Buoyancy and strength*

Bart Geurts

Humboldt University, Berlin
&
University of Nijmegen

Abstract

The chief characteristic of presuppositions is that they tend to take wide scope, yet most theories of presupposition, the author's not excepted, fail to provide an explanation of this fact. Recently, however, it has been suggested that a principled explanation can be given in terms of informativeness: the idea is that presuppositions simply prefer stronger readings to weaker ones. This proposal is studied in some depth, and is shown to lack solid empirical evidence. Furthermore, it is argued that assuming a preference for strong readings is either ad hoc, when restricted to presuppositions, or just false, when held to apply more widely. The paper leaves the main problem very much where it is, though some suggestions are made as to how the situation might be improved.

Anaphoric pronouns may be used to refer back to an object introduced in the preceding discourse, but also to refer forward to an object yet to be introduced (the latter usage is sometimes called 'kataphora' or even 'cataphora'). This may be so, but a theory of anaphora that predicts only this much is seriously incomplete, because it doesn't account for the fact that forward reference is the exception and backward reference the rule. A theory that doesn't explain this preference isn't much of a theory at all. Most of the phenomena a theory of interpretation has to deal with are like this. It would be very nice if we had theory that predicted all and only possible interpretations for any expression in any context; but it would hardly count as a full-fledged theory of interpretation. Small wonder, therefore, that the framework of optimality theory naturally suggests itself for dealing with a wide range of problems in semantics and

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pragmatics. One of the problems that immediately comes to mind is that of presupposition projection, not only because projection phenomena seem to spring from the interaction between several forces of varying strength, but also because that is precisely how many theories of presupposition treat their subject matter.

Optimality-theoretic treatments of presupposition have been proposed by Zeevat (1999) and Blutner (this volume), and in the following I will assume that some account along these lines is the right one. What I will be worrying about is one of the constraints postulated by Blutner and Zeevat. Thus I will follow the lead of Haspelmath (2000), who argues that optimality-theoretic analyses are often incomplete, because they fail to motivate their constraints. Haspelmath restricts his discussion to phonology and syntax, where it is still possible to just postulate a set of constraints, and get away with it, but people working in semantics and pragmatics (especially pragmatics) tend to be less accommodating, as will be demonstrated in the following.

Speaking loosely, presuppositions are interpretative elements that seek to have wide scope. This is but a loose way of speaking because presupposition projection is a pragmatic phenomenon, which has little to do with scope taking in the grammarians' sense of the word, but it serves well enough as a rough and ready characterization of what the projection problem is about. A more accurate, though less straightforward, description is the following: if a presupposition ϕ is triggered within the syntactic scope of any expression α, it will typically though not invariably seem as if ϕ isn't affected by the presence of α, at all. To illustrate, if someone utters (1a), he will generally be understood as implying that (1b) is true, which is to say that the presupposition triggered by the factive verb (that the dean is a woman) appears to ignore the presence of the modal expression and the negative.

(1) a. Perhaps Fred doesn't know that the dean is a woman.
b. The dean is a woman.

Why is it that presuppositions tend to take wide scope? The sad answer is that, at present, we don't know. I am not aware of any theory of presupposition projection that has a fully explanatory account of why presuppositions behave the way they do. Projection theories appear to fall into two classes: they either don't work or else they are forced to postulate, under some guise or other, that presuppositions tend to take wide scope. This may seem like a hopelessly embarrassing situation, but it isn't: it is embarrassing, but not hopeless. For it can hardly be doubted that the *workings* of presupposition projection are better understood now than they ever were. There is a broad consensus about the mechanics of presupposition projection, and most people working in the field would agree, I believe, that the outlines of a solution to the projection problem

have become reasonably clear. Yet the Big Why question still remains, and in the following pages I will first explain how it continues to haunt modern-day attempts at dealing with presupposition projection, and then consider at some depth an answer that has been suggested recently.

Let us start out from one of the landmarks in the literature. Heim's 1983 paper is an attempt to show that 'presupposition projection is an epiphenomenon of the laws governing context change […].' (p. 116)[1] Heim presents a dynamic semantics which defines the meaning of an expression in terms of the effects it has on the context in which it is being used. Presuppositions, on Heim's account, are definedness conditions. If a sentence contains an expression or construction triggering a presupposition ϕ, then the utterance is not felicitous unless ϕ is already given. To make this a bit more precise, consider a simple propositional language consisting of atomic sentences, negated sentences, and sentences of the form $\phi\{\psi\}$, which is to be read as 'ϕ contains an expression or construction that triggers the presupposition that ψ is given.' Assuming that a context can be modeled by a set of possible worlds, the following is a Heimian context-change semantics for our miniature language:

(2) a. $c+\phi = \{w \quad c \mid \phi \text{ holds in } w\}$, if ϕ is an atomic sentence
b. $c+(\neg\phi) = c - (c+\phi)$
c. $c+\phi\{\psi\} = c+\phi$, if $c+\psi = c$; otherwise $c+\phi\{\psi\}$ is undefined

This semantics predicts, for example, that $\neg\phi\{\psi\}$ is undefined in a context in which ψ is not given. Thus, the following will be infelicitous unless it is assumed that France has a king:

(3) I didn't have breakfast with the king of France this morning.

Of course, it would be patently unrealistic to claim that this sentence simply cannot be felicitously uttered unless it is given beforehand that France has a king.[2] The statement in (3) may also be used to convey, by way of presupposition, that France has a king. If a presupposition-inducing expression is thus exploited, in a context in which its presupposition is not given, the presupposition is accommodated: it is added to the context before the

[1] Although Heim uses these words to characterize the motivation behind Gazdar's work, it is evident that, in the paper under discussion, she makes his aim her own.

[2] This is reminiscent of Strawson's account of presupposition failure, but the parallel is imperfect, because Strawson actually maintained that, in this type of case, the presupposition is actually suppressed (Strawson 1964).

interpretation process goes on.[3] However, as Heim points out, in a dynamic semantics there may be several contexts in which a presupposition can be accommodated. (3) is a case in point. This sentence is of the form $\neg\phi\{\psi\}$ and if it is used in a context c, we get the following: $c+(\neg\phi\{\psi\}) = c - (c+\phi\{\psi\})$. In this situation, ψ may be accommodated in c; that is to say, ψ may be added to c *as if* it had been asserted in the foregoing. In this case ψ is accommodated *globally*. But it is also possible to only temporarily accommodate ψ in c to allow for the intermediate evaluation of $c+\phi\{\psi\}$. In this case ψ is accommodated *locally*: ψ is added to a copy of c, so to speak, and the main context itself remains untouched. If (3) is interpreted this way, it is understood as saying merely that it is not the case that there is a king of France whom the speaker had breakfast with. This is a marked reading, to be sure, but it is one way to construe the sentence. The default interpretation, which does imply that France has a king, is achieved when we resort to global instead of local accommodation.

It is plain that, without further provisions, the distinction between global and local accommodation would give rise to the prediction that presuppositional expressions cause systematic ambiguities, a prediction that is not borne out by the data. What we want to account for is the fact that, normally speaking, (3) will be heard as implying that there is a king of France, and that situations in which this implication is suppressed are the exception rather than the rule. Heim proposes to deal with this matter by stipulating that global accommodation is preferred to local accommodation, but concedes that she can't explain why this preference should exist. And in the absence of such an explanation we lack a full-fledged account of why presuppositions tend to take wide scope.

The same problem besets more recent treatments of presupposition projection. Van der Sandt (1992) proposes that presuppositions are (presented as) given in essentially the same sense in which the antecedents of anaphoric pronouns are given. On van der Sandt's account, the definite NP in (3) signals that the king of France is contextually given, and if he is, the discourse referent associated with *the king of France* is immediately identified with its antecedent. If he isn't, a suitable antecedent is accommodated, which brings us back to the problem discussed in the last paragraph. Van der Sandt solves this problem by adopting Heim's preference rule while at the same time generalizing it. Working within the framework of discourse representation theory (Kamp 1981, Kamp and Reyle 1993), he stipulates that, if a presupposition cannot be bound to a suitable antecedent, it will be accommodated as closely as possible to the top level of the discourse representation. This formulation yields the same

[3] The term 'accommodation' is due to Lewis (1979); the notion itself is already present in Grice's and Stalnaker's work of the early seventies; cf. Stalnaker (1974) and Grice (1981) (which is based on a lecture given in 1970).

predictions for example (3) as does Heim's, but van der Sandt's version also allows for the possibility of intermediate accommodation, i.e. accommodation in a DRS situated on the path connecting the main DRS to the DRS in which the presupposition was triggered. This is what typically happens in cases like the following:

(4) a. Most teachers spoil their children.
b. Most teachers who have children spoil them.
c. Most teachers have children and spoil them.

The preferred reading of (4a) is (4b) not (4c). This is explained as follows. The definite NP *their children* contains a pronoun bound by the quantifier *most teachers* (this construal isn't mandatory, of course, but the possibility of sentence-external anaphora is irrelevant to our present purposes). Therefore the DRS initially associated with (4a) is (5a):

(5) a. [: [u: Tu] most u [v: Cvu, Suv]]
b. [: [u, v: Tu, Cvu] most u [: Suv]]

Key: T*x*: *x* is an teacher; C*xy*: *x* are *y*'s children; S*xy*: *x* spoils *y*

In (5a) the presupposition triggered by *their children* in (4a) is highlighted by underscores. This presupposition cannot be bound and will therefore have to be accommodated, and since accommodation in the main DRS is not possible (because this would 'unbind' the discourse referent u), van der Sandt's rule predicts that accommodation in the quantifier's restrictor is the next-preferred option. This yields (5b), which is indeed the most prominent reading of (4a).

While van der Sandt's accommodation rule is arguably an improvement on Heim's, it gives rise to the same problem. If it is true that presuppositions must be accommodated as closely as possible to the main DRS, there should be a reason for this. But van der Sandt doesn't explain why this preference holds.

In my own work on presupposition projection I have argued that van der Sandt's rule should apply not only to accommodation but to presuppositions across the board (Geurts 1999a), and in Geurts (1999b) I have proposed an even more general principle, which holds for specific indefinites as well as presuppositions. According to this Buoyancy Principle, as I have dubbed it, all *backgrounded* material tends to float up to the main DRS. Since presuppositions are always backgrounded, this doesn't make a predictive difference as far as presuppositions are concerned. But the Buoyancy Principle applies to specific NPs, too, and thus serves to explain, for example, how the indefinite NP *a colleague of mine* in (6) manages to obtain 'wide scope':

(6) At least three students reported they had witnessed a colleague of mine intone 'All you need is love'.

Although the Buoyancy Principle is more general than van der Sandt's accommodation principle, which in its turn is more general than Heim's, the three accounts are in the same predicament, for none of them offers an explanation of why their respective principles should hold.[4]

Recently, it has been suggested by several, partly independent, sources that the reason why presuppositions tend to float up is that the resulting readings tend to be stronger than their competitors (Yeom 1998, Zeevat 1999, Blutner, this volume). Restricting our attention to the accommodation cases, which are by far the most urgent, the basic idea underlying these various proposals is the following. If a presupposition ϕ must be accommodated and ϕ can be accommodated at positions K_1, …, K_n and accommodation at K_i yields a reading that is stronger (more informative) than all others, then accommodation at K_i is the preferred option. If, for some reason or other, accommodation at K_i is out of the question, the next strongest reading is preferred, and if two accommodation sites K_i and K_j result in equally informative readings, no preference for either K_i and K_j is predicted. (Which is not to say that it is predicted that there is no preference for one as opposed to the other, but merely that such preferences as there are must be attributed to other factors, such as world knowledge, contextual information, and so on.)

In the following it will be convenient to have a label for referring to this type of account. Let us say, therefore, that any theory that analyses presupposition projection along these lines adopts the Informativeness Principle, which says that more informative readings are preferred, *ceteris paribus*, to less informative ones. The main objective of this paper is to compare the Informativeness Principle (IP), thus understood, with the Buoyancy Principle (BP), and argue that there are no good reasons for believing that the latter should give way to the former. The evidence that I will be adducing is mainly circumstantial, for it will be shown that, although the BP and IP yield diverging predictions in some cases, the empirical differences between them are

[4] The focus of this paper is on one particular constraint on presupposition projection, which might give the impression that my account is closer to some of the famous theories of the seventies than it actually is (e.g. Karttunen 1973, Gazdar 1979, Karttunen and Peters 1979). In particular, I should like to stress that buoyancy is not the key notion in my theory; it is merely one of several constraints on presupposition projection. Moreover, I assume, following Heim and van der Sandt, that projection is part of a dynamic process of discourse interpretation, in the sense of Kamp (1981) and Heim (1982). In other words, I presuppose a general framework that wasn't available in the seventies. Needless to say, this makes it difficult to compare this style of account with the ones proposed by Gazdar, Karttunen, and Peters.

a lot smaller than one might expect. The main attraction of the IP is that it promises a more principled treatment of presupposition projection than the BP can offer, and it is precisely this point that I have my doubts about.

In the remainder of this paper I will confine my attention to cases of accommodation, and although I will continue to refer to the Buoyancy Principle, the differences between van der Sandt's views and my own don't affect any of the points I have to make. For the purposes of the following discussion, relative strength (or, equivalently, informativeness) will be equated with unilateral entailment. More accurately: ϕ is stronger than ψ iff ϕ entails but is not entailed by ψ. I will assume that the strength of an expression (on a given reading) is gauged by its full communicative content; hence strength not only takes into account literal meaning (whatever that may be), but also presuppositions, implicatures, and so on.

Before I begin to tease out the differences between the IP and the BP, I should like to stress that they are very much alike with respect to the way they are to function within a theory of presupposition. Most importantly, both principles are 'soft' constraints, which only apply *ceteris paribus*. If a given reading is unacceptable for pragmatic reasons, for example because it is contradictory or just implausible, the IP and the BP only differ about how the next best reading is determined, and therefore the choice between the IP and the BP has no bearing on Blutner's and Zeevat's claim that presupposition projection should be treated within the framework of optimality theory.

Largely for accidental reasons, the empirical differences between the BP and the IP aren't as pronounced as one might think. To explain this, let us begin with presuppositions triggered within the scope of a negative expression, such as (3), for example. Adopting the DRT framework, and assuming that the current discourse representation lacks an entry for the king of France, this sentence gives rise to two possible readings:

(7) a. [u: Ku, ¬[: Bu]]
b. [: ¬[u: Ku, Bu]]

Key: K*x*: *x* is the king of France; B*x*: the speaker had breakfast with *x* this morning

According to the first reading, there is a king of France, whilst according to the second, there need not be such a man. Since neither reading is stronger than the other, the IP doesn't predict a preference for either. But as in (7a) the presupposition is accommodated in a higher position than in (7b), the BP predicts that the former reading is preferred, which is correct. We should not conclude from this, however, that in this particular case the BP gets the facts right while the IP does not, for it may be argued that a more refined treatment

of presuppositions will make the two readings commensurable, after all. Suppose that the definite article carries a uniqueness implication; that is to say, *the king of France* implies that there is one and only one king of France. Then (7a, b) give way to (8a, b), respectively, where ιKFu abbreviates 'Ku, [v: KFv] [: v = u]':

(8) a. [u: ιKu, ¬[: Bu]]
b. [: ¬[ιKu, Bu]]

Now the first reading is stronger than the second, and the IP makes the same prediction as the BP. Note that it is irrelevant to this point how the uniqueness implication arises; we only need to assume *that* it does.

Naturally, it may be doubted that definite descriptions imply uniqueness, but there is no consensus in this matter as far as I know (although it is generally accepted that definite descriptions don't imply uniqueness in the same way as they imply existence). Nor is there agreement on whether presuppositions in general carry uniqueness implications or not, simply because this issue has not been addressed in the literature. But I don't see why someone who insists that definite descriptions imply uniqueness couldn't consistently extend his claim to presuppositions in general.[5] So the upshot of the foregoing observations is that negated sentences will not help us arbitrate between the BP and the IP, although *prima facie* it seemed likely that they would. And this is a pattern that repeats itself with other scope-bearing expressions, as we will presently see.

Consider modal contexts, for example:

(9) Perhaps I'll have lunch with the king of France today.

This sentence has two readings, depending on whether the king of France is accommodated inside or outside the scope of the modal operator:

(10) a. [u: Ku, ◊[: Lu]]
b. [: ◊[u: Ku, Lu]]

Key: K*x*: *x* is the king of France; L*x*: the speaker will have lunch with *x* today

[5] The idea that factive verbs like *know* and *regret* or transition verbs like *begin* and *stop* have uniqueness presuppositions may not strike one as manifestly true, but it is less weird than it seems. For instance, if 'Fred knows that 1 + 1 = 2' presupposes that 1 + 1 = 2, the uniqueness presupposition would be that there is only one proposition to the effect that 1 + 1 = 2, which is correct, I take it (and not just because this happens to be a mathematical truth).

Again, the first reading is preferred, and the BP predicts this without further ado,[6] while the IP does not: if we feed (10a, b) into a run-of-the-mill semantics for modal logic, neither will be stronger than the other, so the IP will not decide between these two interpretations. If, however, a less standard but arguably more realistic semantics is adopted, the IP may be brought back in line with the BP. For example, if (10a) is interpreted along the lines suggested by Stalnaker (1968) and Lewis (1973), then we obtain a construal that may be paraphrased as follows: 'There is a king of France, call him *a*, and there is at least one world which is maximally similar to the actual world and in which the speaker will have lunch with *a* today.' But if *a* is the king of France in the actual world, and a given world *w* is maximally similar to the actual world, then presumably *a* will be king of France in *w*, also. On such an account of modality, (10a) will be synonymous with:

(11) [u: Ku, ◊[u: Ku, Lu]]

This *is* stronger than (10b), of course, and now the predictions made by the IP and the BP coincide.

If modal sentences don't differentiate between the IP and the BP, one might hope that attitude reports will. But, surprisingly perhaps, they won't.

(12) Fred believes that I will have dinner with the king of France tomorrow.

Suppose again that this is uttered in a context in which it is not yet settled if France has a king. Then this sentence may be construed as (13a), which entails that there is a French king, or as (13b), which lacks this entailment.

(13) a. [u: Ku, Bel_F[: Du]]
b. [: Bel_F[u: Ku, Du]]

Key: K*x*: *x* is the king of France; D*x*: the speaker will have dinner with *x* tomorrow; $Bel_F\phi$: Fred believes that ϕ

These readings are clearly distinct, and in this case it seems quite unlikely that a realistic semantics will allow us to maintain that either one is stronger than the other. That being so, the BP and the IP make different predictions: according to the BP, (13a) is preferred, while the IP doesn't predict a preference for one or

[6] Well, almost: it must be assumed that the main DRS in (10a, b) is accessible from the embedded DRS. I will suppose without further argument that this is the case, and that the same holds for modal contexts in general, as well as for attitude reports (to be discussed below). See Geurts (1999a) for extensive discussion of this matter.

the other. Which prediction is the correct one? In my opinion, the first prediction is better than the second, because (12) does seem to imply, all things being equal, that France has a king.[7] But there is a snag: (12) *also* seems to imply, all things being equal, that Fred believes that France has a king. That is to say, the normal way of reading *the king of France* in (12) is, in a sense, *de re* and *de dicto* at the same time, and may be represented as follows:

(14) [u: Ku, Bel_F[u: Ku, Du]]

There is little agreement in the literature on how this type of reading may be accounted for. Zeevat (1992) defines his projection mechanism in such a way that it directly produces structures like this. Heim (1992) outlines a theory of presupposition projection which yields (13b), and suggests that this reading is eked out on the basis of pragmatic inferences, so as to obtain (14). Finally, the theory presented in Geurts (1999a) is the mirror image of Heim's: my projection mechanism yields (13a) by default, courtesy of the BP, and this is elaborated on by pragmatic reasoning, the outcome of which is (14). Without delving into the details of this discussion, it will by now be clear where the problem lies: if (14) is the preferred reading of (12), and this example is representative of the interplay between presuppositions and attitude reports, then attitude reports don't drive an observational wedge between the BP and the IP, either.

Blutner (this volume) discusses a class of data for which the BP and the IP yield clearly distinct predictions. These are sentences in which a presupposition ϕ is triggered within the scope of a quantifying expression Q and ϕ contains a discourse referent bound by Q. If we adopt the BP, the DRT account of presupposition projection predicts that in such an event global accommodation is excluded (because the resulting DRS would not be a proper one), so on the preferred reading ϕ restricts Q's domain. The following is a case in point:

(15) All customers of the Lone Star saloon have to part with their guns at the entrance.

[7] Intuitions about presuppositions triggered in attitude contexts are a delicate business, because they are unusually sensitive to background knowledge, for obvious reasons: if (12) is uttered in a context in which it is taken for granted that France is a republic, it is entirely natural to attribute the presupposed content to Fred, by way of local accommodation. Readers who disagree with the author's judgment about (12) are therefore advised to replace *the king of France* with a less obvious instance of presupposition failure, like *my lawyer*. For further discussion of the empirical problems besetting presuppositions in attitude contexts, see Geurts (1999a: 133-140)

This will ordinarily be interpreted as saying that all customers who have a gun are required to leave it at the entrance. On this reading, the occasional cowboy or Indian who doesn't have a gun and enters the Lone Star saloon does not falsify the statement in (15).

(16) a. [: [x: Cx] all x [u, v: Gvu, Lxv]]
b. [: [x, u: u = x, Cx] all x [u, v: Gvu, Lxv]]
c. [: [x: Cx] all x [v: Gvx, Lxv]]
d. [: [x, v: Cx, Gvx] all x [: Lxv]]

Key: C*x*: *x* is a customer at the Lone Star saloon; G*xy*: *x* is *y*'s gun; L*xy*: *x* has to part with *y* at the entrance

(16a) is the semantic representation of (15) in which only two presuppositions remain to be processed: the definite NP *their guns* triggers the two-part presupposition that (i) there is an individual u such that (ii) v is u's gun. The first presupposition is bound to the discourse referent x in the domain of the quantifier, as shown in (16b), which is equivalent to (16c). The second presupposition cannot be bound and must therefore be accommodated. Accommodation in the main DRS is not possible because this presupposition contains a discourse referent, i.e. x, which is introduced in the domain of the quantifier, hence the BP predicts that accommodation in the restrictor is the next-preferred option, and we obtain the DRS in (16d), which is the reading we wanted to account for.

If we adopt the BP, we predict that whenever (i) a presupposition χ is triggered in the second half of a structure of the form 'ϕ Q *u* ψ, and (ii) χ contains the discourse referent *u*, then there will be a preference for accommodating χ in ϕ. If we adopt the IP, on the other hand, we obtain different predictions when Q is a universal quantifier, for example. If a presupposition arises on the right-hand side of *all* or *every*, the prediction is that it will preferably be accommodated in the quantifier's nuclear scope, because this reading is stronger than the one predicted by the BP. Thus (15) is predicted to imply that all customers of the Lone Star saloon have guns (not to complicate matters even further I ignore the modal here). This prediction, it seems to me, is plainly incorrect.

A particularly common subtype of the phenomenon illustrated in (15) is exemplified by the following:

(17) Wilma always drinks [gin and tonic]$_F$.

With focus on the object NP, this is more or less synonymous with 'Whenever Wilma drinks anything, it is gin and tonic', which is precisely the reading

predicted by the BP if it is assumed that non-focused information is presupposed (see Geurts and van der Sandt 1999 for discussion). So the BP offers a rather neat account of the various ways in which information appearing in the nuclear scope of a quantifier may end up restricting the quantifier's domain, an account that will have to be forsaken if we supplant the BP with the IP.

The IP has two related but distinct problems with quantified sentences such as (15) and (17). First, it sometimes makes incorrect predictions, as we have just seen. Secondly, the IP wrongly predicts that the preferred interpretations of these sentences will vary with the choice of quantifier. For example, whereas in a sentence with a universal quantifier there should be a preference for accommodation in the nuclear scope, in a sentence with *most* there shouldn't be any preference, as far as the IP is concerned, because accommodation in the nuclear scope does not yield a reading that is stronger than accommodation in the quantifier's domain, or *vice versa*. Therefore (18a) should have two equally likely readings, viz. (18b) and (18c) ((18) = (4)).

(18) a. Most teachers spoil their children.
b. Most teachers who have children spoil them.
c. Most teachers have children and spoil them.

This prediction is incorrect, too, because the choice of quantifier doesn't seem to affect our preferences for local as opposed to intermediate accommodation.

In my opinion, this evidence clearly speaks in favour of the BP and against the IP. But I must concede that this argument is not quite as powerful as it may appear to be at first, because speakers' intuitions about the data are sometimes a bit fuzzy around the edges, and in some cases speakers *seem* to favour readings that are stronger than the BP would lead us to expect (cf. Beaver 1994). Note, for example, that the statement in (15) would be somewhat odd if it were part of the common ground that it is unusual for the Lone Star's clientele to carry weaponry of any sort. Observations like this have been taken to suggest that (15) conveys that a majority of the saloon's customers have guns, which is not unlike the reading Blutner derives by means of his version of the IP. Nevertheless, it bears emphasizing that Blutner's prediction is still stronger than what is intuitively perceived, and his predictions concerning sentences with *most* aren't borne out by the empirical facts, at all. Furthermore, Geurts and van der Sandt (1999) have tried to show how the quasi-universal inferences

associated with some instances of domain restriction can be accounted for without repudiating the BP.[8]

The moral of the foregoing discussion is the following. Judging only from what the BP and the IP say, one should expect the two principles to have clearly distinct observational consequences. It turns out that this is not the case: there are very few data that straightforwardly falsify one principle while corroborating the other. The only data that make a clear distinction are related to domain restriction, and although I should say that these facts suggest rather strongly that the BP outperforms the IP, the evidence is weakened somewhat by the considerations adduced in the last paragraph.

If we consider supplanting the BP with the IP we shouldn't hope for any predictive gains; empirical adequacy is not at issue. What is at issue, I take it, is the notion that the IP offers a principled alternative to what is little more than a stipulated rule. Saying that stronger readings are preferred to weaker ones certainly seems less *ad hoc* than saying that presuppositions want to float up to the main DRS. However, this impression is quite misleading. True, the BP cries out for some sort of justification. But the same holds for the IP, too. Why should hearers prefer strong interpretations over weaker ones? Isn't that an extremely risky processing strategy? Wouldn't it be wiser to opt for the weakest reading, *ceteris paribus*? It surely would be the safest strategy, and it has been suggested more than once that people actually adopt it, too (e.g., Crain and Steedman 1985).[9]

Blutner (this volume) implements his version of the IP in an optimality-theoretic reconstruction of a neo-Gricean model of interpretation. More succinctly, he sees the IP as a special case of Grice's first quantity maxim. It should be noted, however, that the maxim's *raison d'être* is lost in Blutner's reconstruction. Grice's quantity maxim exhorts the speaker to make his contribution 'as informative *as is required for the current purposes of the exchange*' (Grice 1989: 26; emphasis added). This is eminently reasonable, of course, and

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[8] This paragraph may strike some readers as less than fully transparent, but the issue is rather intricate, both observationally and conceptually, and has been discussed at length elsewhere (Geurts and van der Sandt 1999).

[9] One of the referees for this journal notes that, in an optimality-theoretic framework, the IP might coexist with a constraint that selected the weakest reading. Technically speaking, this is correct, but apart from that this suggestion causes more problems than it solves. I take it that, whether or not we operate in an an optimality-theoretic framework, the constraints we introduce call for some sort of justification. Constraints don't come for free; they must be motivated. My concern here is with the justification of one particular constraint, viz. the IP, and adding a further constraint will not solve this problem. What is more, it will immediately raise the rather hairy question how we could motivate a pair of constraints that flatly contradict each other.

not in need of further justification. But it is obviously not the same as demanding that an utterance be as informative as possible.

Thus far I have pretended as if the IP were a general principle which applies not only to presupposition projection but across the board. If this turned out not to be the case, that is to say if the IP held only in some cases but not in others, the explanatory merit of the IP would dwindle even further. Unfortunately, I see little reason to believe that the IP is a general principle of interpretation. The following examples all have two readings, where one (i) entails the other (ii):[10]

autohyponyms:

(19) Fred picked a fight with a Yankee.
  i. Fred picked a fight with an inhabitant of the Northern States of the US.
  ii. Fred picked a fight with an inhabitant of the US.

syntactic ambiguity:

(20) a. Barney's social circle consists of inarticulate philosophers and literary critics.
  i. inarticulate [philosophers and literary critics]
  ii. [inarticulate philosophers] and [literary critics]
  b. The cover of Betty's latest novel is decorated with pink fruits and vegetables.
  i. pink [fruits and vegetables]
  ii.[pink fruits] and vegetables

scope ambiguity:

(21) Everybody in this room speaks two Romance languages.
  i. Two Romance languages are spoken by everybody in this room.
  ii. Everybody in this room speaks two Romance languages

If the IP were a general principle of interpretation, we would predict that the i-readings are always preferred to the ii-readings, which is surely incorrect. There may be some room for dispute in one or two cases, but the least one can say that there is no strong preference for either reading in most cases, and especially when we compare these examples with the standard examples of presupposition projection, where preferences are generally quite pronounced, it

[10] The term 'autohyponym' is due to Horn (1984), who also has a Yankee example (cf. McCawley 1981).

becomes highly unlikely that anything like the IP is at work in the examples just cited.

Of course, this is not a knockdown argument, because the IP is a violable constraint, and it is always possible to claim that, in each of (19)-(21), it is outranked by other constraints, which, as it happens, don't enter the fray in presupposition projection. However, this objection remains destitute of force as long as the relevant constraints aren't identified, and it is demonstrated that they take precedence over the IP. Note, furthermore, that the IP, when applied across the board, predicts that negation would reverse the preferences predicted for (19)-(21). For example, (19) is then predicted to contrast with:

(22) Fred didn't pick a fight with a Yankee.
   i. Fred didn't pick a fight with an inhabitant of the Northern States of the US.
   ii. Fred didn't pick a fight with an inhabitant of the US.

But even if there is a distinct preference for the first reading of (19), which I doubt very much, I am quite sure that the presence of a negative expression doesn't alter this preference.

The most elaborate attempt at showing that the IP (or at least something very much like it) applies in a non-presuppositional domain is Dalrymple *et al.*'s (1998) theory of reciprocals. It is a familiar observation that sentences containing reciprocal pronouns admit of various types of interpretations, which are conditioned by world knowledge. The following examples are all from Dalrymple *et al.*'s paper:

(23) a. House of Commons etiquette requires legislators to address only the speaker of the House and refer to each other indirectly.
   b. As the preposterous horde crowded around, waiting for the likes of Evans and Mike Greenwell, five Boston pitchers sat alongside each other: Larry Anderson, Jeff Reardon, Jeff Gray, Dennis Lamp and Tom Bolton.
   c. They climbed a drainpipe to enter the school through a high window and stacked tables on top of each other to get out again.

Dalrymple *et al.* observe that the preferred interpretations of these sentences can be ordered in terms of strength. (23a) says that every pair of legislators are required to refer to each other indirectly; (23b) says that the Boston pitchers were sitting in a row; and (23c) says that every table either supports or is supported by at least one other table. To see that these readings can indeed be ordered by means of entailment, it may be helpful to abstract away from all irrelevant particulars, as follows (see Dalrymple *et al.*'s paper for a more precise

formulation). Let A be the domain of quantification and R the relation in question. Then the preferred readings of (23a-c) make the following requirements:

(24) a. Every individual in A participates in R with every other individual in A.
b. Every individual in A participates in R with every other individual in A, if not directly then indirectly.
c. Every individual in A participates in R with at least one other individual in A.

Clearly, as long as the domain of quantification isn't too small, (24c) is entailed by (24b), which in its turn is entailed by (24a). Dalrymple *et al.* go beyond these observations by distinguishing six possible (sentence) meanings any token of *each other* may give rise to. (For reasons that I fail to grasp Dalrymple *et al.* also maintain that *each other* is not ambiguous.) These readings are partially ordered in terms of entailment, and this ordering determines which reading is preferred in a given situation, because the hearer will choose the strongest reading that is consistent with his beliefs about the world. This is what Dalrymple *et al.* call the 'Strongest Meaning Hypothesis' (SMH); it is a special case of the IP.

There are a number of problems with this analysis, but I will focus here on what I take to be the most fundamental objection, which is simply that the SMH is an almost idle wheel in Dalrymple *et al.*'s theory. To see why, consider (23c), and its schematic interpretation, (24c). According to the SMH, this reading is the outcome of a selection process which first discards (24a) and (24b), in that order, because they are inconsistent with our knowledge about tables and what it means for objects to be stacked on top of each other. But if non-linguistic knowledge must be employed to weed out incorrect readings, why not use it to directly select the correct reading? The crucial factor in Dalrymple *et al.*'s account of the examples in (23) is world knowledge. Informativeness only needs to be brought into play because it is assumed that world knowledge cannot *select* a reading but will only serve to *eliminate* readings. This assumption cannot simply be taken for granted.

In order to show that strength is implicated in the interpretation of reciprocals, one should turn to examples where world knowledge is *inert*, because the SMH leads us to expect that in such cases speakers' intuitions will be solely determined by strength. So let us add two new words to the English lexicon, but without saying what they mean, and consider the following statement:

(25) The yogs are zogging at each other.

Since world knowledge about yogs and zogging cannot possibly play a role here, it follows from the SMH that the strongest interpretation of (25) is preferred, i.e. every pair of yogs are zogging at each other. As far as I can determine this prediction is incorrect: this sentence may have any number of interpretations, and in the absence of further information about yogs and zogging, it is no use asking which of these is preferred. Another way of driving home the same point is by means of the following riddle:

(26) I have here a number of tennis balls, which I have arranged in such a way that they touch each other. Question: How many tennis balls do I have?

If Dalrymple *et al.* were right, there should be a distinct preference for one unique answer, viz.: 'Four.' This prediction is manifestly incorrect.

It's wrap-up time. I have argued that the IP does not improve on the BP, be it empirically or conceptually: the IP's predictive success is somewhat less than the BP's, and it is a mistake to think that the IP is less *ad hoc* because (a) there is no solid evidence that the IP applies beyond the presuppositional domain, (b) even if it did, the IP would call for justification just as much as the BP does.

If the IP isn't a satisfactory solution to the problem sketched at the outset, what is? The shortest answer I can currently give to this question is that I don't know, but I have a longer answer, as well. It is that I see a number of tacks one might pursue, but have not yet made up my mind which is the right one. So, to end on a positive note, let me briefly outline the options I have in mind.

First tack

Instead of stipulating that speakers have a proclivity for maximizing informativeness, as the IP does, one might suppose that they strive to maximize relevance. The major advantage of this move is that it hinges on a principle that can stand on its own, for nobody will deny, I take it, that speakers are relevance seekers in *some* sense. But there are disadvantages, as well. For one thing, in the absence of an adequate relevance metric this solution will be difficult to make explicit. For another, even if we cannot say exactly what relevance is, it is by no means intuitively clear that the BP always reflects our relevance judgments. For example, I have argued that the BP correctly predicts that a presupposition triggered in the nuclear scope of a quantifier will generally be accommodated in the restrictor (if binding and global accommodation are ruled out, that is). But I don't see why the resulting readings should be deemed more relevant, *ceteris paribus*, than the ones we obtain if the presupposition remains *in situ*.

Second tack

We could deny the premise that the BP stands in need of reduction or justification. According to most latter-day accounts, presuppositions are bits of information that are presented as given in the context of discourse. This much is common sense, but our near-truism takes on an less trivial aspect in a dynamic theory of interpretation, like DRT or context-change semantics, which hold that there may be any number of contexts open at any given time. In DRT, these contexts are the DRSs that are accessible from the spot at which an expression is interpreted. So if the speaker signals that something is given in *the* current context, something like an ambiguity arises. But it is *obvious* how such ambiguities will be resolved: the main context (i.e. the principal DRS) will generally be preferred *precisely because* it is the main context. Period.

I am somewhat ambivalent towards this solution. From time to time it strikes me as blatantly obvious and utterly satisfying; but most of the time it doesn't.

Third tack

In Geurts (1999b) it is suggested that the BP has nothing to do with presupposition *per se*, but applies to backgrounded material in general. Crudely put, the idea is that the bulk of the information contained in a sentence will float up to the main context, because only the small part the speaker wants to focus on stays where it is. This is rather similar to what Horn has dubbed 'assertoric inertia':

> Semantically entailed material that is outside the scope of the asserted, and hence potentially controversial, aspect of utterance meaning (Stalnaker 1978) counts as *assertorically inert* and hence effectively transparent to NPI-licensing and related diagnostics of scalar orientation. (Horn 2000)

Thus presuppositions tend to go up because they aren't asserted. Sadly, however, this will hardly qualify as an explanation as long as it isn't explained *why* assertorically inert material is 'effectively transparent'. But at least this suggestion widens the problem, and that might a good thing.

Address for correspondence:

Department of Philosophy
University of Nijmegen

Postbox 9103
6500 HD Nijmegen
The Netherlands

bart.geurts@phil.kun.nl

http://www.phil.kun.nl/tfl/bart/

References

Beaver, D. 1994: Accommodating topics, in P. Bosch and R. van der Sandt (eds.), *Focus and Natural Language Processing. Vol. 3: Discourse*. Working Papers of the Institute for Logic and Linguistics Vol. 8, IBM, Heidelberg.

Blutner R., this volume: Some aspects of optimality in natural language interpretation.

Crain, S. and M. Steedman 1985: On not being led up the garden path: the use of context by the pyschological parser. In: D.R. Dowty, L. Karttunen, and A. Zwicky (eds.), *Natural Language Parsing: Psychological, Computational, and Theoretical Perspectives*. Cambridge University Press.

Dalrymple, M., M. Kanazawa, Y. Kim, S. Mchombo, and S. Peters 1998: Reciprocal expressions and the concept of reciprocity. *Linguistics and Philosophy* 21: 159-210.

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

Geurts, B. 1999a: *Presuppositions and Pronouns*. Elsevier, Oxford.

Geurts, B. 1999b: Specifics. In: B. Geurts, M. Krifka, and R. van der Sandt (eds.), *Focus and Presupposition in Multi-Speaker Discourse*. Workshop reader, ESSLLI 99, Utrecht. Pp. 99-129.

Geurts, B. and R. van der Sandt, 1999: Domain restriction. In: P. Bosch and R. van der Sandt (eds.), *Focus: Linguistic, Cognitive, and Computational Perspectives*. Cambridge University Press. Pp. 268-292.

Grice, H.P. 1981: Presupposition and conversational implicature. In: P. Cole (ed.), *Radical Pragmatics*. Academic Press, New York. Pp. 183-198. Reprinted in Grice (1989: 269-282).

Grice, H.P. 1989: *Studies in the Way of Words*. Harvard University Press, Cambridge, Mass.

Haspelmath, M. 2000: Optimality and diachronic adaptation. *Zeitschrift für Sprachwissenschaft*.

Heim, I. 1982: *The Semantics of Definite and Indefinite Noun Phrases*. Ph.D. thesis, University of Massachusetts, Amherst.

Heim, I. 1983: On the projection problem for presuppositions. *Proceedings of the West Coast Conference on Formal Linguistics* 2: 114-126.
Heim, I. 1992: Presupposition projection and the semantics of attitude verbs. *Journal of Semantics* 9: 183-221.
Horn, L.R. 1984: Ambiguity, negation, and the London School of Parsimony. *NELS* 14: 108-31.
Horn, L.R. 2000: Assertoric inertia. Paper presented at the LSA meeting, Chicago.
Kamp, H. 1981: A theory of truth and semantic representation. In: J.A.G. Groenendijk, T.M.V. Janssen, and M.B.J. Stokhof (eds.), *Formal Methods in the Study of Language*. Mathematical Centre Tracts 135, Amsterdam. Pp. 277-322.
Kamp, H. and U. Reyle 1993: *From Discourse to Logic*. Kluwer, Dordrecht.
Karttunen, L. 1973: Presuppositions of compound sentences. *Linguistic Inquiry* 4: 167-193.
Karttunen, L. and S. Peters, 1979: Conventional implicature. In: C.-K. Oh and D. Dinneen (eds.), *Syntax and Semantics, Vol. 11: Presupposition*. Academic Press, New York. Pp. 1-56.
Lewis, D. 1973: *Counterfactuals*. Harvard University Press, Cambridge, Mass.
Lewis, D. 1979: Scorekeeping in a language game. *Journal of Philosophical Logic* 8: 339-59.
McCawley, J.D. 1981: *Everything that Linguists have Always Wanted to Know about Logic but were Ashamed to Ask*. Blackwell, Oxford.
Stalnaker, R.C. 1968: A theory of conditionals. In: N. Rescher (ed.), *Studies in Logical Theory*. Blackwell, Oxford. Pp. 98-112.
Stalnaker, R.C. 1974: Pragmatic presuppositions. In: M.K. Munitz and P.K. Unger (eds.), *Semantics and Philosophy*. New York University Press. Pp. 197-213.
Stalnaker, R.C. 1978: Assertion. In: P. Cole (ed.), *Syntax and Semantics, vol. 9: Pragmatics*. Academic Press, New York.
Strawson, P.F. 1964: Identifying reference and truth-values. *Theoria* 30: 96-118.
Van der Sandt, R.A. 1992: Presupposition projection as anaphora resolution. *Journal of Semantics* 9: 333-377.
Yeom, J.-I. 1998: *A Presuppositional Analysis of Specific Indefinites: Common Grounds as Structured Information States*. Garland, New York.
Zeevat, H. 1992: Presupposition and accommodation in update semantics. *Journal of Semantics* 9: 379-412.
Zeevat, H. 1999: Old material. In: B. Geurts, M. Krifka, and R. van der Sandt (eds.), *Focus and Presupposition in Multi-Speaker Discourse*. Workshop reader, ESSLLI 99, Utrecht. Pp. 161-168.