll borrow a car or I'll take the bus and walk from the bus station.
　　　B_1: If I can't borrow a car, I'll take the bus and walk from the bus station..

Consider the disjunctive response B. The first disjunct is incomplete as an answer to the question. To understand it as an answer, the interpreter must assume that the speaker will use the car she borrows to drive to the party. This is one of those almost undetectable cases of implicature – the inference is so immediate and obvious it is hard to see – but it is a Relevance implicature nonetheless, on a par with Grice's garage example, where speaker B implicates (via Relevance) that the garage is open:

(52)　A: I am out of petrol.
　　　B: There's a garage round the corner.

Now, we should contrast (51)B with (53) below:

(53)　A: Did they have a picnic?
　　　B: Either it rained or it was cold.

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[32] To be clear: many people have argued that there are nonce inferences which become part of sentence content. See in particular, again, the work of the Relevance Theorists (Sperber and Wilson 1986, Carston 1988, 2002). Kent Bach (Bach 1994) and Francois Recanati (especially Recanati 2004). As far as I know, though, no-one has used such cases to advocate for a modified Gricean view.

B's utterance here clearly implicates that there was no picnic. But this implicature can be understood as an implicature of the utterance as a whole. Either of the circumstances mentioned would (presumably) rule out a picnic; so, the interpreter can reason that, if the disjunction is true, there was no picnic.

But (51)B above is different. Here the implicature is generated by the first disjunct alone, and is required to establish its relevance. The implicature is not needed to establish the relevance of the utterance as a whole, except insofar as the relevance of the whole requires the independent relevance of each disjunct. The conditional (51)B$_1$ demonstrates the same point. Here, the implicature must be internal to the antecedent of the conditional.

Here is another example which illustrates the same point:

(54)   [Context: scrabbling sounds are heard coming from overhead]
        A: What's making all that noise?
        B: Either there's a nest in the eaves or a family of squirrels has moved in there.

The first disjunct of B's reply can be relevant only if she is taken to implicate that the nest, if there, is in use: an abandoned nest would not make any noise.

9. Conclusion

I have argued here for a reconceptualization of conversational implicatures. Grice saw implicatures as arising primarily as a consequence of observations about what the speaker has said. The exception, for him, were Manner implicatures, which are generated by observations about *how* the speaker said what she said.

I have suggested that we should instead see conversational implicatures as inferences generated by observations about what a speaker has (merely) expressed: this includes observations about sentence parts whose content is not part of what is asserted. The justification for this shift in view comes from the recognition that interpreters can, and do, identify the content, form and discourse function of non-asserted sentence parts and can reason about why the speaker has chosen just that content or just that form to carry out the particular discourse function.

The maxims as formulated by Grice are not clearly inapplicable to non-asserted content. However, reformulations may be helpful in understanding how they can be so applied. I have offered a reformulation of the first part of the Maxim of Quantity, as follows:

Quantity 1: Provide as much information about the situation you are describing as is required by current conversational purposes.

In some cases (not considered here), implicatures generated by observations about non-asserted clauses may have "global" effects, that is, be understood as commitments of the speaker.[33] The cases examined here, however, involve locally generated implicatures which also have local effects. That is, they become part of the understood content of an embedded clause, falling under the scope of operators. This claim stands in conflict with Grice's view that "what is said" can be identified without recourse to conversational reasoning. It also stands in conflict with a compositional

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[33] I have suggested elsewhere that this may be the correct account of presupposition projection in those cases where the presuppositions are best understood as arising from conversational inference.

semantics in which only conventionally encoded content is "visible" to sentential connectives and other embedding expressions.

But perhaps this conclusion departs less from current semantic theory than one might expect. Semanticists have for some time countenanced different types of semantic content which can have truth conditional effects. For example, semanticists (following Rooth 1985) allow that expressions can have, in addition to their ordinary semantic value, also a "focus semantic value," which depends upon the placement of focus in the expression. Some sentences (for example, those containing focus sensitive adverbs such as *too* and *even*) have truth values which are determined by both the ordinary semantic values and the focus semantic values of their parts. In the recent influential work by Chierchia alluded to several times in this paper, sentence parts are assigned both an ordinary semantic value and a "strengthened" or "scalar" semantic value. Sometimes one and sometimes the other is relevant for determining the semantic content of the whole.

One might object that moves of this sort are quite different from a move allowing particularized conversational inferences to contribute to truth conditional content. But focus semantic values and scalar values are not themselves clearly context independent. For example, although the focus semantic value of an expression is algorithmically determined given a set of alternatives, the identification of the set of alternatives is a contextual matter.

There is, though, no doubt that the job of the formal semanticist becomes even harder once conversational contributions to "what is said" are acknowledged. For the job becomes one of providing precise formulations of the semantic contributions of linguistic operators which operate on multiple levels of content simultaneously. This is undoubtedly complicated. But as Austin says at the conclusion of 'Performative Utterances':

Well, it is complicated a bit; but life and truth and things do tend to be complicated.

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