Argumentative properties of pragmatic inferences

Grégoire Winterstein*

Laboratoire de Linguistique Formelle - Université Paris Denis Diderot-CNRS
gregoire.winterstein *AT* linguist.jussieu.fr

Abstract. In this paper we propose an argumentative account for a discourse constraint on the reinforcement of some implicatures. We argue that this constraint is not due to the nature of inferences at hand but rather on distinct argumentative relations between the propositions they express. We examine the effect of these relations on the possible discourse relations a speaker is entitled to use in his discourse and the links between argumentative properties and logical relations such as entailment.

This paper seeks to provide an explanation for the often overlooked discourse constraints that intervene when cancelling or re-asserting the content of some implicatures. Conversational implicatures as described by Grice (1989) are parts of the meaning of a sentence that aren't part of what a speaker *said* in Grice's favoured sense. As such, they can supposedly both be freely reasserted or explicitely cancelled since they were never actually uttered and thus never "officially" endorsed by the speaker. As we'll show in this paper it turns out that the discourse segments reasserting or cancelling implicatures can be connected to the utterance tht gives rise to the implicature only by some discourse connectives.

In the first section we do a survey of the kind of such discursive constraints and evaluate an explanation that would solely rely on inference mechanisms. We show how this approach is flawed and in therest of this work we aim at giving an explanation of these facts in an argumentative perspective based on the works of Anscombre and Ducrot and later proposals by Merin. In the second section we summarize the argumentative approach to pragmatics. We claim that some implicatures are in a systematic rhetorical opposition to the utterance they are derived from, a fact which licenses the use of a contrast for reinforcement. We also underscore how an *exhaustivity* account (as expounded by van Rooij (2004)), that also includes argumentativity, allows the same kind of predictions. In the third section we go on to predict and validate some of the consequences of this approach, most notably with its influence on items related by logical relations such as entailment. Besides *licensing* it, this opposition seemingly *requires* the presence of contrast. We propose two different views to explain this preference

* I thank Pascal Amsili, Jacques Jayez, Frédéric Laurens, François Mouret and the audiences at *JSM'08* and *FSIM'4* for their precious help and comments about previous versions of parts of this work.

in the fourth section. Our conclusion outlines the direction we wish to give to our future work.

1 Overview of the Data

1.1 Core data

The data presented in (1) is our prime example of study. In (1b) *B*'s answer is interpreted as carrying with it the implicature in (1c)[1]. This is a standard example of *scalar implicature* as presented, among others, in (Horn 1989).

(1) a. *A:* Do you know whether John will come?
b. *B:* It's possible
c. +>It's not sure (that John will come)
d. It's possible, but it's not sure

The inference (1c) can be reinforced as in (1d). What interests us is that an utterance such as (2), without an adversative discourse marker, sounds degraded compared to (1d) (as an answer to (1a)).

(2) *B:* # It's possible and it's not sure

We think that the preference for (1d) over (2) is somehow unexpected. Since the implicature (1c) is non-controversially conveyed by the utterance of (1b), one has to explain how it can be construed as "opposed" to the utterance that allowed its presence in the first place (as suggested by the adversative *but*). A similar fact is already noted in (Anscombre and Ducrot 1983) about example (3).

(3) Pierre s'imagine que Jacques et moi sommes de vieilles connaissances, mais pourtant on ne s'est jamais rencontrés
Pierre figures that Jacques and I are old-time friends, but we never met

Example (3) illustrates the difference between their notions of argumentation[2] and inference. In the case of (3) although the first part of the utterance allows an inference towards the second part, it is nevertheless argumentatively opposed to it and thus licences a contrast. Horn (1991) shows that more generally any kind of content related to an utterance U (by relations of implicature, presupposition, logical entailment...) can be felicitously reasserted as long it is argumentatively

[1] We use the notation $A+>B$ to mean that the utterance of A implicates B

[2] The notion of *argumentation* is rooted in Anscombre and Ducrot's view on discourse. According to them a speaker always *talk to a point* and his utterances *argue* for a certain conclusion, quite often the topic of the discourse, which may or may not be explicit. Merin considers that understanding what is this topic is what *"figuring out the speaker's apparent and real intentions"* is about. Anscombre and Ducrot consider that some linguistic items or structures, such as *almost*, bear specific argumentative properties and thus entertain a systematic argumentative opposition or correlation with other propositions.

opposed to U. Therefore, as unexpected as the preference for a contrast might be in (1d), the situation appears common.

This prompts us to look at the argumentative properties of the implicatures relative to their mother-utterance. More precisely what we intend to find is whether the content of the implicatures can be argumentatively opposed to the content of their mother-utterances (regarding a certain goal), we shall call this the *argumentative relation* between the two propositions. Two configurations are possible:

1. The argumentative relation between implicature and mother-utterance depends on the *nature of the inference*. Different types of implicatures would have different, systematic, argumentative properties.
2. The argumentative relation between implicature and mother-utterance is variable and depends on the *context of utterance*. The same inference could entertain one type relation in a context and the opposite in another.

The first option has already been proposed and we examine it in Sect.1.2. We show that this leads to a number of wrong predictions and then go on to explore the second option in Sect.2.

On a last note about the core-data, we wish to mention the case of the scale of quantifiers: $\langle all, some \rangle$. Usually, scalar implicatures are exemplified with this latter scale as in (4).

(4) a. *A:* How is your experiment going?
b. *B:* I tested some of the subjects.
c. $+>B$ didn't test all the subjects.
d. I tested some of the subjects, but not all.
e. # I tested some of the subjects, and not all.

We prefer to rely on (1) because the preference for using an adversative appears stronger in (1d) than in (4d). Neither (2) nor (4e) can be entirely ruled out. Both can be used as *corrections* of a previous statements (in those cases they would probably have specific prosodic patterns). But we also observe that the preference for marking a contrast is less strong for the examples with quantifiers outside of correction cases. Simple Google searches for the french *quelques-uns et pas tous* or english *some and not all* yield several thousands of occurrences, not all of them corrections, whereas a search for *possible and not certain* only provides results of the form ***only*** *possible and not certain*. The presence of the adverb *only* restricts the meaning of *possible* and these examples aren't conclusive compared to the *some and not all* ones. However the effect of *only* is an interesting one and we shall return to it below.

1.2 The Limits of Inference

Benndorf and Koenig (1998) (now *BK*) worked on data related to (1) and (4). They were interested in the dual operation of reinforcement, namely *cancellation*. They observe that the class of implicatures that can be felicitously cancelled by

marking a *Contrast* discourse relation are exactly the implicatures that were described as *R-based* in (Horn 1989) among others[3]. They also observe that the other class of implicatures, the *Q-based* ones, can't be cancelled in the same way. We briefly sum up their main observations and conclusions and then show how their proposals aren't satisfactory.

***R-based* Implicatures** Examples of the cancellation of *R-based* implicatures are presented in (5). An adversative connective is preferred to connect the two discourse segments.

(5) a. Gwen took off her socks and jumped into bed, but not in that order
b. Billy cut a finger, but not his
c. Sam and Max moved the piano, but not together

Unsurprisingly, a reinforcement of the same implicatures is odd when using an adversative[4].

(6) a. # Gwen took off her socks and jumped into bed, but in that order
b. # Billy cut a finger, but it was his
c. # Sam and Max moved the piano, but together

***Q-based* Implicatures** Alongside *R-based* implicatures, Horn also describes *Q-based* implicatures. These are more familiar because this class includes the class of *scalar* implicatures such as those in (1) and (4). More generally these inferences are essentially negative in nature : a Q-implicated meaning is calculated by taking into account which stronger, or more informative, relevant forms the speaker could have uttered but chose not to. This notion of Q-implicatures subsumes Levinson's Q and M-implicatures.
This class of implicatures apparently can't be cancelled by marking a *Contrast* relation, as shown with various types of Q-based implicatures in (7): clausal in (7a) (as first described by Gazdar (1979)), based on attitude predicates in (7b), based on the maxim of Manner in (7c) (this example falls under Levinson's M-maxim), and the scalar case already encountered in (7d).

(7) a. Bill is in the kitchen or the living room, (?but/and in fact) I know which
b. John thinks that Mary is pregnant, (?but/and in fact) she is indeed expecting a child

[3] *R-based* implicatures are enrichments of an utterance related to underspecified aspects of the propositional content (temporal ordering, causal relations etc.) They come about in a wide variety of shapes. In (Levinson 2000) these inferences are called *I-based* implicatures.

[4] It should be noted that the sentences in (6) are out only under the assumption that the considered implicatures are present. It is easy to imagine contexts for which all these sentences are correct. For example if sentence (6b) is uttered about some mafia henchman who breaks other people's fingers on a daily basis the sentence is quite felicitous but the implicature we're interested in isn't conveyed.

c. Sam caused Max's death, (?but/and in fact) he actually killed him on purpose
d. It's possible that John will come, (?but/and in fact) it's a sure thing

These inferences all behave as in the core data of Sect.1.1: the use of an adversative for their reinforcement sounds better.

(8) a. Bill is in the kitchen or the living room, ?(but) I don't know which
b. John thinks that Mary is pregnant, ?(but) she's not
c. Sam caused Max's death, ?(but) he didn't kill him on purpose

Argumentation as an Inference Mechanism The motivation behind the presentation of this data by *BK* is to provide an inference-based description of the meaning of *but*. What their proposition entails is the following formalization of Ducrot's *argumentativity*:

(9) A proposition p argues towards a proposition q iff p R-implicates q

This comes from the fact that, according to Ducrot, *but* can only be used to connect two argumentatively opposed utterances. Since *R-based* implicatures are the only inferences that can be cancelled with this adversative, *BK* identify the *R-based* nature of inferences to that of argumentativity by adapting Ducrot's description of *but* as in (10).

(10) A sentence p *but* q is felicitous iff:
- H is an R-implicature or a world inference derived from p
- q together with the common ground entails $\neg H$

However, this can't be satisfactory for a number of reasons.

- This description of argumentation predicts unnatural inferences for a sentence such as (11).
(11) Mary almost fell but she caught herself.
If *but* required an R-inference opposite to its second conjunct to be derived from the first conjunct this would mean that the first part of the sentence would somehow R-implicate that Mary did fell. Since the first conjunct conventionally conveys that she didn't fell[5], the sentence would at the same time implicate and deny the same proposition. This is an undesirable situation, especially if we consider, after Grice, that an implicature is a part of meaning intended by speaker and acknowledged as such by the addressee (which would amount to the speaker being inconsistent).
- Should we find a context such that the cancellation of a *Q-based* implicature is done via a *Contrast* relation marked by an adversative connective the whole enterprise would be flawed. As it happens we believe (12) is such an example.
(12) a. *Mother:* I hope Kevin has been polite with Granny and he has managed to eat some of her terrible cookies.

[5] For a detailed study of the properties of *almost* see (Jayez and Tovena 2008).

b. *Father:* The problem is, he did eat some of them, but in fact he ate all of them and Granny said that he was greedy.

One could argue that the implicature from *some* to *not all* in (12b) isn't *Q-based* in this particular case and therefore still satisfies the criterion for argumentativity. This would mean that, depending on the context, there are two different mechanisms for drawing the same inference. Since the implicature in (12b) appears very similar to the one in (4c), up to the fact that cancelling it demands a reformulative item such as *in fact*, this is a very *ad-hoc* and unsatisfactory answer.

Thus we won't adopt an approach that identifies the nature of an inference with its argumentative properties. Not only will it enable us to treat the inferences in (12b) and (4c) in a parrallel manner, but it should also provide insight in cases where the presence of an implicature is dubious. As shown by various recent experimental data (Breheny et al. 2005; Noveck and Sperber 2007) implicatures are not generated by default but only on a case-to-case, context-specific, basis. Yet it seems that the preference for a contrast goes beyond these particular cases, which would mean that the roots of our puzzle are in the argumentative relations between propositions and not between an utterance and its inferences. This somehow makes the explanation of our core data much simpler. Taking the meaning of *some* as *more than 2 and possibly all*, there is a clear opposition with a *not all* interpretation. Things are however a bit more tricky: as shown by (12b) the argumentative relationship between the *some* and *not all* propositions can vary. Besides if one takes (13a), which is given in French for maximum certainty about its correctness, the opposition between *un peu/a bit* and *pas beaucoup/not much* is quite less evident. Even by ignoring a possible implicature, an utterance of *un peu/a bit* sounds incompatible with that of *beaucoup/much*, unlike *some* and *all*. Thus the opposition of *un peu* and *pas beaucoup/not much* isn't trivial and needs deeper analysis.

(13) a. John prendra un peu de gâteau mais pas beaucoup.
b. John will take a bit of cake but not much.

What we mean to investigate is on one hand the effect that this relation has on the discourse relations one can use to connect discourse segments and on the other hand the effect it has, if any, on the derivation of inferences.

2 The Argumentative Approach

In this section we begin by presenting the basis of an argumentative approach to inferential pragmatics. We base our presentation on the propositions of Ducrot and their later formalization by Merin.
Once these various elements are defined we see how they fit together to explain the data presented in Sect.1 and how they predict other patterns.

2.1 Base Mechanisms

Our examples involve two distinct, well-known, concepts. First these utterances involve the use of an adversative marker such as *but*, second their interpretations rely on the derivation of *conversational implicatures*. Each is described below with a side-note on an *exhaustivity*-based approach. A good presentation of all systems is given in (van Rooij 2004) and this will be our main inspiration in this section.

Adversatives Ducrot (1980) first described the contribution as *but* as in (14)[6].

(14) p is an argument for a proposition H and q is an argument for $\neg H$.

Merin (1999) adopts a probabilistic approach of Ducrot notion of argumentation. He identifies the notion of argumentation with that of *relevance*, as defined by Carnap[7].
Roughly, given a probability P over possible accessible worlds, a proposition p argues for a proposition q, iff p is positively relevant to q, *i.e.* if and only if knowing p increases the probability of q. For Merin the relevance of a proposition is defined regarding a particular proposition H: the goal of the discourse. In this he differs from Ducrot who considered that a proposition had systematic argumentative properties (for example a sentence *almost* p always argues in the same way as p although it conveys $\neg p$, as shown in (11)). Our data suggests an interpretation more in line with Merin's proposal.
We can then reformulate Ducrot's description as in (15) (where $r_H(p)$ stands for the relevance of proposition p to proposition H):

(15) A sentence p *but* q is felicitous iff there is a proposition H such that $r_H(p) > 0$ and $r_H(q) < 0$

Both Ducrot and Merin consider that the absolute value of the relevance of the second conjunct should be higher than that of the first conjunct. The validity of this point has been discussed in (van Rooij 2004) and since it has little bearing on the rest of this work we ignore this part of the description of the meaning of *but*.

Implicatures The proper derivation of implicatures has known various refinements in the argumentative perspective. The main argument behind this approach to implicatures is the possibility to give an account of various cases where no logical entailment scale is at play although there is indeed a preference over propositions (for numerous examples see (Hirschberg 1985)). Ducrot,

[6] We focus on one meaning of *but*, that corresponding to german *aber* or spanish *sino*. For a presentation of the different meanings of *but* see (Anscombre and Ducrot 1977).

[7] This notion of relevance is distinct from the one proposed by Sperber and Wilson (for a recent presentation see (Wilson and Sperber 2005) and for the differences between the two see (Merin 1999)).

and Merin after him, proposes to replace the ordering of items based on logical relations by a relevance-based order. The ordering of the items is determined on argumentative force relative to the issue at hand. The apparent ordering by informativity (typically assumed in neo-Gricean approaches) is due to the fact that more informative propositions usually have more argumentative values. In (Ducrot 1980):61 the derivation of an implicature such as (1b) is as follows:

- $\langle sure, possible \rangle_H$ is an *argumentative scale*, *i.e.* a simple utterance including *sure* has more argumentative power, regarding a certain conclusion H, than one relying on *possible*, and *possible* has a semantic "at least" interpretation
- the utterance of (1b) gets further interpreted by an *exhaustivity law* similar to standard Gricean reasoning and yields the desired meaning: since an utterance relying on *sure* would have been argumentatively superior and wasn't used, one is entitled to infer that the corresponding proposition is false

Merin's approach formalizes this in a slightly different way by postulating that in conversation a speaker S and a hearer H play a game such that they have *opposed* preferences. Roughly, S makes *claims* that the skeptical hearer H will try to *concede* in the less defavourable way possible for him. The content of S's claim, when asserting p, is the set of propositions that are *at least* as relevant to G, the issue at hand, as is p (Merin calls this set the *upward relevance cone* of p). The set of propositions that H is willing to concede is p's *downward relevance cone*: the set of propositions such that they are *at most* as relevant to G as is p. The net meaning of p is the intersection of the two cones which corresponds to the interpreted meaning.

Whatever the version one wishes to adopt, one fact remains true for all argumentative approaches: if p is an utterance from which a conversational implicature q is derived in either of the aforementioned manners, then q is the negation of a proposition $\neg q$ that is argumentatively superior to p. Therefore p and q are necessarily argumentatively opposed (since by Ducrot's *law of inversion* $sign(r_H(\neg p)) = -sign(r_H(p))$).

This last fact readily explains why, in the cases where an implicature is indeed derived as such, the argumentative properties of utterance and implicature are compatible with the requirements of an adversative like *but*.

The Case of Exhaustivity Robert van Rooij (2004) argues against some of the claims of Merin by showing how an exhaustivity-based approach accounts for the same data without running into some of the problems of Merin's approach. To treat all of Merin's examples he proposes a definition of exhaustivity that relies on argumentative properties, represented by *relevance*. We reproduce this definition in (16).

(16) $exh(A, L, h) = \{t \in [A] | \neg \exists t' \in [A] : t' <_h^L t\}$, where
- A is the sentence to be interpreted
- L is the set of alternatives induced by the expression

- h is the conversation's goal
- the ordering of states is defined as:
  $t' <_L^h t$ iff $V(h, \bigcap\{[B]|B \in L, t' \in [B]\}) < V(h, \bigcap\{[B]|B \in L, t \in [B]\})$
- V is a relevance function, possibly the same as Merin's, but not necessarily

An exhaustive interpretation of a sentence A contains all states that verify A and for which no more minimal state exists that also verifies A. The definition used here orders states on argumentative grounds. What changes from Merin's account is the actual mechanism for deriving inferences: intersection of relevance cones for Merin and exhaustification for van Rooij. This actually doesn't matter much to us. What matters is that all these mechanisms use a relevance function as a representation of the argumentative properties of a proposition and that the resulting implicatures have relevances that are signed differently from their mother-utterances.

3 Argumentative Predictions

Armed with the previous formalizations we can check how they work together to explain the data in Sect.1. The core data we wished to explain was the apparent correlation between Q-implicatures and a preference for marking a contrast when reinforcing these inferences. We then showed that the correlation wasn't a perfect one and that the preference is attested even in the absence of the inference, as suggested by experimental results. We centered our explanations around the argumentative properties of the different utterances. We shall now suppose two simple sentences of propositional forms p and q, both identical, except for the presence of a scalar item: p will contain a weak scalar[8] term, such as *possible*, and q will contain a strong scalar term such as *sure*. Borrowing loosely from Levinson, we will say that these sentences are related by a *presumptive* scale, one which might give rise to implicatures but doesn't necessarily do so. Such examples are p =*It's possible that John will come* and q =*It's sure that John will come*.
Taking relevance into account we distinguish between three situations, characterized by the relative order of the relevances of p and q with regard to a conversation goal H[9]:

A. $0 < r_H(p) < r_H(q)$
B. $r_H(q) < 0 < r_H(p)$
C. $0 < r_H(q) < r_H(p)$

[8] We use the term *scalar* in a restricted sense, and particularly not to convey the idea that a scalar implicature is to be deduced from its presence, but rather that on some accounts such an inference is supposed to be derived. The notion of scalarity should thus be understood as a logical relation holding between the items of the scale, for example as entailment or any partial-ordering (as proposed in (Hirschberg 1985)).

[9] Situations where $r_H(p) < 0$ would be symetric to the ones proposed with a goal $\neg H$. We don't need to take them into account.

We are now interested to the possible discourses formed by a combination of p or $\neg p$ and q or $\neg q$. Depending on the configurations above we expect different possibilities for using adversatives. We will also look at discourses formed with propositions not related by a presumptive scale.

3.1 Possible Discourses

We begin by excluding some types of discourses when p and q are related by a presumptive scale:

- Discourses of the form[10] $\neg p, q$ or $q, \neg p$ are contradictory except under a metalinguistic reading of the negation, which we choose to ignore here. They nevertheless form interesting cases which we shall examine in future work.
- The second segment of discourses of the form q, p or $\neg p, \neg q$ isn't informative because it is an entailment of the first. It's hard to build proper examples for such configurations with scalar terms. If the second term has a higher relevance (as in situation (C)) one could expect that these examples would be felicitous. However the assertion of the more relevant proposition carries with it an implicature that denies the first conjunct. If the first conjunct is already part of the Common Ground (from the assertion of the first discourse-segment) then the denotation of the second conjunct must be compatible with it. In the case of presumptive scale it means that the second segment must mean the same thing as the first and therefore that its relevance isn't different. Thus the utterance isn't felicitous for reasons of redundancy.

If we consider propositions that form an argumentative scale that isn't based on a presumptive linguistic scale these considerations don't stand anymore. We are limited to situation (A); the other two don't make sense since no lexical item can be the basis for skewed argumentative scales. The example presented in (17) (due to Hirschberg (1985)) taking place in a job interview context is such an example.

(17) a. *Recruiter:* Do you speak Portuguese?
b. *Applicant Jane:* My husband does.
c. +>Jane doesn't speak Portuguese.

The proposition *Jane speaks Portuguese* has higher relevance than *Jane's husband speaks Portuguese*. This example allows for discourse structures that we judged impossible in the case of entailment-related propositions. We try all discourse forms below, with the propositions related to the weak argumentation in first place in (18) and second place in (19).

(18) a. My husband speaks Portuguese and in fact I also do.
b. My husband speaks Portuguese but I don't.

[10] We use the notation p, q as a shortcut for a discourse made of two segments of propositional content p and q. The discourse connectives linking the two segments aren't represented in this notation.

c. ? My husband doesn't speak Portuguese but I do.
d. ? My husband doesn't speak Portuguese and I don't either.

(19) a. I speak Portuguese and my husband also does.
b. ? I speak Portuguese but my husband doesn't.
c. I don't speak Portuguese but my husband does.
d. ? I don't speak Portuguese and neither does my husband.

Sentences (18b) and (19c) closely correspond to our core data. The use of an adversative is almost obligatory in the given context. In the context of the job interview, (19c) might be better than (18), at least to some of our informants. This could be related to the fact that in (18b) the last segment disfavours Jane whereas in (19c) it favours her.
Four sentences appear irrelevant: (18cc,d) and (19bb,d). They all have in common the presence of the proposition $\neg p$. Whatever the nature of the other discourse segments this proposition has no argumentative interest: either Jane speaks Portuguese or she doesn't but the fact that his husband doesn't is of no import in the job interview context.
The situation is a bit different in entailment-based cases. Example (20a), which corresponds to the discourse form of (18d) (*i.e.* $\neg p, \neg q$), is odd as we already mentioned but (20b) (of the form $\neg q, \neg p$ corresponding to the excluded (19d)) is acceptable. This is due do the fact that the entailment scale is here reversed[11] and thus that the first segment of (20b) implicates that John might come.

(20) a. It is not possible that John will come, and it's not sure.
b. It's not sure that John will come, and in fact it's not possible.

Sentence (18a) is as acceptable as any implicature cancelling discourse. There is a markedness which is quite strong in this particular example given the context: in a job interview one is expected to give the best answers possible, here the answer might sound unsure and therefore not to Jane's advantage.

Sentence (19a) is an interesting one. We ruled out the discourse form q, p when dealing with entailment-based scales. Here the discourse sounds perfectly fine, and this without any specific discourse relation marker. The second discourse segment is understood as a supplementary argument for Jane's skills in Portuguese. Since q doesn't entail p in this example the second segment is not redundant but offers new, potentially useful, information and hence is relevant.

3.2 Argumentative Configurations

We have distinguished between three argumentative configurations in the case of propositions related by a presumptive scale.

[11] Entailment scales of the form $\langle q, p\rangle$ have corresponding scales of the form $\langle \neg p, \neg q\rangle$ (in the usual fashion the strongest term is on the left of the scale). According to Ducrot's law of inversion this extends to any argumentative scale: $\langle q, p\rangle_H$ induces a scale $\langle \neg p, \neg q\rangle_{\neg H}$ even when q doesn't entail p.

The first configuration corresponds to the standard case already explained in Sect.15: an implicature with content $\neg q$ is expected to be derived from the utterance of p. We claim that these contexts correspond to the *upper-bounded* contexts described in (Breheny et al. 2005). We already encountered several examples of different configurations for this example. The reinforcement of the inference is preferred with a contrast of some sort, its cancellation demands a reformulative.

Situation (B) corresponds to cases like (12) for which the use of the strong scalar item would be counter-argumentative. A discourse of the form p, q therefore licenses a contrast. As we remarked in Sect.1.2 such contexts give rise to an interpretation that excludes q, the stronger scalar term. This is allowed by the previous formalizations even though the argumentative configuration is not the right one. Nevertheless, one has to consider that what the speaker asserts sets a lower-bound on the argumentative force of its assertion: he means to convey something at least as argumentatively strong as his utterance. Since in situation (B) and about example (12) the *all*-proposition is argumentatively inferior to the *some*-proposition, it doesn't belong to the speaker's commitment (in Merin's terms the *all*-proposition doesn't belong to the speaker's *upward relevance cone*). Exhaustivity excludes the *all*-reading as well for similar reasons. These observations could also apply to examples discussed by L. Horn (2005) and reproduced in (21). In this example the relevance of the *all*-sentence and the *some*-sentence are opposed as in (12).

(21) If some of my friends come to the party, Ill be happy, but if all of them do, Ill be in trouble.

These examples are discussed by Horn to underscore that the implicature from *some* to *some but not all* must be part of the semantic content of the first conditional for the sentence to be felicitous. He supposes that the quantifier gets reinterpreted once the second conjunct has been treated. The argumentative view is consistent with this by ruling out the *all*-interpretation from the speaker meaning due to the presence of an adversative. The second part of (12) could thus be treated as a way of *reformulating* the first part. Example (12), where semantic and argumentative information are clearly decoupled could be an interesting starting point in the examination of the nature of correction as compared to reformulation. Correction could be defined as implying a semantic contradiction from the speaker, something that doesn't occur here.

The last configuration in (C) needs some explaining. As it happens we can't manage to find proper examples or contexts to illustrate it in this case. A possible explanation would be the following:

- We already saw that some discourses (of form $\neg p, q$ or $q, \neg p$) are impossible because they're tantamount to contradiction (except under a metalinguistic negation reading)
- Discourses of the form q, p or $\neg p, \neg q$ were also excluded for reasons of irrelevant redundancy.
- This leaves two possible discourse forms

- Discourses such that the first item has a relevance to a particular proposition higher than the second (discourses p, q and $\neg q, \neg p$) whilst keeping the same sign. At this stage it's important to note that asserting p, the proposition with the weak lexical item and the strongest argumentative value, implies denying that q, the proposition with the strongest presumptive item, stands. As an example if *some* has more relevance than *all* (while *all* remains relevant to the same goal, only less so) then the utterance of a *some*-sentence implies that the quantifier is to be understood as *some but not all* for similar reasons as in situation (B). The only reason a speaker would have to assert the second segment of these discourses would be in the case he knew the first one (complete with restricted denotation) didn't stand. It might be that such discourses are possible, but we haven't found any example yet.
- Discourses such that the second conjunct is argumentatively opposed to and logically compatible with the first ($p, \neg q$ and $\neg q, p$). These would be discourses comparable to those obtained in (A) (*i.e.* utterances like *It's possible but not sure*). These are predicted to be possible and acceptable, but we have yet to find a context for which the situation is non-controversially the one in (C) and these examples are felicitous. This would enable us to observe some possible differences with the examples in situation (A).

3.3 Summary

Table (1) summarizes similar considerations about configurations (A) and (B). We ignore configuration (C) for the previously stated reasons. The first column of the table gives the form and order of the two discourse segments that are to be linked. The next two columns indicate if a discourse relation is preferably marked when the linking is possible (*ref.* for a reformulation, *cont.* for a contrast as conveyed by an adversative, $\emptyset$ for a neutral relation such as *elaboration*) or if the configuration is impossible (by marking an X).
The situation (A) column is intended to apply to any type of argumentatively ordered propositions, the (B) one only applies to propositions containing presumptive-scales items, as explained above.

3.4 On the Explicit Presence of Stronger Terms

We already remarked that items such as the restrictor *only* allowed some discourse forms that would otherwise be odd, for example as in (22).

(22) It's only possible and not sure.

The properties of *only* conventionally exclude a strongest proposition as shown by the impossibility of (23).

(23) # It's only possible and in fact sure.

Table 1. Discourse relations for linking related segments

	Discourse form	Situation A	Situation B	Remarks
(a)	p, $\neg q$	cont.	ref.	
(b)	p, q	ref.	cont. + ref.	
(c)	$\neg p$, $\neg q$	X	X	Redundant
(d)	$\neg p$, q	X	X	Contradictory (entailment case) or irrelevant
(e)	q, $\neg p$	X	X	Contradictory (entailment case) or irrelevant
(f)	q, p	$\emptyset$	X	Odd for entailment scales
(g)	$\neg q$, $\neg p$	ref.	cont. + ref.	
(h)	$\neg q$, p	cont.	ref.	

The negation of the strongest proposition is then redundant and its argumentative orientation is similar to the *only*-sentence. According to our previous claims about discourse structure (22) shouldn't be felicitous because the second conjunct is redundant without being argumentatively opposed to the first. Most speakers feel that (22) comes as a correction of a previous statement (*i.e.* one that asserts the certainty of the discussed event) and thus the second conjunct would be *echoic*, which would license its presence in (22). Another possibility is to assume that the the whole utterance (22) comes as an answer to a question such as *Is it sure?*, and that the second segment is the congruent answer to this question, expressed as a consequence, or result, of the first segment.

In the case of non-entailement based scales the results are the same: (24a) is good and (24b) isn't (when placed in the same context as (17)). The second segment of (24a) is more easily understood as linked by a consequence relation with the first.

(24) a. Only my husband speaks Portuguese, I don't
b. # Only my husband speaks Portuguese and in fact I also do.

According to our previous claims the use of an adversative to coordinate the previous sentences can't be automatically licensed. We don't claim that it's impossible, but rather that using it would convey more than the content of the two conjuncts (whereas in our core data the contribution of the adversative is less clear). The resulting sentences are hard to judge and almost impossible to find with simple searches on corpora. Examples are given in (25). We give french equivalents in (26) for which we have slightly more confident judgements.

(25) a. ? It's only possible, but not sure.
b. ? Only my husband speaks Portuguese, but I don't.
c. ? Only some students skipped class, but not all.

(26) a. ? C'est seulement possible, mais pas certain.
b. # Seul mon mari parle Portugais, mais pas moi.

c. ? Seuls quelques élèves ont séché les cours, mais pas tous.

Because we can't confidently judge those examples such data should be further investigated by experiment. At least in French, the examples including presumptive scalar terms ((26a) and (26c)) are preferred to those relying on purely contextual argumentative scales (as in (26b)). It might be that these particular uses of *but* are accepted out of habit due to the strong tendency to use it in the absence of *only* (as in our core data).

Similar considerations can be made about the item *at least*. Instead of restricting the denotation of a proposition, it widens it. The data in (27) (also shown in French in (28)) shows that, even though the usual presumptive implicatures aren't derived, the possibility to reinforce their putative content still demands an adversative connective.

(27) a. It's at least possible, but not sure.
b. ? At least my husband speaks Portuguese, but I don't.
c. At least some students skipped class, but not all.

(28) a. C'est au moins possible, mais pas certain.
b. ? Il y au moins mon mari qui parle Portugais, mais pas moi
c. Au moins quelques élèves ont séché les cours, mais pas tous.

To be entirely felicitous these examples need a third-party proposition to be construed in the argumentative scale which the two discourse segments belong to. For example in (27a) the relevant proposition would be along the lines of *It's probable*. If no obvious candidate is available, then the sentences are hard to interpret as in (27b). In that latter case if no salient person other than Jane and her husband is available then the answer doesn't make much sense. We expect that all observations we made about possible discourse structures remain valid with propositions including *at least*, under the assumption that there are two propositions argumentatively higher than the *at least*-proposition: one will be denied, the other is needed to interpret the sentence.

3.5 On the Colour of Flags

Example (29b) is often considered to mean (29c) by the derivation of a *Q*-implicature based on a *contrast set* (for details see for example (Levinson 2000)). This is an intriguing case because the argumentative relations at hand don't behave as in other cases.

(29) a. *A:* What's the colour of the flag?
b. *B:* The flag is red
c. +>There's no colour besides red on the flag / it's entirely red

The implicature is to be understood as meaning that the relevant colour for describing the flag is red. For example, if some person asks another to fetch a red flag from a stack of different countries' flags, the second person would likely fetch

a chinese flag (among others) but not a french one, even though none of them is completely red. Roughly, the implicature bears on the flag's background colour rather than its foreground one. If we look at the reinforcement and cancellation of this implicature the preferences for discourse relations don't match those in (8) (although it's easy to imagine contexts such that an adversative is felicitous) but are closer to the ones in (6): an adversative is preferred for the cancellation.

(30) a. The flag is red, (?but/and) there's no other colour on it / (# but/ and) entirely
b. The flag is red, but there are other colours on it / but not entirely

These examples are another argument against a treatment of the preference for a contrasted reinforcement of some inferences in terms of purely inferential mechanisms.
An exhaustivity account predicts the inference in (29b). It's less clear how a purely argumentative account could provide the desired inference from *red* to *entirely red* since its derivation appears independent from argumentative considerations. This argumentative neutrality is what prevents the systematic presence of an adversative in the first place; if predictible argumentative relations were in place we would observe an effect of the possible discourse relations to hold between the propositions.

3.6 *R-based* implicatures

Utterances contrasting the content of an *R-based* implicature with its mother-utterrance are odd (cf. (6)) and interpreting these utterances felicitously implies contexts such that the targeted implicature doesn't arise in the first place. For these particular inferences, it seems that we can argue for a systematic argumentative orientation regarding their mother-utterance.
Contrary to their *Q-based* counterparts, *R-based* implicatures lack a propositional content of their own (as noted for example in (Levinson 2000)). Expressing them linguistically amounts to explicitely expressing an enriched version of the mother-utterance. Thus expressing a contrast between an utterance B and the linguistic expression I of an hypothetical R-implicature attached to B means contrasting two identical propositions: if B indeed carries an implicature its full interpretation is I and B *but* I should be interpreted as I *but* I. The only way to "redeem" the sentence is to reject the implicature I associated with B and interpret B literally or with another implicature. As things stand, we consider that the argumentative behaviour of these inferences is the same as their moter-utterances.

4 The Source of the Preference

We gave arguments to explain why the examples we're interested in systematically license a contrast. We gave no arguments as to why this contrast is *preferred* when overtly marked.

4.1 Maximize Redundancy

A possibility we want to examine is the application of a principle close to Sauerland's *"Maximize Redundancy"*, as stated in (Sauerland 2008). This principle can be roughly paraphrased as urging a speaker to prefer, among a set of alternatives, a sentence that presupposes an already existing proposition over a sentence that presupposes nothing (with a pragmatic approach to presupposition as a proposition that is non-controversially part of all speakers' Common Ground). Thus, a speaker should prefer saying *the father of the victim* rather than *a father of the victim* because the former presupposes a non-controversial proposition. Uttering the latter would suggest that the presupposition doesn't obtain, contrary to common knowledge. Applied to our case, this means that, given two propositions p and q such that they always are argumentatively opposed, a speaker will prefer to utter p *but* q rather than p *and* q. The second one would suggest that a contrast doesn't hold between p and q and thus contradict the argumentative configuration, or at least make the speaker sound "dissonant". At this stage we need to further back up this claim on at least two counts:

1. by ensuring that the non-felicitousness of (4e) is related to, and of the same order as, that of utterances such as *"a father of the victim"* usually treated in works about the discussed principle
2. by ensuring that the predictions made by the Maximization principle apply to the cases we study; the notion of presupposition used by Sauerland is technical and doesn't necessarily apply to the contrast conveyed by the use of *but* (*i.e.* what is often called a conventional implicature rather than a presupposition)

4.2 Properties of Contrast

An alternative explanation for the preference for a marked contrast would be to consider this preference as an idiosyncratic property of the relation at hand. This would be in line with the approach of Asher and Lascarides (2003), where it is claimed that the semantics of the relation of *Contrast* (as defined in *SDRT*) are such that the relation requires a specific clue to be used, either an overt cue element such as *but* or intonation alone. Therefore the preference we observe for contrast would be a consequence of the particular semantics of the relation of *Contrast*. For example the first and second segment of (31) are opposed: that John doesn't like hockey is a default consequence of the first segment; since this relation of opposition is already present it needs to be overtly marked.

(31) John hates sports, but he likes hockey.

However the argumentative relations between propositions aren't always obvious. An example such as (21) is a good illustration: if one doesn't know, among other possible reasons, whether the speaker has a great or small appartment one can't decide whether it would be a good or a bad thing for the speaker to have all its friend coming to his party. In that case when the speaker uses an

adversative the quantifiers are reinterpred in the way suggested in (Horn 2005). If it is evident that the speaker can't accommodate all his friends then the need for reinterpretation is less evident; it's rather the presence of an adversative that is forced to the speaker because of an opposition that is already present. This amounts to say that the presence of an explicit *Contrast* marker has two possible sources: either the speaker wishes to coordinate two propositions that stand in a systematic argumentative opposition (our core data and (31)) or he wishes to convey that a non-obvious opposition holds between the two ((21) and others such as *She's poor but honest*). If the processing of a discourse is seen as an unification process, the exact source for the choice of the adversative doesn't matter; what matters is that the requirements of the connective match the argumentative properties of the propositions it connects and vice-versa. In the case their relation aren't evident, they should be imagined as being underspecified and specified by the adversative.

A last set of fact we'd like to take into account is related to other cases of systematic argumentative opposition. We already remarked that an utterance of the form *almost p* was argumentatively opposed to $\neg p$, the same way our core data implicatures are with their base-utterances. What we observe is that an utterance of the form *almost p,* $\neg p$ is acceptable with and without contrast, as exemplified in (32) (which corresponds to (32) without the adversative).

(32) Mary almost fell, she caught herself.

There is a slight difference in interpretation between the *but* and *but-less* versions, pertaining to the discourse relation that connects the two parts of the discourse. While in the former case a contrast is conveyed, in the latter it's an *explanation* (a relation compatible with the null discourse connective). In this case an argumentative opposition still exists between the two parts (due to the argumentative properties of *almost*) but the speaker seems to favour another relation and uses a connective incompatible with the expression of argumentative opposition. The statistics given on the RST website[12] show that the proportions of signaled relations in texts amount to only 30%, meaning that most relations aren't explicitely marked in discourse. This could be another argument for the idiosyncratic treatment of the contrast relation and its markers.

5 Conclusion

We observed what seemed to be a constraint on the felicitous reinforcement of some implicatures. We took an argumentative approach and showed that the standard accounts of adversatives and implicatures in this approach worked together to legitimate the use of adversatives to reinforce some implicatures on the basis of the argumentative properties of the propositions they express. In a more general way we predicted possible discourse structures from the argumentative relations between propositions depending on the context of utterance.

[12] http://www.sfu.ca/rst/02analyses/index.html

We still have to give a definitive explanation for the preference for contrast. We gave two possible reasons for it, and we intend to study this in our future research with an experimental approach. The results of these experiments could provide support for the argumentative approach to semantics and pragmatics we presented, and thus to our explanation of the main, non-trivial, fact we began with: an utterance can convey an implicature and yet be argumentatively opposed to it.

References

J.-C. Anscombre & O. Ducrot (1977). 'Deux mais en français'. *Lingua* **43**:23–40.

J.-C. Anscombre & O. Ducrot (1983). *L'argumentation dans la langue*. Pierre Mardaga, Liège:Bruxelles.

N. Asher & A. Lascarides (2003). *Logics of Conversation*. Cambridge: Cambridge University Press.

B. Benndorf & J.-P. Koenig (1998). 'Meaning and context : German aber and sondern'. In J.-P. Koenig (ed.), *Discourse and cognition : bridging the gap*, pp. 365–386. CSLI Publications, Stanford.

R. Breheny, et al. (2005). 'Are Generalised Scalar Implicatures Generated by Default? An on-line investigation into the role of context in generating pragmatic inferences'. *Cognition* .

R. Carston (1998). 'Informativeness, Relevance and Scalar Implicature'. In R. Carston & S. Uchida (eds.), *Relevance theory: Applications and Implications*. John Benjamins.

R. Carston (2005). 'Relevance Theory and the Saying/Implicating distinction'. In L. Horn & G. Ward (eds.), *The handbook of Pragmatics*. Blackwell.

O. Ducrot (1980). *Les échelles argumentatives*. Les Éditions de Minuit.

G. Gazdar (1979). *Pragmatics: Implicature, Presupposition and Logical Form*. New York : Academic Press.

H.P. Grice(1989). *Studies in the way of words*. Harvard University Press.

J. Jayez & L. Tovena (2008). 'Presque and almost: how argumentation derives from comparative meaning'. In O. Bonami & P. Cabredo Hofherr (eds.), *Empirical Issues in Syntax and Semantics*. vol. 7, pp. 1–23.

J. Hirschberg (1985). *A theory of scalar implicature*. Ph.D. thesis, University of Pennsylvania.

L. Horn (1989). *A natural history of negation*. The University of Chicago Press.

L. Horn (1991). 'Given as new: when redundant information isnt'. *Journal of Pragmatics* **15**(4):313–336.

L. Horn (2005). 'The border wars: a neo-gricean perspective'. In Turner et al. (eds.), *Where Semantics Meets Pragmatics*, pp. 21-48. Elsevier.

S. C. Levinson (2000). *Presumptive Meanings: The Theory of Generalized Conversational Implicature*. MIT Press, Cambridge, MA, USA.

A. Merin (1999). 'Information, Relevance and Social Decision-Making'. In L. Moss, J. Ginzburg, & M. de Rijke (eds.), *Logic, Language, and computation*, vol. 2, pp. 179–221. CSLI Publications, Stanford:CA.

I. Noveck & D. Sperber (2007). 'The why and how of experimental pragmatics: The case of 'scalar inferences''. In N. Burton-Roberts (ed.), *Advances in Pragmatics*. Palgrave Macmillan, Basingstoke.

U. Sauerland (2008). 'Implicated Presuppositions'. In A. Steube (ed.), *Sentence and Context. Language, Context & Cognition*, Mouton de Gruyter, Berlin, Germany. (to appear)

R. van Rooij (2004). 'Cooperative versus argumentative communication'. *Philosophia Scientia* **2**:195-209.

R. van Rooij & K. Schulz (2004). 'Exhaustive interpretation of complex sentences'. *Journal of Logic, Language and Information* **13**:491-519.

D. Wilson & D. Sperber (2005). 'Relevance Theory'. In L. Horn & G. Ward (eds.), *The handbook of pragmatics*. Blackwell.