Resolution and Accommodation

Comments on

The kinematics of presupposition, Two birds and one stone

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Anaphoric presupposition and zero-anaphora

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Presupposition and accommodation in update semantics

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Introduction

It is generally agreed upon that an adequate theory of presupposition should comprise two major components, an account of presuppositional satisfaction and an account of presuppositional accommodation. Theories of presuppositional satisfaction were developed in the seventies by Stalnaker (1973, 1974) and Karttunen (1974) and taken up by Heim (1983) in the early eighties. Retrospectively Gazdar's (1979) theory can be seen as a (and the first) account of presuppositional accommodation, though it was never formulated in these terms.[1] An account of presupposition formulated in terms of constraints on accommodation is found in van der Sandt (1982, 1988).

The two types of theories seem to differ profoundly. While according to theories of satisfaction presuppositions are inherited in an essentially monotonous way, accommodation is a non-monotonous repair mechanism which adjusts the context of utterance in case certain requirements are not met. And while theories of satisfaction specify under what conditions the presupposition triggered by a certain subconstituent is satisfied by the context of utterance, theories of accommodation essentially specify a set of constraints which prohibit accommodation being otherwise the default strategy. The first claim to the effect that both mechanisms are involved in presupposition projection is found in Soames (1982). Soames observed that Karttunen's and the Gazdar/Soames theory give rise to a set of complementary counterexamples. He concluded from this that

1. An interpretation of Gazdar's theory as a mechanism of accommodation relies on the fact that in his system pre-suppositions are projected from embedded positions to the main context, unless they are blocked by contradicting information or conflicting (conversational) implicatures. These latter factors thus act as constraints on the possibility of accommodation. A flaw in Gazdar's theory as in Van der Sandt (1982/88) is that accommodation is not treated as a repair mechanism. Instead presuppositional information is incremented into the next context in the same way as assertoric information is. Another way of interpreting Gazdar's system, which is certainly closer to the author's original intentions and formulation is to interpret his system as a default inheritance mechanism.

both theories should somehow be combined and though his actual solution (first apply a set of cancellation rules and filter the remaining presuppositions through Karttunen's inheritance rules), did not yield an adequate theory, his basic intuition that both Karttunen type satisfaction (resolution) rules and pragmatic devices capable of blocking accommodation are needed to get an adequate account of presupposition, turned out to be right. Several approaches to resolution and accommodation have been proposed since then. Different attempts to incorporate both a resolution and an accommodation mechanism in an integrated theory of presupposition are found in Heim (1983) and Van der Sandt (1989, 1992). A major issue with respect to presuppositional satisfaction is whether resolution can be given in essentially the Karttunen way, that is in terms of entailment, or whether resolution is an purely anaphoric process on a par with pronoun resolution. An issue with respect to accommodation is whether this mechanism should be allowed as a non-compositional repair strategy or should be replaced by some other mechanism which better suits Montagovian feelings of elegance.

The papers in the current volume discuss the issues just mentioned. Kjell Sæbø's *Anaphoric presupposition and zero anaphora* discusses the anaphoricity of presuppositional expressions in detail and applies his account to the treatment of zero- anaphora. Beaver in *The kinematics of presupposition* and *Two birds and one stone* reconstructs the Karttunen/Heim approach in the framework of Veltman's update semantics and proposes a way to strengthen presuppositional inferences which is essentially accommodation free. Zeevat's *Presupposition and accommodation in update semantics* presents a detailed comparison of the theories of Heim and Van der Sandt and develops the latter further by restating the anaphoric account in update semantics and by giving a compositional account of accommodation in terms of stack updating. This paper moreover addresses the much neglected problem of presupposition projection in attitude contexts.

1 Resolution by entailment and resolution by binding

The central notion in Karttunen's and Stalnaker's original account (adopted by Heim, 1983) is entailment. The account requires that the presuppositions of a carrier sentence should be entailed by the context of utterance in order for this context to admit (or satisfy-the-presuppositions-of) this sentence. If it does, the presuppositions may be said to be resolved.[2] Logical connectives and operators

2. For the purposes of this paper I will use the term resolution loosely to refer both to anaphoric binding of a presupposition and to satisfaction by entailment. I will not use this term for for accommodation (which is in fact an alternative way to satisfy the presuppositions of a sentence). This is inaccurate in two respects. Firstly, satisfaction by entailment and anaphoric binding are at least according to the view of the author of this paper two different things, and, secondly, in a DRT-account accommodation may be constructed as an alternative way to resolve a presuppositional anaphor. I will nevertheless maintain this inaccuracy in order to maintain consistency with the terminology used in the papers discussed and in order to make a strict division between binding on the one hand and accommodation on the other. Information may flow from a presuppositional expression to the common ground in two different ways. Both involve a transfer of information. When identifying a variable in a presuppositional expression with a previously established discourse referent, this referent

create intermediate (or local) context. Now if ϕ is a complex sentence, presupposition resolution is defined recursively by associating with each constituent sentence of ϕ its own local context. The presuppositions of a complex sentence will be resolved iff each presupposition of a constituent sentence is entailed by the local context associated with this constituent sentence.

This theory can easily be reconstructed in update semantics as is shown in different ways by Beaver and Zeevat. The clauses for the logical connectives recursively define the local context for each sub-sentence in terms of the initial information state and the intermediate states arrived at by applying the update clauses. Following Heim (1983) presuppositions can be interpreted as definedness conditions on the contextual update. For a sentence containing a presupposition inducer triggering a presupposition ϕ the update with respect to an information state σ will only be defined iff $\sigma[\![\phi]\!] = \sigma$. Presuppositions have to be locally satisfied. If they are not, the update has to be rescued by accommodation.

So far this yield exactly the predictions Karttunen arrived at. Negation and epistemic modalities are transparent to presuppositions. So are the presuppositions occurring in the first conjunct of a conjunction and those in the antecedent of a conditional. Presuppositions in the second conjunct of a conjunction or the consequent of a conditional are weakened. And, though in unembedded environments modus ponens restores the full presuppositional force for conjunctions, the presuppositions of a conditional only emerge in conditional form. Thus the sentence *If baldness is hereditary, John's children are bald* will not be predicted to presuppose that John has children, but that he has children, if baldness is hereditary. An omission in both Beaver and Zeevat is that they do not give a clause for disjunctions.[3]

Note that this mechanism is strictly deterministic. On this account resolution does not involve a search for possible antecedents in order to select among these. If a presupposition is entailed by the current information state (the local context) it is resolved, if not accommodation in whatever form should apply. This

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will inherit all the descriptive material associated with the presuppositional expression. This is presumably the reason why Kamp en Roßdeutscher (1992) claim that anaphoric binding and presuppositional accommodation normally go hand in hand. This, however, is not accommodation in the sense I will use it. Accommodation proper involves the creation of a new discourse referent, thereby establishing an antecedent which thus inherits all the descriptive material of the presuppositional trigger.

3. The reason is presumably that disjunctions are extremely difficult to handle in a Karttunen type framework, as has been discussed at length by Soames (1982). It is easy to show that his arguments carry over to the update approach. A symmetric and static definition would wrongly predict that the presuppositions of one disjunct of a disjunction are always inherited. On the other hand it is easy to define disjunction in terms of negation and implication, but this would wrongly make disjunctions one- way dynamic. If we don't allow for local or intermediate accommodation as in Beaver, disjunctions where both disjuncts contain contradictory presuppositions (*Either the king or the president of France opened the exhibition*) preclude a definition which would retain any substantial presupposition in any disjunction. A theory which allows accommodation at different levels as reconstructed by Zeevat in the framework of update semantics can handle these examples. Unfortunately such a solution does not carry over to pronouns or triggers like *too* which are so weak in descriptive content that they generally resist accommodation.

determinism is adopted by both Beaver and Zeevat. Beaver takes the Karttunen/Heim rules as starting point for his analysis. Zeevat assumes that the function mapping the discourse referents of the presuppositional expression to variables is unique and thus also adopts determinism. He remarks, however, that it might be more realistic to switch to a non- deterministic resolution scheme which would allow a search for different possible antecedents and thus allow more solutions "but at the price of losing the clarity of a deterministic update notion". This would not be the only price however. Switching to a non-deterministic update scheme would also pose difficulties for the close correspondence he tries to establish between Heim's deterministic update rules and Van der Sandt's resolution.

Sæbø remarks:

> As it appears it is possible to state a precise definition of anaphoric presupposition which is unrealistically strong, imposing determinism ... and disallowing accommodation, and on the other hand, it is possible to state definitions which are too weak, such as Van der Sandt's resolution and Kamp & Roßdeutscher's justification; but a reasonable middle way is hard to find.

Sæbø accepts a non-deterministic rule as a necessary condition for presuppositional satisfaction, but his (tentative) definition requires that there be a unique function which maps the referents of a presupposition DRS to the incoming DRS thus "abstracting away from the resolution problem". Even for a tentative definition this is too much. It is not necessary either. If we accept the claim, as Sæbø does, that presuppositional expressions are anaphors, I do not see a problem to go for non-deterministic resolution straight away. Anaphora resolution is essentially an non-deterministic process and nearly always involves a search for possible antecedents. A deterministic account predicts that once the information triggered by the presupposition inducer is found the associated marker constitutes the antecedent for the presuppositional expression. Now I will not deny that this may constitute a sufficient condition for anaphoric linking, but it certainly is not a necessary one. The local context may contain a number of entities with their associated conditions each of which entails the anaphoric expression. So even if we would adhere, wrongly in my opinion, to the rule that an antecedent has to entail the anaphoric expression, each of these would be a possible antecedent for the anaphoric expression and the actual antecedent would still to be selected from these. Nor is entailment required as Sæbø points out himself in a number of examples. The minimal requirement is compatibility. This does not mean that no other factors might be involved in the search for the actual antecedent, but it seems an unreasonable requirement that the definition of resolution should single out a unique interpretation in every case. A resolution algorithm should be sufficiently constrained to allow a number of possible (or acceptable) interpretations. A preference order on the resulting set determined by the relative distance, discourse structure and relevance or plausibility considerations might single out the preferred interpretation. The determination of these factors fall only in part in the domain of presupposition theory. An anaphoric theory of presuppositions thus predicts that presuppositional anaphors may be genuinely ambiguous.[4] A presuppositional expression may either select between different antecedents or even have the choice between straightforward resolution and accommodation.

Sæbø gives the following example:

(1) Mary loves Jan Tore. Sue, too, loves a Swede.

Such examples show that compatibility should be the basic constraint. Note moreover that such a discourse might contain other individuals which might serve as possible antecedents and note moreover that these would certainly be selected if the true nationality of Jan Tore was known.

2 Strong versus weak predictions

A Karttunen-type theory has a strong intuitive and aesthetic appeal (the rules are straightforwardly derivable in update semantics for example) and its basic ideas turn out to be persistent as the work of Heim and Beaver shows. Adopting this account thus means coming to grip with the numerous counterexamples which are found in the literature. This is, as we will see in a moment, especially pressing if we try to implement it in an account which is essentially accommodation free.

The main problem is that the rules are both too strong and too weak. The relevant counterexamples can thus be divided in two classes. The rules are too weak in predicting conditionalized presuppositions sentences like

(2) If baldness is hereditary, John's children are bald.

which are not predicted to presuppose that baldness is hereditary, but instead the rather awkward (3):

(3) If baldness is hereditary, John has children.

Such conditional presuppositions are especially weak (and difficult to establish empirically) for they are entailed by their carrier sentence anyway. Invoking a theory of presupposition to derive these inferences is thus rather otiose. A fact not mentioned by Beaver is that the same holds for conjunctions embedded under modal operators. These also are predicted to presuppose (3) instead of the presupposition triggered by the second conjunct.

(4) It is possible that baldness is hereditary and that John's children are bald.

Such 'weak' predictions may be sensible for Beaver's (5) where a straightforward relation will be perceived between Mary being in the bath and playing with Bill's rubber duck,

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4. An extensive discussion of a number of cases which are ambiguous in this sense in found in van der Sandt 1992. It is shown that in a number of cases entailment is not even a sufficient condition.

In Geurts (1993) argues for a strict division of labour between between the binding function on the one hand and the insertion of presuppositional material on the other. One example is the following *Harry is sad. Every girl who is dating a boy scout despises him (the boy).* Here we would not want to predict a preference for one of the two possible antecedents and certainly not relegate this task to a presuppositional resolution mechanism.

(5) If Mary is in the bath, then it will be annoying Bill that she is playing with his rubber duck.

but examples like this certainly don't constitute the majority of cases and a mechanism to strengthen these weakened predictions thus seems called for. I will return to this in the next section when I discuss Beaver's account of accommodation.

A second set of counterexamples concerns cases where the predictions are uniformly too strong. Sequences of conditionals with conflicting presuppositions in their antecedents are a case in point.

(6) If the president of France opened the exhibition, the newspapers will have discussed his speech, but if the king of France opened it, they may just have published some gossip.

After the processing the first conjunct information state will be narrowed down to the set of worlds in which there is a president of France (presuppositions of the antecedent of a conditional are always inherited by the update rules) and updating this information state with the second conjunct will then yield the empty information state. Similar problems arise in the case of (7)

(7) It is possible that John does not have children, but it is also possible that his children are on holiday.

In order to update an information state with the first conjunct it is required that the incoming information state is compatible with John not having children, updating this information state with the second conjunct will bring us to an information state where he has. The resulting information state thus wrongly entails that John has children.

One way out is appeal to the notion of discourse structure as in Landman (1986). On this view each conjunct of (6) would be evaluated with respect to a different context, the first containing a president (but not a king of France) and the second containing a king (but not a president). It remains to be seen, however, whether such a solution would not come down to adopting some notion of local accommodation after all. A second option is to switch to a logic in which presuppositions are handled by default rules as shortly discussed in section 4.4 of Beaver's *Kinematics paper*.[5] Note, however, that such an approach requires parallel processing of both conjuncts and note moreover that it is rather unclear how either of the options mentioned would salvage an (admittedly rather exotic) example as the following.

(8) If John's Mac works, he cannot know that it is broken.

for if such a sentence presupposes anything, it certainly is not (9)

(9) If John's Mac works, it is broken.

3 Accommodation and filtering

The examples given in the previous section have been discussed extensively in the literature on presupposition projection in the seventies and early eight-

5. An account of defeasible presupposition which handles examples like (5) is given in Mercer (1992).

ies. They all suggest that some notion of local, intermediate or global accommodation is called for. And again this notion should be non-deterministic but sufficiently constrained to exclude impossible readings. Note first that global accommodation of the trigger would adequately strengthen the predictions which are too weak. (2) would presuppose that John has children instead of the conditionalized version. Note furthermore that accommodation of John's children in the antecedent of the conditional (intermediate accommodation) would also yield a acceptable (though not the preferred) reading. And though global accommodation is generally preferred it would be blocked in Beaver's (5) given the assumption that if Mary is in the bath she will be playing with Bill's rubber duck and thus force accommodation higher up. As I said, the examples (6), (7) and (8) all strongly suggest that some notion of local or intermediate accommodation is called for. In these cases the general constraints on accommodation would block the global variety, forcing local accommodation. This yields the rather plausible readings (10), (11) and (12) for (6), (7) and (8) respectively.

(10) If France has a president and the president of France opened the exhibition, the journals will have discussed his speech, but if France has a king and the king of France opened the exhibition, ...

(11) It is possible that John has no children, but it is also possible that he has and that they are on holiday.

(12) If John's Mac works, it is not possible that it is broken and that he knows that it is broken.

This is in fact the approach Zeevat adopts. Zeevat accommodates the trigger instead of the sentential presupposition which would be computed according to the update rules if presuppositions were taken to be definedness conditions. This yields the results just mentioned.

Accommodation as I sketched it here is essentially a non-monotonous repair strategy. Accommodation repairs the input state so as to guarantee the definedness of the update after all. In his Kinematics paper Beaver presents an ingenuous alternative. An information state is not construed as some set of worlds modelling a hearer's partial knowledge, but as a set of such models, each of which is compatible with the discourse constructed up to that point. These are his epistemic alternatives. If an utterance carries a presupposition it may turn out that some of these alternatives do not correspond with what he took to be the common ground. The alternatives which are incompatible with the presuppositions of the utterance will then be discarded. Presuppositions thus act as filters on epistemic alternatives. During a conversation presuppositions narrow down the set of alternatives under consideration and update will take place with respect to the remaining ones. In this picture accommodation appears not so much a repair strategy as an alternative way of conveying information. As Beaver shows it may be fruitful to pursue this strategy to strengthen predictions which are too weak or to put it in another terminology to mimic the effect of global accommodation. However, as I just pointed out, the crucial case are those where the predictions are too strong, that is where we would want to take recourse to intermediate or local accommodation as a non- monotonous repair strategy. In these cases such a filter will remove too many alternatives. In (6) his filter would narrow down the set of epistemic alternatives to the empty set and in (7) to those alternatives in which John had children.

4 Zero anaphora and the coding of presupposition triggers

In the second half of his paper Sæbø applies the notion of anaphoric presupposition to the analysis of zero anaphora. The basic idea is that zero anaphora can be explained by assuming that the context dependence of a zero argument is a consequence of the resolution of a lexical presupposition triggered by its lexical head. Its anaphoricity thus derives from variables occurring in a presupposition, which in virtue of being anaphoric should be linked up to an antecedent. The zero anaphor is then resolved by the same mechanism which takes care of presupposition resolution. The difference between definite and indefinite ellipsis is explained in terms of the coding of the presuppositional and the assertoric component of the sentence. Definite ellipsis derives from a presupposition involving an implicit anaphoric argument. In indefinite ellipsis the relevant argument is introduced in the assertion. In its strongest form his hypothesis comes down to the following: A zero argument is anaphoric if and only if it occurs in the universe of a presupposition.

Though Sæbø shows convincingly that many cases of zero anaphora are driven by anaphoric presuppositions, I have (like Sæbø) my doubts whether his thesis can be maintained in its strong form. As Sæbø remarks himself (section 3.5.3), in quite a number of cases the 'presuppositions' posited to drive the anaphoric process are probably better analysed as inferences deriving from world knowledge or coherence considerations. The problem is that in order to maintain the claim in its strong form we are forced to posit presuppositions which according to most standards do not deserve this name. *Blame* and *criticise* are cases in point. Consider (13) which I adapt from Karttunen and Peters:

(13) John critized (blamed) Harry for writing the letter. Since the letter was actually written by Mary [and since John knew this quite well] this was quite unfair of John.

Karttunen and Peters suggest that the suggestion that Harry wrote the letter, or that he was responsible for writing the letter or that Bill thought that Harry was responsible for writing the letter, is rather an instance of generalised conversational implicature.

Suspect (which Sæbø suspects himself) is another example.

(14) John suspects Mary of having cheated at the exam.

(14) does not seem to presuppose that there has been cheated at the exam and this can easily be verified by applying one of the well-known diagnostics to isolate presupposition inducers.[6]

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6. Genuine presuppositions tend to survive under non-entailing embedding or when their carrier sentence is questioned.. In all of the following sentences the presuppositional suggestion that John's watch has been stolen survives.

1. It is possible that John knows that his watch has been stolen.
2. If john knows that his watch has been stolen, he will try to find the thief.

Presupposition is an ambiguous notion and has in the past been used for quite a number of different phenomena. There is a danger of watering down the concept of presupposition (in particular the more specific concept of anaphoric presupposition) and extending the notion beyond its domain of applicability. A sharp distinction should be made between presupposition as a linguistic expression requiring an antecedent or inducing some information to be added to the context, presupposition as information taken for granted for the purpose of conversation (or for the purpose of giving an coherent interpretation to the a sentence) and suggestions or inferences which are not strictly part of the meaning of an utterance but normally go with it in view of world knowledge or coherence considerations.

One obstacle in developing a general theory of anaphoric presupposition consists in the fact that different types of triggers differ substantially in their capacity to bind or to accommodate. On the one end of the spectrum we find factive complements and lexical presuppositions which accommodate quite easily, though in different ways. On the other end we find such a diverse collection as particles like *too* and *again*, clefts[7] and transition verbs like *begin*, *stop* and *continue*, which seem to resist accommodation and strongly require an specific entity in the context in order to be instantiated. Definite descriptions are in the middle. They both resolve and accommodate quite easily, though here too a distinction between different types can be made. The issue is addressed in both Sæbø and Zeevat.[8] Zeevat observes that lexical presuppositions and factives project in attitude contexts quite differently from 'resolution' presuppositions like definite descriptions, anaphoric adverbs and *before*, *when* and *after*-clauses. Sæbø discusses in detail the coding of pesuppositional and assertoric part of a sentence and the possibility of variable sharing between presupposition and assertion.

It would be nice if the properties of these different types of triggers could be derived in a principled way from their syntactic coding, semantic properties and the type of content they induce. A starting point is found in Sæbø and Zeevat, but much work remains to be done in this area.

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3. Does John know that his watch has been stolen?

7. Sæbø treats clefts on a par with factives and seems to assume that they accommodate quite well. This is at least inaccurate. In the standard cases clefts have primary accent on the clefted constituent (the stressed focus cleft) and this type requires a direct discourse antecedent. Note that the accommodation of 'Someone had its birthday' in view of the utterance of a cleft like 'It was John who had his birthday' would be rather otiose if the context did not provide some readily identifiable individual to serve as an antecedent. Kripke's observations with respect to presuppositional adverbs like *too* and *again* as reported in Soames (1989) all apply to this type. Sæbø 's remark probably relates to the class of clefts Prince labelled 'informative-presupposition clefts'. They differ both in their stress pattern and information structure from the standard cases. See Delin (1992) for discussion.

8. Beaver takes both in his *Kinematics* paper and in his *Two birds* factives as his paradigm cases. It should be noted that exactly this kind of trigger exhibits a rather deterministic behaviour and can more easily (though not fully adequately) be handled by the notion of satisfaction by entailment. It would be interesting to see how the theory he develops would handle the class of presupposition-inducers that Sæbø discusses as the paradigm examples of anaphoric presuppositions.

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