In: Emar Maier, Corien Bary & Janneke Huitink, eds. (2005) "Proceedings of SuB9"
www.ru.nl/ncs/sub9

SOME SCALAR IMPLICATIONS REALLY AREN'T QUANTITY IMPLICATURES - BUT 'SOME''S ARE

Richard Breheny
University College London
richardb@ling.ucl.ac.uk

Abstract

In this paper, I argue that 'two' means 'exactly two' and in cases where there is an 'at least two' interpretation, this is due to pragmatic presupposition (often about speaker's grounds). By contrast, I argue that 'some' means 'a quantity (of)'. Where there is an 'and not all' interpretation this is due to pragmatic inference/implicature (about speaker's grounds) based on some kind of Gricean Quantity maxim/principle - even in cases where the implicature is embedded.

1 Numerals

1.1 The Unilateral View

Consider a normal implication of (1a) given in (1b):

(1) a. Two of Mary's students did well on the test
b No more than two of Mary's students did well on the test

This probably would be a scalar conversational implicature if 'two' has a 'unilateral meaning'. For instance if its lexical meaning could be characterised as follows:

(2) two Fs G $\leftrightarrow |\cup\{X: F(X) \wedge G(X)\}| \geq 2$

There have been many proposals that this implication is an implicature which would be premised on some Quantity maxim. (Gazdar 1979, Levinson 1981, van Rooy & Shulz 2004). Although these accounts differ, they are at paints to ensure that the implicature does not normally arise in downward entailing (DE) contexts. For example, that the implication in (1b) does not fall within the scope of the conditional in (3):

(3) If two of Mary's students did well on the test, then Mary won't be fired

This is reasonable when we look at other triggers for scalar implications. For instance, (4a) might often imply no one other than John did well on the test. This exhaustive implication does not attach to the antecedent of the conditional in (5a). Mutatis mutandis, (4b) tends to imply that not both John and Bill did well while this implication disappears from the antecedent in (5b):

(4) a. John did well on the test
    b. John or Bill did well on the test
(5) a. If John did well on the test, then Mary won't be fired
    b. If John or Bill did well on the test, then Mary won't be fired

Intuitively, this makes sense from a Gricean perspective since implicatures based on the Quantity maxims turn on there being a more informative alternative content of what the speaker *says*. In the case of 'A or B' this alternative is 'A and B'. Where there is embedding in a conditional, the alternative, 'if A and B then P' is no longer more informative and so there is no ground for this kind of implicature. We can characterise a unilateral view as follows:

Unilateral View: 'two' has unilateral lexical meaning (as suggested in (2)) and common scalar implications arise as Quantity-based conversational implicatures.

1.2 Problems for the Unilateral View

A great many observations have been made which suggest that numerals are different to other scalar items. It seems that numerals don't behave like they have unilateral interpretations (Carston 1988, 1998, Horn 1992, Geurts 1998, i.a.). Here I will add some observations of my own (in **I** and **III**) in a survey of some of arguments.

I Downward Entailing Contexts: Consider the examples in (6):

(6) a. Everyone who has two children receives tax benefits
    {Implies that the same goes for people with 3 kids, 4 kids etc}
    b. Everyone who has two children received tax benefits
    {? Sort of implies that the same goes for people with 3 kids, 4 kids etc}
    c. No one who has two children received tax benefits
    {No implication about 3, 4 etc kids}
    d. No one who has two children receives tax benefits
    {May imply that people with 3, 4 etc kids receive benefit}

If the unilateral view is right, these should all have implications along the lines of (6a). But they do not. In particular, (6d) seems to imply that people with more than two children *receive* benefits. Even the suggested implication of (6a) seems to turn on a presupposed 'covering law' concerning how tax benefit rules are devised. Consider (7) by contrast where no such covering law would be presupposed:

(7) Everyone who has two children is happy

It seems that on its most accessible reading, what (7) says would be true if John is miserable but has five children. Note that, by contrast with (7), (8) seems to quantify over people who have children and pets - as we would expect with the normal (unilateral) inclusive meaning of disjunction:

(8) Everyone who has children or pets is happy.

Indeed, it is easy to show how numerals should behave if the unilateral view is right by considering disjunction in contexts similar to those in (6). In each of (9a-d) the domain of quantification seems to include people who have children *and* pets. I.e. the negative quantifier makes no difference:

(9) a. Everyone who has children or pets receives tax benefits
b. Everyone who has children or pets received tax benefits
c. No one who has children or pets received tax benefits
d. No one who has children or pets receives tax benefits

These data should make us suspicious. If the unilateralists are right, then we should understand all of these examples with downward entailing contexts in the same way - where ‘two Fs G’ has its unilateral interpretation. In fact, what we find is that the examples with numerals where there is a reading which is consistent the unilateralist view are only those where we can make some kind of presupposition about a covering law about receiving tax benefits. This is brought home by considering (10a) in two contexts (10b) and (10c):

(10) a. No one who has three children is happy
b. Context A: People in society under discussion tend to be more stressed the more children they have
c. Context B: The society under discussion is poor and more children means more prosperity

Indeed, contrary to the unilateralist view, it seems the that this data could be better explained if we assumed that numerals have a bilateral, ‘exactly’ meaning. In the case of (6a) the understanding could be explained by the presupposed covering law. This alternative account would also better explain the facts in (6d). The implication for (6d) could not be analysed as a conversational implicature based on the Quantity maxim if we assume that the meaning of ‘two’ is unilateral. It *could be* a quantity implicature if we assume a bilateral meaning for numerals and a contextual question along the lines of, ‘What’s the greatest number of children one can have and not receive benefits’.

Given that in many of these downward entailing cases, our intuitions would be explained if we assume the numerals are interpreted bilaterally, there is another problem for the unilateral view: normally, bilateral interpretations of scalars terns in DE contexts involves a marked operation (needing focus or special contexts). Eg where ‘some’ is concerned, there is no bilateral interpretation unless there is focus on ‘some’. Consider that (11a) wouldn’t be considered false given (11c) whereas (11b) would:

(11) a. John didn’t answer SOME_F of the questions
b. John $\text{DIDN'}\text{t}_F$ answer some of the questions
c. Fact: John actually answered all ten of the questions

With focus on the polarity expression (as in (11b)), one could suppose that the example is read as a direct response to 'John answered some of the questions' where normally the scalar implicature is conveyed. Only if the focus is on "some" (as in (11)), do we get the reading where 'some and not all' is denied. We will return to this phenomenon in the second part of the paper.

Summary: There is unexpected behavior of numerals in DE contexts. In contrast to 'some' and 'or' it does not look like the favoured reading in DE contexts is the unilateral reading. It looks like 'at least' reading for numerals in DE contexts turns on special presuppositions. This weakens the case for the unilateral view since the 'at least' reading should be the 'default'.

Where there is a bilateral interpretation of numerals in DE contexts, unilateralists would have to concede that some form of *pragmatic intrusion* is going on. This form of intrusion yields a weaker interpretation overall than the literal meaning. This effect is not explicable in terms of (neo-) Gricean principles.

II Questions (Horn 1992): Consider the possible answers to the question in (12a). The markedness of the answer to the 'at least' construal of the question is in contrast to the opposite pattern of markedness in the 'many' and disjunction cases.

(12) a. Do you have three children?
b. No. I have two
c. No. I have four
d. ?Yes. (In fact) I have four

(13) a. Do some of your friends have children?
b. ?No. All of them do
c. Yes. (In fact) all of them do

(14) a. Did John or Mary pass the exam?
b. ?No. They both did
c. Yes. (In fact) they both did

On a Gricean view of scalar implications, the oddness in (13) and (14) make sense, since in the context of questions, the quantity maxims do not apply (questions in fact set the level of informativeness required). So, the pattern in (12) is unexpected if numerals have a unilateral meaning.

III Distribution of readings in root clauses: The implication of (1a) suggested in (1b) is meant to be a defeasible pragmatic implication. Factors which normally give rise to the cancellation of such implications are (i) explicit denial, (ii) contextual relevance or (iii) contextual or world knowledge. (15b) and (16b) are cases where contextual/world knowledge blocks a defeasible inference:

(15) a. Mary enjoyed the book
{Defeasibly implies the enjoyment stems from reading}
b. The goat enjoyed the book (Lascarides & Copestake)

(16) a. John got into a car
{The car was not John’s own}
b. The rich man went into his garage and got into a car

According to unilateralists, the ‘at most’ implication for numerals is defeasible and should be cancellable where world knowledge dictates. But consider (17a,b) - where in spite of world knowledge, they tend to be read as having bilateral interpretations:

(17) a. ?Two people watched the big football final
b. ??Two people played in the big football final

Here things seem the other way around. It seems that, in order that we get the ‘at least two’ readings in root clauses, we need some special kinds of context. In particular, we need contexts where the speaker is employing the rhetorical device of introducing individuals (for instance, into a narrative).

(18) a. ?Let me tell you a story. Two people watched the big football final...
b. Let me tell you a story. Two people were watching the big football final...

The ‘at least’ reading becomes easier in (18b) where we use the English imperfective. This is a standard device for ‘zooming in’ on a specific situation.

The individual-introducing rhetorical move is usually employed in examples to motivate dynamic analyses of anaphoric relations:

(19) (Let me tell you a story) Two men were walking in the park. They were whistling.

Example discourses such as in (18b) and (19) are an important source for intuitions that numeral terms have unilateral meanings. It is important to note here that while the discourses in (19) as a whole does not imply that only two men walked in the park, the speaker’s referent introduced in the first sentence is a collection containing exactly two men (the set containing the two men the speaker has in mind - see Stalnaker 1998). This speaker’s referent is then the referent of the pronoun in the second sentence. According to the analysis in Stalnaker (1998), the proposition that at least two men were walking in the park and were whistling does not directly follow from what is said by the constituent sentences but can only be obtained through some combination of what is said and a pragmatic inference.

1.3 Alternatives to the Unilateral View of Numerals

It has become more widely accepted that the unilateralist position for numerals is not well supported. This is in contrast to the unilateralist position for ‘some’ and ‘or’. Considerations like those above have led many to make an exception of the numerals among so-called scalar terms.

Carston (1998) entertains two analyses of numerals. One is the bilateral account being defended here. The other is an ‘underspecification’ account. According to the latter, whether a numeral is understood as 'at least n', 'exactly n' or 'at most n' could be left unspecified by the meaning of "n Fs" - just as the relation between John and the book in "John's book" is unspecified by the meaning of the possessive construction. Although she expresses a mild preference for the underspecification account, she leaves the matter open.

Some of the data discussed above suggest that the underspecification account may not be correct. For example, it does not explain the asymmetry in the downward entailing contexts (I) and root clause cases (III). For instance, one would expect a general default-to-the-strongest-meaning strategy being employed in DE cases. That is, given the underspecification proposal it is open whether numerals have a unilateral or bilateral interpretation and only the context is the determining factor. But it is well known that where there are two logically related candidate interpretations of an expression, then the interpretation which is favoured, *ceteris paribus,* is the logically stronger. In the DE case, this would be the unilateral interpretation. But intuition suggests that in DE contexts the bi-lateral interpretation is favoured.

One would also expect an 'at least' preference in root clauses where world knowledge is incompatible with the 'exactly' reading. But, again, intuition suggests that we understand numerals bilaterally even where this understanding conflicts with world knowledge. This suggests that the interpretations are not underspecified by the meaning in the way Carston suggests.[1]

Of the other discussions of numerals mentioned, although Horn (1992) provides much evidence for the fact that numerals are not the same as other scalar terms, no positive account is offered. Geurts (1998) only says that 'two' has a bilateral meaning. (It could also, therefore be homonymous between a unilateral and bilateral meaning). No account of cases where there is an 'at least' reading for numerals is offered.

Kratzer (2003) suggests that it wouldn't be crazy to say that all scalar terms have bilateral meaning if one assumed that all natural language predicate expressions contain situation variables and that what NL sentences express is a property of situations. Thus:

(20) a. $||\text{some children}|| = \lambda P\lambda s.\ \exists x[\text{child}(x)(w_s)\ \&\ P(x)(s)]\ \&\ \exists x[\text{child}(x)(w_s)\ \&\ \neg P(x)(s)]$

b. $||\text{two children}|| = \lambda P\lambda s.\ |\{x: \text{children}(x)(w_s)\ \&\ P(x)(s)\}| = 2$

As Kratzer observes, one could get an account of the different readings by assuming that either the situation variable is fixed by context or 'bound by the usual existential closure operations'. But in fact she does not advocate this analysis since, according to (20), the proposition which "Some/Two children play" expresses would not be persistent.

---

[1] Carston's proposal may seem to have an advantage over the current one since it also covers the 'at most' reading of numerals that arises in modal and related contexts - eg (i):

(i) I can fit four people in my car

While there is little room to discuss these cases in detail, it will hopefully be apparent that, given a bilateral meaning for numerals, the 'at most' reading would follow as plausible inferences in these contexts.

Independently of theory-internal problems, Kratzer’s idea seems to be on the right track - at least for numerals. Where the speaker gets us to ‘zoom in’ to some specific situation, then there is no impression that “Two Fs G” implies that no Fs have G beyond the situation under discussion. Somehow in these cases we restrict what is said to be just about this specific situation.

1.4 Proposal

So, the proposal is that numerals have a bilateral meaning. For instance:

(21) two Fs G $\leftrightarrow |\cup\{X: F(X) \wedge G(X)\}| = 2$

In cases where there is an ‘at least reading’ this can be due either to contextual restriction (to a specific situation), speaker presupposition or both. In the next section, I will discuss how contextual restriction involving specific situations may be accounted for.

1.5 Contextual Restriction: Situation variables or ‘Contextual Supplementation’?

Kratzer’s (2003) suggestions for the bi-lateralist treatment of scalar terms is of a piece with Kratzer (2004) which motivates the use of situation variables in natural language predicates as a means to account for implicit contextual restriction in quantification. The use of situation variables for quantifier domain restriction is familiar from Barwise & Perry (1983) who introduced the idea of a ‘resource situation’. The restriction of predicates in natural language to specific situations is less often discussed but just as easily motivated. For instance, we normally understand what is said by (22) to be about a specific place. This fact could be explained in terms of the reference of a situation variable - of the type Kratzer suggests.

(22) It’s raining

However, there is a well-known argument due to Soames (1986) contra Barwise & Perry that not all restriction can be via the reference of situation variables. The strategy Soames adopted to demonstrate this involved the referential-attributive use of definite descriptions. The idea is that there are cases of so-called incomplete descriptions that only involve some kind of attributive characterisation of the reference, so that what is said does not involve the individual in the resource situation directly. For example, the truth-conditions of the proposition expressed by an utterance of (23) upon the discovery of the mutilated body of Smith does not involve the actual murderer across counterfactual possible worlds. But they would do if the (murder) situation under discussion were meant to supply the contextual information:

(23) The murderer is insane

Similar considerations apply to cases of implicit propositional restriction - demonstrated by (22) above. An example parallel to Soames’ (23) would involving a non-persistent sentence where the contextually determined proposition is, in the appropriate sense, attributive. So, were (24) to be uttered upon the discovery of Smith's body floating down a river, then the relevant resource situation would be that preceding Smith's death (by multiple stabbing). But the intended proposition expressed would be attributive - that Smith wasn't stabbed just once in whatever situation he was murdered.

(24) Smith wasn't stabbed just once

So, there is reason to be sceptical that situation variables alone will suffice to account for implicit restriction. Moreover, there is reason to think that the presence of such variables in linguistic forms complicates the analysis of quantificational sentences. This is so since special stipulations would be required for non-monotonic quantification - given Kratzer's own persistence criterion. That is, in order to preserve this criterion, one would have to specify that what a sentence like 'Exactly two Fs G' expresses is only a function of total situations (worlds).

So, while we want to claim in this paper that utterances can be about specific situations - in some sense - we will avoid the complications of Kratzer's framework by assuming that what general statements (containing quantificational expressions) express is a function of worlds. We will assume instead that reference to less-than-worldly situations using general statements is indirect and that specification of such situations can appear as part of what gets expressed via implicit contextual restriction. (Cf Kripke (1977) on referential uses of definite descriptions).

Apart from Kratzer's approach (and outside of dynamic approaches), contextual restriction is accounted for either with hidden variables (Stanley 2000, Stanley & Szabo 2000) or not (see Perry 1998, Recanati 2002, Breheny 2003 i.a.). Either way, we end up with a proposition where the contextually supplied material itself is (or can be) attributive. This assumption happens to conflict with Soames' precept that only objects can be supplied by context. There is however reason to think that Soames' precept is too severe (see Stanley & Szabo, 2000). In what follows, we will not adopt any particular framework for the analysis of contextual restriction. Instead we will offer descriptive characterisations of the effects of contextual supplementation - however achieved.

1.6 (Implicit) Specificity in Utterances

The main idea to be employed here is that implicit contextual restriction can involve a kind of *token-reflexive*, *deferential* situational specification (or token-reflexive, deferential individual specification). I.e. the restriction will be along the lines of 'whatever is the identifying situation type the speaker has in mind in uttering u'. The predicate expression $certain_u$ will be used in translations for such a description:

(25) a. $certain^s_u$ to express the identifying property (of situations) which the speaker has in mind in making u.
b. $certain^i_u$ to express the identifying property (of individuals) the speaker has in mind in uttering u.

In both cases, $certain_u$ is necessarily satisfied by one thing if at all.

Let's reconsider (19):

(19) Two men were walking in the park. They were whistling

Following Stalnaker (1998) (see also Breheny 2004, 2002), we get the geachian reading for such discourses where we make assumptions about the speaker's ground for her utterance. We can suppose that we have the option of restricting the interpretation of the first sentence along the lines in (26) where the bracketed material is supplied by contextual supplementation.

(26) Two men were walking in the park [in a certain$^{s}_{u}$ situation].

We have independent motivation for this kind of contextual supplementation from the case of specific indefinites. Both (27a,b) can be understood so that they do not imply (28a) but (28b)

(27) a. If a certain uncle of John's dies, John will be rich
b. If an uncle of John's dies, John will be rich

(28) a. $\exists x[\text{uncle\_of\_j}(x) \wedge \text{die}(x)] \rightarrow \text{rich}(j)$
b. $\exists x[\text{uncle\_of\_j}(x) \wedge (\text{die}(x) \rightarrow \text{rich}(j))]$

An appealing analysis of both (27a,b) is that the indefinite is behaving more like a definite description, picking out a unique individual. Which individual? The one which figures as the denotation of an identifying property in the speaker's ground for the claim. The role of 'certain' in (27a) is to express that identifying property explicitly, but in (27b) we need to assume that this property enters what is expressed via implicit contextual supplementation. Thus, the proposition expressed in both cases can be rendered as in (29):

(29) $\exists x[\text{certain}^{i}_{u}(x) \wedge \text{uncle\_of\_j}(x) \wedge \text{die}(x)] \rightarrow \text{rich}(j)$

As appealing as this analysis is, it has its detractors who feel that it is not sufficient. One kind of argument to this effect turns on the observation that not all uses of even explicitly specific indefinites involve the speaker having an individual 'in mind'.

I have argued elsewhere (see Breheny 2002/3) that many apparent cases where specifics are used without the speaker having someone definite in mind are cases where there is a deferential property attribution in the mind of the speaker herself. Important in that account is the idea of *notion networks* from Perry (2001). These constitute the basis of causal chains among agents' representations of some individual. Where one agent gains information about an individual from a second agent's utterance, it may be that the only identifying property the first agent can attribute to the individual under discussion is that of standing at the end of the notion network in which the second agent's notion is embedded.

While contextual supplementation involving a specific situation could account for 'at least two' readings of numerals in root clauses, there are still many other kinds of case where there seems to be unilateral reading.

Let us consider again(6a):

6a. Everyone who has two children receives tax benefits

{Implies that the same goes for 3 kids, 4 kids etc}

Assuming the bilateral analysis for 'two', the appearance of a unilateral reading may due to a presupposed covering law:

(30) Tax benefit laws are designed such that for each number above the minimum fixed by the government, everyone with that number of children receives benefit.

As was suggested above, this kind of account is consistent with our intuitions where it is difficult to infer such a covering law - such as in (7).

But there may be cases where in a DE or other context, we want to say that what is conveyed involves a unilateral proposition. For example, we may wish to say that (31a) expresses a proposition similar to that for (31b) in a case where (31a) itself is embedded - as in (31c):

(31) a. If two students fail then the teacher will be fired
b. If any two students (in the context) fail then the teacher will be fired
c. It's not true that if two students fail then the teacher will be fired

This kind of problem is similar to that raised in Chierchia (2001a) in relation to our account of specific indefinites (outlined in relation to (27) above). Chierchia's objection to our account involves an 'intermediate scope' reading of a specific indefinite where negation is involved. Consider that both (32a,b) can be read as being equivalent to (32c):

(32) a. It's not the case that if an uncle of John's dies, John will be rich
b. It's not the case that if a certain uncle of John's dies, John will be rich
c. $\neg \exists x\ [\text{uncle\_of\_J}(x) \wedge (\text{dies}(x) \rightarrow \text{rich}(J))]$

For cases like these, Chierchia suggests that one needs an analysis of indefinites as introducing a variable (over choice functions) which can be bound by a free existential closure mechanism. But such a proposal has little appeal since there is no independent motivation for such a mechanism existing in language.

For both kinds of case, (31) and (32), we need further presuppositions about the type of the individual or situation the speaker has in mind (see Breheny 2002). In the case of (32), we could presuppose (33) (where □ is for speaker presupposition):

(33) $\forall x\ \Box \text{certain}_u(x) \rightarrow (\exists y[\text{uncle\_of\_john}(y) \wedge (\text{die}(y) \rightarrow \text{rich}(j))] \rightarrow (\text{die}(x) \rightarrow \text{rich}(j)))$

This says that it is presupposed about the identifying property that whatever it applies to is such that if there is an uncle of John's who is such that if he dies John gets rich then the certain_u uncle is such that if it dies, John gets rich.

In general, if we have the specific indefinite in the scope of some operator, *O...a certain F*, and this whole construction is in some downward entailing environment, *neg O...a certain F*, then we can always construct such a presupposition for *certain* so that we can have the intermediate scope effect without movement. Suppose $\phi(x)$ is the result of extracting *a certain F* from inside the operator, *O...*, then the presupposition in general looks like:

(34) $\forall x\ \Box \text{certain}_u(x) \rightarrow (\exists y[Fy \wedge \phi(y)] \rightarrow \phi(x))$

A similar analysis can be given for the cardinal case where the contextually supplied restriction can characterize a specific situation - as above. Consider again (31a) with an 'at least' reading as in (31b). The local ∃-closure effect can be achieved firstly if, 'two students fail' is contextually restricted as 'two students fail in a certain^s_u situation'; and secondly the presupposition in (35) is made (where $s \models \phi$ reads 'ϕ holds in s'):[2]

(35) $\Box_w\ \forall s\ [s \subseteq w \wedge \text{certain}_u(s) \rightarrow (\exists s'\ [s' \subseteq w \wedge s' \models \text{two(student')(fail')}] \rightarrow s \models \text{two(student')(fail')})$

The kinds of situation type which would be appropriate include the one where the first two students who fail fail.

Other cases where there is a fairly clear embedded 'at least' reading include universal modal contexts, predictions and bets ((37) is taken from Carston 1998):

(36) a. There were many crumbs on John's sweater, so he must have eaten two cookies
b. You must have two A-grades to get onto this course

(37) a. I bet there will be twenty people there tonight
b. I predict there will be twenty people there tonight

In each case, it could be assumed that the speaker gets us to make a presupposition about the specific situation that makes the embedded sentence containing the numeral true. The general schema for such presuppositions is given in (38) where *R* is the relevant accessibility relation for the modals used in (36) and (37):

(38) $\Box_w\ \forall w'\ [w'Rw \rightarrow \forall s\ [s \subseteq w' \wedge \text{certain}_u(s) \rightarrow (\exists s'\ [s' \subseteq w' \wedge s' \models \text{two}(F)(G)] \rightarrow s \models \text{two}(F)(G))$

2 'Some': A Globalist or Localist Account?

The unilateralist view of 'some' goes roughly as follows: 'Some Fs G' has a unilateral

[2] See Cooper 1996 for GQ relations and situations. Note that while we are assuming that semantic conventions dictate that quantificational sentences express Russellian propositions, this presupposition assumes that *two(student)(fail)* can hold in situations. We do not pursue the details of that idea here but assume it is intuitively clear what this means.

meaning and where it is understood to imply that not all Fs G, this is due to some form of pragmatic inference based on Quantity principles. This view is much less problematic than the numeral case. There are however different versions of the unilateral view available. In this section, the unilateralist view of ‘some’ is adopted and some proposals are made concerning the lexical meaning and pragmatics of ‘some’ which hopefully make a *globalist* account of the computation of the pragmatic inference more desirable. The globalist account of a given pragmatic inference just says the inference is made based on global pragmatic principles as they apply to the given utterance in the given context. Alternatives to the globalist account exist in a variety of forms. Recently, Chierchia (2001b) has defended a localist account according to which common scalar implicatures are computed as default components of the model-theoretic, compositional interpretation of the trigger-containing sentence. A key factor Chierchia uses to support his view concerns the embedding of scalar implicatures in the scope of epistemic verbs and other contexts. Here I will explain how one could maintain a globalist account in such cases.

The first step is to say something about the lexical meaning of ‘some’. Intuition suggests it means simply, ‘a quantity of’. Here is a suggested translation based on that intuition:

(39) $\text{some}_{\text{count}}' = \lambda P,Q\ \exists n[\text{cardinal}(n) \wedge n(P)(Q)]$
$[\text{where } n(P)(Q) \leftrightarrow |\cup\{X{:}P(X) \wedge Q(X)\}| = n]$

Although the lexical meaning of ‘some’ is comparable to ‘a quantity of’, when it is used, the speaker may be suggesting something about the grounds he has for his utterance. In particular, the speaker may be suggesting he has a specific quantity in mind. This can be built into what gets expressed by the utterance as part of an implicit contextual restriction:

(40) $\lambda P,Q[\ \exists n\ [n \in \text{Card} \wedge \text{certain}_u(n) \wedge n(P)(Q)]]$.

Such contextual variability of determiner meanings is attested elsewhere - particularly with ‘many’ and ‘few’. Even ‘most’ is often understood as ‘almost all’ rather than ‘more than half’. So there is motivation that determiner interpretations may involve implicit contextual supplementation, just as their restrictors do.

Where the contextual supplementation suggested in (40) is made, and where it would be more relevant to know whether the totality of Fs have G, then we have the key condition for a scalar implicature - since the speaker could just as well have said ‘all’. That is, assuming we can take for granted that the speaker is in a position to know whether all Fs G and assuming he would tell us if he knew, then we can infer that he does not tell us because he thinks (knows) it to be not true. Hence we infer that not all F’s G.

Note that this could be referred to as a scalar implicature given the form that the inference takes. However, the content of that implication can be accommodated via a presupposition about *certain*$_u$ - the quantity the speaker has in mind. I.e. in each alternative in the context set, the quantity of Fs which G is not the totality of Fs.

Given that the content of this pragmatic inference can be accommodated via speaker presupposition about the content of what ‘some Fs G’ expresses, we account for

Chierchia’s (2001b) examples where the implicature is apparently in the scope of ‘believes’. Eg (41) could be understood so that the speaker presupposes that in each of John’s epistemic alternatives, exactly a certain non-total quantity of Mary’s students do syntax.

(41) John thinks that some of Mary’s students work on syntax

That is, the embedded sentence in (41) could be rendered, $\exists n\ [n \in Card \wedge certain_u(n) \wedge n(M's\ students')(work\_on\_syntax')]$ where it is presupposed that the quantity the speaker has in mind is non-total. So, the motivation for this case of ‘embedded implicature’ is still an application of scalar implicature based on a Quantity principle.

The treatment of ‘some’ being suggested here is based on the idea that the determiner’s interpretation is open to contextual specification and that 'some' is relatively non-specific about quantity. Other determiners which give rise to scalar implicatures include, ‘many’, ‘most’, ‘more than half’, ‘a few’ are similar to ‘some’ in as far as they relatively unspecific about quantity. Thus we could motivate a similar treatment of these determiners involving implicit contextual restriction so that scalar implicatures could be built into their interpretation.

The issue of other scalar triggers and their embedability is left open for another occasion save for the observation that one must look at things on a case by case basis. For example, it is very difficult to get embedded implicatures with disjunction. This can be illustrated with the pair in (44a,b).

(44) a. If you eat SOME of the cake, you won't get fat
b. If you eat the cake OR the cookies you won't get fat

In (44a) the implicature can be understood as embedded in the antecedent. By contrast, it is very difficult to understand (44b) to mean that you will get fat if you eat both the cake and cookies. Given that this is a genuine asymmetry, one could suppose that it is due, in part, to the fact that disjunction is relatively resistant to contextual supplementation.

3 Conclusion

Hopefully, the arguments of this paper add force to the to the suggestion that numerals ought to be treated differently to other scalar terms. Perhaps one reason why there has not been a broader consensus on this matter already has to do with the very many cases where numerals are apparently understood to mean 'at least n'. In this paper, I have tried to work through some of the more salient cases and give an account of the 'at least' readings in pragmatic terms. Crucial use was made of the idea of contextual supplementation, of the ideas concerning specificity and also of speaker presupposition. These three factors were also made use of in a defence of the 'globalist' treatment of genuine scalar implicature cases - like 'some'. The 'globalist' treatment has been under threat from proponents of the idea that common scalar implications are somehow grammaticalised. The basis of this alternative stems from the apparent embedability of these implications. Here, an account was given of how the content of these genuinely global inferences may come to be embedded.

References

Breheny, R.: 2002, ‘Non-dynamic analyses of anaphoric pronouns: Do things look better in 2-D?’, (Forthcoming in M. Garcia-Carpentero (ed) *Two Dimensionalism*. OUP)

Breheny, R.: 2002/3, Folk ideas about reference and specific indefinites (revised s&b7 paper) ms U. of Cambridge

Breheny, R.: 2003, ‘A lexicalist account of implicit (bound) contextual dependence’, *Proceedings of SALT13*.

Carston, R.: 1988, Implicature, explicature and truth-theoretic semantics. In: R. Kempson (ed.) *Mental Representations: the Interface between Language and Reality*. pp.155-181. CUP, Cambridge.

Carston, R.: 1998, Informativeness, relevance and scalar implicature. In: R. Carston & S. Uchida (eds.) 1998. Relevance Theory: Applications and Implications, 179-236. John Benjamins, Amsterdam.

Chierchia, G.: 2001a, ‘A puzzle about indefinites’, in Cecchetto et al (eds) *Semantic Interfaces*. CSLI, Stanford, Ca.

Chierchia, G.: 2001b, Scalar implicatures, polarity phenomena and the syntax/pragmatics interface. (ms.) University of Milan Bicocca.

Cooper, R.: 1996, Situation Semantics In S. Lappin (ed) *Handbook of Semantics* Blackwells

Geurts, B.: 1998, Scalars, in Ludwig & Geurts eds Lexikalische Semantik aus Kognitiver Sicht.

Horn, L.: 1992, The said and the unsaid. Ohio State University Working Papers in Linguistics (SALT II Proceedings) 40, 163-192

Kratzer, A.: 2003, ‘Scalar implicatures: Are there any?’ *SemanticsNet*

Kratzer, A.: 2004, ‘Domain Restriction’ *SemanticsNet*

Kripke, S.: 1977, Speaker Reference and Semantic Reference. In P. A. French et al. (eds.) *Contemporary Perspectives in the Philosophy of Language*. Minneapolis: University of Minnesota Press.

Perry, J.: 1998, ‘Indexicals Contexts & Unarticulated Constituents’ in *LL&C Proceedings* CSLI

Perry, J.: 2001, *Reference and Reflexivity*, CSLI Publications, Stanford, Ca.

Recanati, F.: 2002, Unarticulated Constituents. In *L&P* 25:299-345.

van Rooy, R. & K. Shulz: 2004, Pragmatic meaning and non-monotonic reasoning: The case of exhaustive interpretation. ms

Soames, S.: 1986, Incomplete Definite Descriptions. *Notre Dame Journal of Formal Logic* 27: 349-375.

Stalnaker, R.: 1998, ‘On the representation of context’, *Journal of Logic, Language and Information,* 7, 13-19.

Stanley, J. & Z. Szabo: 2000, ‘On quantifier domain restriction’, *Mind and Language* 15:219-261.