D-1 Contrast, Quantifier Scope and Embedded Implicature

Satoshi Tomioka

1 Embedded Implicature

The aim of this paper is to evaluate the proposal to deal with embedded scalar implicatures by Geurts (2010), who is one of the most vocal advocates for the traditional 'Globalist' approach to scalar implicatures. The issue of local/embedded scalar implicatures has been a polarizing topic in recent years. Under the traditional view that was originally conceived by Grice, the generation of a conversational implicature is a post-semantic process, and it has been the most widely accepted view. There is now a competitor to the globalist approach: the localist/grammaticist thoery, represented by Chierchia (2004, 2006), Fox (2007), Fox (2009) and Chierchia *et al.* (2012), and central to the debate between the two approaches are embedded/local implicature phenomena. The promotors of the localism argue that scalar implicatures are generated grammatically via the presence of a implicature-inducing operator. It is a radical departure from the traditional understanding of what implicatures are, and it is not surprising that the localist/grammaticist doctrine is not universally embraced.

The presence of some phenomena relevant to embedded implicatures was noted fairly early on (e.g., the well known *Hurford's Constraint* in Hurford (1974)), but their theoretical importance has increased dramatically as they began to be examined much more rigorously and systematically (cf. Chierchia (2004), van Rooij and Schulz (2004), Sauerland (2004) among others). The following are a couple of examples of embedded implicatures.

(1) a. Andy believes that some of his colleagues are crooks. $\rightsquigarrow$ Andy believes that not all of his colleagues are crooks.
b. Every student solved some of the problems. $\rightsquigarrow$ Every student solved some but not all problems.

The implicatures in (1) are stronger than what the Globalist approach predicts. (1a) should implicate that Andy has no firm beliefs concerning whether all of his colleagues are crooks, while the implicature in (1b) should be that not every student solved all of the problems. The Chierchia/Fox/Chierchia-et-al theory proposes that there is a sentential operator *Exh* (the term used in Fox 2007), which operates on the set of scalar alternatives of its prejacent and negates the non-weaker alternatives that are compatible with the prejacent. (2) illustrates the steps, using the sentence (1b). Here I take the liberty to simplify the proposals found in the papers listed above, as the exact technical execution of the idea is not crucial for our purpose.

(2) Every student solved some of the problems.
a. LF: [[Every student]$_1$ *Exh* [t_1 solved some of the problems]
b. Set of Alternatives under *g*: {g(1) solved none of the problems, g(1) solved some of the problems, g(1) solved all of the problems}
c. With *Exh*: not true that g(1) solved all of the problems
d. The end result: Every student solved some but not all problems.

2 Globalists Battle Back

There have been a variety of counter-proposals from the Globalist camp (e.g., Russell 2006, Geurts 2009, 2010, Geurts and Pouscoulous 2009), but I would like to focus on the analysis proposed in

Geurts (2010, Chapter 8). Geurts maintains that the majority of embedded can be accommodated within the Globalist framework: '... they can be accounted for in a principled way as Q-implicatures, or at any rate, as essentially involving Q-implicatures. True, we had to assume that additional factors were involved in each case, but such auxiliary assumptions as had to be made could always be motivated on independent grounds.' (Geurts 2010, p.181). At the same time, he acknowledges that there are some fairly clear cases of what appear to be embedded implicatures when the relevant scale-inducing items are contrastively focused. For instance, focus seems necessary to generate the Horn-scale implicatures in the following examples.

(3) a. Around here, we don't LIKE coffee, we LOVE it. Geurts (2010, p. 181, (36a))
b. I'd rather have a WARM bath than a HOT one. Geurts (2010, p. 181, (36b))

Geurts argues that contrastive focus is not merely an auxiliary factor but an essential ingredient for 'embedded' implicatures.

(4) a. For 'an embedded implicature' to arise (consistently), the relevant scalar item must be contrastively focused.
b. A contrastively focused scalar item undergoes *semantic narrowing*, which makes its meaning stronger than its original meaning.
c. Thus, the strengthening with focus is a semantic phenomenon. It is not an implicature (hence, the quotation marks around embedded implicatures)

Typically, loving something entails liking something (but not vice versa). Contrasting 'like' with 'love', however, the meaning of the former undergoes semantic narrowing – it narrows down to 'like but not love'. Going back to one of the previous examples, it is indeed true that focusing helps the embedded implicature become prominent (although my informants are unsure if focus is absolutely necessary).

(5) Every student solved SOME of the problems.

In this example, there is no overt 'antecedent' with which *some* contrasts, but with heavy stress on it, it is fairly clear that the speaker intends to contrast it with another quantifier, most likely with *every* or *all*. Then, the focused quantifier is assumed to acquire the strengthened meaning; *some but not all*.

3 Intermediate Scope and Intermediate Implicature

Let us now examine what is predicted by Geurts' proposal. Since the relevant 'embedded implicatures' are tied to the semantically narrowed lexical meanings of focused scalar items, the scope of implicatures are tied to the scope taking possibilities of the scalar items (although the matrix implicatures are predicted to be available all the time, regardless of the scope of the scalar item). In this regard, we will examine of the status of intermediate implicatures, following **?**. When a scalar item is doubly embedded, there are potentially three different implicatures depending on where the computing of implicatures takes place, and we will look at the following two cases that involve focused scalar quantifiers.

(6) a. When a focused scalar quantifier is embedded within a finite clause (a scope island), the intermediate implicature is not expected to emerge.
b. When a focused scalar quantifier is embedded within an infinitival clause, the intermediate implicature is expected to available, but the scope of the scalar item itself has to take the intermediate scope.

Let us first consider the following example, where a focused *some* is embedded in a finite clause.

(7) In City A, every school requires that the students read SOME of the *Harry Potter* books. In City B, on the other hand, every school requires that the students read ALL of them.

The first sentence potentially generates three implicatures.

(8) a. Global: Not every school requires that the students are required to read all the textbooks.
b. Intermediate: Every school allows the students to read all the *Harry Potter* books (i.e., the students who read all of them should not be penalized).
c. Local: Every school requires the students not to read all the *Harry Potter* books (i.e., reading of all of them is not a good thing to do).

It is not clear, as far as my consultants' judgments are concerned, whether all the three readings are equally available, but importantly, the intermediate reading seems to be the most easily detected. The situation becomes rather different if the presumed semantic meaning of the focused *SOME* is explicitly stated:

(9) Every school requires that the students read some but not all of the *Harry Potter* books.

In these sentences, the most salient reading (and the only available reading for many) is the local interpretation: The students should not be allowed to read all of the *Harry Potter* books. The difference between (8) and (9) is not expected under Geurts' semantic narrowing account. With all things being equal, the two quantifiers, the focused *some* and the fully spelled out versions *some but not all, only some*, should behave the same.

There may be an objection to this characterization, however, based on the following assumption. An indefinite NP, including a quantifier phrase with *some*, is known to take exceptionally wide scope, possibly due to the availability of the choice function strategy (Reinhart (1997), Matthewson (2001) among others). The sentence below, for instance, can mean that there are some philosophers such that if we invite them, Anna will be upset.

(10) If we invite some (of the) philosophers, Anna will be upset.

Can a focused *some* also have this scope privilege that are not available to truly quantificational NPs? This is rather unlikely because of the example in (9), in which the overtly strengthened *some but not all* does not produce the same effect. Indeed, *some but not all* cannot take exceptionally wide scope, and in this regard, it aligns with other truly quantificational expressions. Consider (**??**).

(11) a. If we invite some (of the) philosophers, Anna will be upset, but I don't know which ones.
b. If we invite some but not all of the philosophers, Anna will be upset, but #I don't know which ones.

According to the analysis of sluicing in Chung *et al.* (1995), the legitimacy of sluicing in (11a) is the indication that the quantifier *some (of the) philosophers* can take the matrix scope. On the other hand, the failure of sluicing in (11a) should be taken as the evidence that *some but not all* cannot take scope beyond the *it*-clause. It is not feasible, therefore, to attribute the availability of intermediate scope to the exceptionally wide scope taking of an indefinite. Moreover, the same implicature/scope patter is observed with *most*, a quantifier that does not have the choice function strategy as an option but still generates the relevant implicature.

(12) In City A, every school requires that the students read MOST of the *Harry Potter* books. In City B, on the other hand, every school requires that the students read ALL of them.

The contrast between *most* and *all* may not sound as natural as the one between *some* and *all*, but the basic result is the same. The intermediate implicature is available and seems to be the most salient reading of the three. The explicitly spelled version of this focused *most*, shown below, does not have the relevant intermediate reading.

(13) Every school requires that the students read most but not all of the *Harry Potter* books.

The data examined above show that (i) a focused scalar quantifier can induce not only the most local implicature but also the intermediate implicature, but that (ii) the explicitly strengthened version of the same quantifier does not generate the intermediate reading unless the intermediate scope is independently available for the quantifier, and that (iii) a strategy for exceptional high scope, such as the choice function strategy, is not responsible for the presence of an intermediate implicature.

Unlike finite clauses, infinitival clauses do not block QR. Therefore, the sentence in (14) is three-way ambiguous based on the scope of the quantifier *some*.

(14) Every school requires their students to read some of the *Harry Potter* books.

(15) a. Matrix: Some of the *Harry Potter* books (let's say the first three) are such that every school requires their students to read them.
b. Intermediate: For every school, there are (potentially different) *Harry Potter* books such that that that school requires their students to read them.
c. Local: Every school requires that their students to read some *Harry Potter* books or others (it does not matter which).

Here is the prediction. Unlike with a finite clause, the intermediate implicature is available when a focused scalar quantifier is embedded within an infinitival clause. With the intermediate implicature, the quantifier is also expected to have the intermediate scope. Let us now examine the relevant case.

(16) In City A, every school requires their students to read SOME of the *Harry Potter* books. In City B, on the other hand, every school requires their students to read ALL of them.

The most salient implicature of this sentence is the intermediate one: Every school is such that it does not require the students to read all the *Harry Potter* books, and reading all of them is allowed. However, the most embedded scope of *some* is possible and indeed the most easily available of the three possible interpretation: Every school requires their students to read some *Harry Potter* books or others, and it does not matter which ones. This mismatch between the implicature and the quantifier scope is not what Guerts' theory predicts.

4 Conclusion

One of the main objections to the Localist/Grammaticist approach to scalar implicatures is that it over-generates. The criticism of the Globalist approach is the opposite: It under-generates. In this paper, we used as the premise the least permissive generalization about embedded implicatures: Embedded implicatures are possible only if the relevant scalar items are (contrastively) focused. This generalization allows one to have the globalist approach that employs a special strategy for a focused scalar item. Geurt's proposal is along this line, and his special strategy is lexical. Focused scalar items undergo semantic narrowing and generate what appear to be implicatures. The data examined in this paper suggest, however, that this global-plus-lexical approach does not meet the challenge of intermediate implicatures. Intermediate implicatures are available when focused scalar items do not take the corresponding scope.

The conclusion here does not necessarily mean the doom of the globalist approach. It shows that the special strategy for focused scalar items cannot be lexical. What could work is a sentential operator that works on the set of focus alternatives in such a way that it negates all the non-weak alternatives. Iit is practically identical to the kind of exhaustivity operator that the localist theorists have proposed. If one wishes to maintain the globalist doctrine, therefore, one still needs to partially adopt the localists' strategy to derive embedded implicatures of focused scalar items.

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