

Accommodation

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Table of Contents

1	What is accommodation?	2
	1.1 A simple example	2
	1.2 Semantic Presupposition and Pragmatic Presupposition	4
	1.3 Accommodation and Implicature	6
2	Where do we accommodate?	8
	2.1 Multiple Contexts	8
	2.2 A Global Preference	10
	2.3 Trapping	14
	2.4 Conversational Principles	15
	2.5 Multiple Accommodation	19
	2.6 Information structure as a constraint on accommodation	22
3	A Puzzle: Missing Accommodation	24
	3.1 Triggers that do not accommodate	24
	3.2 Explanations of Missing Accommodation	27
4	Conclusion	33

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1. What is accommodation?

1.1. A SIMPLE EXAMPLE

Our heroine has landed herself in a difficult spot. From all sides dangerous criminals are approaching. She reports (1).

(1) I knew they would show no mercy.

Innocent as it may seem, this example is problematic for theories of presupposition that assume that whatever is presupposed must be known to speaker and hearer prior to utterance. (1) contains the word *know* and the use of this verb is generally assumed to presuppose its complement. But our example may well be the first time that our heroine informs us of the treatment she expects at the hands of the villains. The operation that helps us out here is *accommodation*, and involves making it common ground between us and the speaker that the complement is true. Lewis (1979), who brought the term *accommodation* into use among philosophers of language and semanticists, conceived of it as a repair strategy: the hearer recognizes that something is wrong, sees that the day can be saved by adding the missing presupposition and proceeds to do just that.¹

Accommodation is something you do in deference to the wishes of another. This explains why the word *accommodation* is used frequently in the tourist industry. More worrying is that there is also another technical linguistic use of accommodation, namely that in sociolinguistics (Giles et al., 1987). Here it refers to conscious or unconscious attempts by interlocutors to adapt their linguistic habits (e.g. in pronunciation, choice of words and constructions, posture) to the habits of other interlocutors, typically by taking over some of the other interlocutors behavior. While both the sociolinguistic and semantic/pragmatic uses of *accommodation* describe adaptations made to enhance communicational success, the two coinages are distinct and historically unconnected.

¹ Burton-Roberts (1989) and Gauker (1998, 2003) exemplify those who take the existence of cases like (1) to undermine theories of presupposition, particularly the account of *pragmatic presupposition* developed by Stalnaker (1972, 1973, 1974). See von Stechow (2000) for discussion of these arguments. Note that in the 1970s both Stalnaker and Karttunen (1974) gave examples of informative presupposition, and independently described an accommodation-like process, although at that time they did not describe the process as *accommodation*. See also Simons (2003) for discussion of how Stalnaker's views on accommodation depart from those of Lewis. Note that Lewis also introduced the standard technical notion of common ground as mutual knowledge — see Lewis (1969) and also Clark and Marshall (1981).

For the most part, cases of accommodation discussed in this article pertain to presuppositions that are identifiable via a standard set of diagnostics, in particular *projection tests*. The primary evidence that (2a) presupposes (2b) is that (2b) follows not only from utterances of (2a), but also from sentences in which (2a) is embedded. Typically presuppositions follow from embeddings under negation as in (2c), from embeddings under modals as in (2d), and also from embeddings involving questions, conditionals and various other constructions.²

- (2) a. Mary realizes it is raining.
 b. It is raining.
 c. Mary does not realize that it is raining.
 d. Perhaps Mary realizes that it is raining.

Examples of constructions which, according to projection tests, carry presuppositions include a huge range of constructions, such as definite descriptions, factive verbs, aspectual markers, demonstratives, politeness markers, names and various discourse functional markers. Collectively, these are known as presupposition triggers.

Given that accommodation happens, two questions arise: what is accommodated, and where?³ The *where* question arises because in processing a complex sentence multiple contexts may be involved — for example a belief sentence will involve both a global context which the speaker is proposing as the new common ground, and an embedded belief context. We will turn to the complexities that arise when there are a multiplicity of possible accommodation sites in section 2.

As will be discussed below, accommodation is an inferential process which is subject to pragmatic constraints. On the other hand, presuppositions, which accommodation operates on, are standardly (though not universally) taken to arise as a part of lexical meaning, and to engage in complex interactions with semantic operators such as quantifiers, attitudinal predicates and conditionals. Thus the discussion in this chapter will concern one linguistic interface in particular, that between semantics and pragmatics.

² There are by now a large number of handbook articles discussing presupposition, all of which introduce the projection tests. See e.g. the extended articles of Soames (1989), Beaver (1997), or the pithier overviews of Horn (1994;1995) and Roberts (1999).

³ Note that in our technical sense the verb *accommodate* takes as its direct object information, i.e. information which is missing and must be added. This contrasts with the everyday use of *accommodate* for which the direct object is the person for whom we are making adaptations, not the adaptations themselves. Perhaps the contrast reflects a bias of semanticists towards propositions rather than people.

1.2. SEMANTIC PRESUPPOSITION AND PRAGMATIC PRESUPPOSITION

As regards what is accommodated, Lewis took a broad view, not limited to classic cases of presupposition. He considered also accommodation of a point of view (e.g. as when by using *coming* or *going* we take an implicit position near the destination or departure point, respectively), accommodation of a standard of precision in cases of vagueness (c.f. (Barker, 2002)), accommodation of domains of possibilities involved in modal statements, and even accommodation of a getaway car during the formulation of a plan to steal plutonium.

Thomason (1990) is easily read as providing a quite different answer than Lewis to the question of what is accommodated. Thomason takes accommodation to be a move a hearer can make in order that the cooperative intent of the speaker is realized. For him, accommodation is motivated by a need to “Adjust the conversational record to eliminate obstacles to the detected plans of your interlocutor.” Thus accommodated material may include not only facts about the subject-matter of the discourse but also facts about the joint or individual plans of the interlocutors. In contrast, Lewis seems to suggest the simplest possible answer to the question of what is accommodated: accommodate only what is needed.

Suppose we accept the Frege-Strawson view (*contra* e.g. (Gazdar, 1979)) that presuppositions are necessary conditions on meaningfulness associated with particular expression types (*presupposition triggers*, as we now call such expressions). Then Lewis seems to suggest that hearers would accommodate whatever is the minimum information needed to satisfy those conditions. That is, if an expression presupposes p , and p is not satisfied, what we accommodate is just p . This is close to what is found in the account of van der Sandt (1992) (see also Zeevat (1992) and Geurts (1999) for developments of the theory). But Thomason’s account implies that what is accommodated could stand in a much more nebulous relation to what is conventionally presupposed: we accommodate whatever seems most appropriate to make sense of the speaker’s intentions in the light of our joint communicational goals. That is, while what we accommodate must satisfy conventionally signaled presuppositions, it may also incorporate other information. Much of what Grice calls *conversational implicature* might fall under Thomason’s notion of accommodation.⁴

⁴ Hobbs’ abductive account of comprehension is related to Thomason’s, and also subsumes accommodation and implicature within a broader computational setting. Much of the relevant work remains unpublished, but see Hobbs et al. (1990). Another inferential framework which unites implicature and accommodation is that set out by Asher and Lascarides (1998, 1999, 2003), who take presupposition accommodation

To adopt standard terminology, let us term necessary conditions on meaningfulness *semantic presuppositions*, something close to that described by Frege (1892) and Strawson (1952). Following Stalnaker (1972), let us term what a speaker takes for granted *pragmatic presuppositions*. Then the idea of accommodating more than is presupposed may be sharpened as follows: whatever is semantically presupposed is pragmatically presupposed, but semantic presuppositions are only a weak reflection of the full set of assumptions made by speakers. When a hearer detects a semantic presupposition, the hearer tries to understand what set of speaker’s assumptions lie behind it. The hearer accommodates a best guess as to what these assumptions are.

This view of accommodation is compatible with that developed in the Context Change model of presupposition developed by Heim (1982, 1983), a model which builds on that of Karttunen (1973, 1974) as well as Stalnaker’s and Lewis’ work. In the Context Change model, *semantic presupposition* corresponds not to conditions on meaningfulness, but rather to conditions on appropriateness of the update: normally, we only use a sentence to update our information state if the presuppositions of the sentence are satisfied in our existing information state. Accommodation must occur whenever our existing information state does not satisfy the presuppositions associated with the sentence being processed — a view very much in tune with Lewis’s. However, Heim is not explicit as to whether what is accommodated corresponds to what is semantically presupposed or what is pragmatically presupposed (if either). Beaver (1999, 2001) argues that the Context Change model must be extended such that pragmatic presuppositions are accommodated, and ends up with a model which has much in common with Thomason’s. Examples which Beaver attempts to account for include the following:

- (3) If Spaceman Spiff lands on Planet X, he’ll notice that he weighs more than on Earth.

The semantic presupposition of (3) depends upon whose theory of semantic presupposition is adopted. It might be either that Spiff weighs/will weigh more than on Earth, or that if Spiff lands on X he’ll weigh more than on Earth. However, Beaver maintains that what we accommodate corresponds to neither of these. Rather, it seems that the speaker might plausibly be assuming that Planet X has a particularly high gravitational field, such that whenever someone lands on X, that person weighs a lot. Beaver suggests that a hearer might accommodate

to be subsumed under a more general operation they term “binding [...] to the context with a rhetorical relation.”

this stronger, universal proposition, or some other set of assumptions which entail what is semantically presupposed.⁵

1.3. ACCOMMODATION AND IMPLICATURE

Accommodation involves a hearer's inference. But not all hearer's inferences count as accommodation. It is worth considering to what extent accommodation is distinguished from conversational implicature, especially since work like Thomason's ties accommodation and conversational implicature closely together.

When discussing conversational implicatures it is helpful to restrict attention to generalized implicatures such as those associated with scales, e.g. "Mary is content" implicating that Mary is not in a state of ecstasy. Thus we ignore for the moment particularized implicatures, those which follow from specific facets of a given conversational context rather than from general properties of language or the lexicon. None of the cases of accommodation we consider here are candidates for particularized implicatures, since they are inferences which regularly occur whenever certain lexical items are used. Particularized implicatures tend to be independent of specific lexical items: they are *detachable* in the terminology of Grice (1989) — see also Levinson (1983) on detachability, or Levinson (2000) for an extensive recent study of conversational implicature, though he concentrates on generalized rather than particularized implicatures.

Generalized conversational implicatures resemble accommodation in that they involve inferences that go beyond the ordinary content of the sentence. The main property differentiating these two types of inference concerns the role of context and what is taken for granted. Generalized conversational implicatures concern new information: the speaker typically believes that the hearer was unaware of the content of the implicature prior to the utterance, and does not assume the implicature would have been contextually available to the hearer if there had been no utterance. On the other hand, accommodation concerns information that the speaker assumes is independently available to the hearer (or, *pace* Stalnaker (1974), that the speaker pretends to assume is available.)

There is a grey area between accommodation and implicature. In the classic case of a sign like that in (4), the author of the sign need not assume that the fact that cheques are unacceptable is common ground.

- (4) The management regrets that this establishment cannot accept cheques.

⁵ See Geurts (1999) for critical discussion of Beaver's model. The accounts of Hobbs and of Lascarides and Asher (see fn. 4) also allow that more information is accommodated than is minimally necessary to satisfy semantic presuppositions.

Similarly, once we move to particularized implicatures, there is often such a mixture of presupposition and implicature that the two cannot be cleanly distinguished. The utterer of (5) appears to presuppose ownership of a bike, but does the speaker presuppose or implicate that the bike was the method of transport that was (or would have been) used to transport the speaker? How about the implication that if the bike had been in working order, the speaker would not have been late? Quite possibly, both presupposition and implicature are involved at every stage. For example, the speaker may take it for granted that most hearers know the bike was to have been used, and yet believe that there are also further hearers who will have to infer this information.

(5) I am sorry I am late. My bike has a flat.

In spite of the existence of individual cases that are hard to classify, the bulk of inferences we will consider in this paper clearly concern accommodation rather than Gricean implicature: they concern adaptation on the part of the hearer in the face of assumptions that the speaker has made, and are not obviously derivable using arguments based on Grice's maxims.⁶

If accommodation occurs in response to assumptions that the speaker has made, then we might expect that anything which indicates that something has been assumed could trigger accommodation. Lewis has often been taken to say as much:

Say something that requires a missing presupposition and straight-away that presupposition springs into existence, making what you have said acceptable after all. (Lewis, 1979, 339)

Contra Lewis, accommodation is a tightly constrained process. For one thing, hearers do not like to accommodate what is plainly implausible: given the opportunity they would normally express disquiet at being asked to do so. Also, hearers do not accommodate destructively, which would overwrite something which has already been accepted as the common ground — a principle we shall return to in section 3.2. As we shall see, constraints on what can be accommodated and where the accommodation takes place go a lot further than just a tendency to avoid contradiction.

⁶ In asserting that the accommodated material could not easily be derived from Grice's maxims (Grice, 1989), we are taking a standard position, but not an uncontroversial one. Rob van der Sandt (p.c.) suggests that the most obvious support for this standard position is the fact that, *contra* presuppositions "implicatures normally do not project [...] but are computed on the basis of a full utterance." Despite such *prima facie* difficulties, many authors have tried to derive presuppositional behavior using neo-Gricean argumentation. For a recent example, see Simons (2001).

The core of this article, section 2, consists of a discussion of the different contexts in which accommodation can take place, and the pragmatic principles which select between those contexts. In section 3 we consider a puzzle: Lewisian accommodation applies equally to all presuppositional constructions, so it cannot easily explain why, as a matter of empirical fact, some presuppositions are accommodated much more easily than others. We review the data, and consider some lines of explanation. Finally, in section 4 we draw some general conclusions about progress that has been made in understanding accommodation, discuss its significance for the study of presupposition and other phenomena, and consider what remains to be done.

2. Where do we accommodate?

2.1. MULTIPLE CONTEXTS

Consider (6), which involves a definite description “his first child”, and contexts [1], [2], [3] and [4]. These contexts correspond, respectively, to what the speaker proposes (or assumes) as the common ground, what the speaker proposes John is convinced of, what the speaker proposes John considers a hypothetical possibility, and what the speaker proposes John considers to be consequences of such a hypothetical.

- (6) [1] John is convinced that [2] if [3] his first child is diligent, [4] she’ll grow up to become president.

A first clue as to where accommodation is possible is obtained by considering variants of the example in which the presupposition is added explicitly, as if it were part of the ordinary content of the sentence.

- (7) a. John has one or more children, and he is convinced that if his first child is diligent, then that child will grow up to become president. (*Accommodation in [1].*)
 b. John is convinced that he has one or more children and that if his first child is diligent, then that child will grow up to become president. (*Accommodation in [2].*)
 c. John is convinced that if he has one or more children and his first child is diligent, then that child will grow up to become president. (*Accommodation in [3].*)
 d. ?? John is convinced that if his first child is diligent, then he has one or more children and that (the first) child will grow up to become president. (*Accommodation in [4].*)

What we observe is that accommodation in context [4] would not produce a felicitous discourse, and it certainly wouldn't reduce the sentence's presuppositions. However, accommodation in contexts [1] – [3] would result in a common ground analogous to that produced directly by update with the first three sentences in (7). Consideration of the four alternatives leads us to suggest a general principle which we believe is implicit in much prior work on accommodation:

The Principle of Explicit Addition Accommodation is only possible in contexts where explicit addition of the accommodated material would (i) produce a felicitous discourse, and (ii) result in a text which lacked the original presupposition.

This principle is of great generality. It applies not only to accommodation of standard presuppositional material, as detected by the projection test, but also to accommodation of material which may not be explicitly presupposed. A plausible example is the form of accommodation introduced by Roberts (1987, 1989). She considered data involving *modal subordination*, whereby anaphoric reference between separate non-factual contexts is possible. This phenomenon is exhibited by (8), where the pronoun *she* refers back to John's hypothetical daughter, in a way that would be impossible on many standard accounts of anaphoric reference such as Kamp (1981). There are various ways of understanding how this example functions, but one possibility is that the pronoun *she* is associated with a presupposition that there is a discourse marker available for a salient female. Since this presupposition is not met, accommodation must occur. Yet what is accommodated is not merely a discourse marker for an arbitrary female (the presupposition of the pronoun as given by standard projection tests), but a discourse marker for John's daughter.

- (8) Perhaps John has a daughter. [1] If [2] she is over 18, she has probably left home.

Now note that in principle there are at least two places where accommodation might occur, the global context represented by [1], and the local context of the trigger, given by [2]. Accommodation in either of these locations would satisfy the requirement of the pronoun that there is an accessible female antecedent. Accommodation at site [1] would produce the infelicitous text in (9a), whereas accommodation at site [2] produces a quite acceptable text as in (9b). The Principle of Explicit Addition then correctly (but not very surprisingly) predicts that, provided we could somehow narrow the choice to the two alter-

native interpretations in (9a) and (9b), the second must be the correct interpretation.⁷

- (9) a. ? Perhaps John has a daughter. John has a daughter and if she is over 18, she has probably left home.
- b. Perhaps John has a daughter. If John has a daughter and she is over 18, she has probably left home.

2.2. A GLOBAL PREFERENCE

Our proposed principle of explicit addition is closely related to a generalization made explicit by van der Sandt (1982, 1988) and Seuren (1985). They observed that an utterance of a sentence leads to presupposition projection only when explicit statement of the presupposition prior to the utterance would have yielded a felicitous discourse. For example, given that the fact that (7a) is felicitous, this generalization leads us to predict that the presupposition that John has one or more children will project from (6).

Rather than saying that the presupposition projects to produce the interpretation in (7a), we will say that the presupposition is *globally accommodated*. Similarly, we describe the interpretation in (7c) as involving *local accommodation* in the context of the trigger. The interpretation in (7b) involves accommodation in a context intermediary between the trigger and the global context, and we refer to the process that produces this interpretation as *intermediate accommodation*.⁸

Fronting Principle Global accommodation, or, equivalently, presupposition projection, is preferred to other forms of accommodation just in case fronted addition of the presupposition would produce a felicitous discourse.

The most developed theory governing where accommodation might take place is that of van der Sandt (1992) (and secondary literature such as Zeevat (1992), Krahmer (1998), Beaver (2002) and, especially, Geurts (1999)), and we will rely heavily on van der Sandt's framework in the following discussion. First, let us return to Gazdar (1979), who is not ordinarily thought of as presenting a theory of accommodation.

What Gazdar proposed is that by default presuppositions are added to the global context, and otherwise they are cancelled. Being cancelled

⁷ For an account of modal subordination in terms of a theory of presupposition accommodation, see Geurts (1999).

⁸ What most authors term *global accommodation*, Seuren (1985) describes as *backward suppletion*, and van der Sandt (1982;1988) terms *contextualization*.

is almost like disappearing, but, crucially, not quite. Gazdar argues that almost all presupposition triggers entail what they presuppose, so when a presupposition cannot be added to the global context, its content remains in the local context of the trigger. Thus for the cases that have been most discussed in the literature, such as factives and definites, the effect of cancellation in Gazdar's theory is typically indistinguishable from the effect of local accommodation in accounts such as van der Sandt's and Heim's. Furthermore, the fact that Gazdar predicts projection by default, and cancellation only under threat of inconsistency, is equivalent to a general preference for global over local accommodation, as Heim (1983) makes clear.⁹ This takes us to a bolder statement of the above Fronting Principle:

Globality Principle Global accommodation is preferred to local accommodation.

The preference for global accommodation, or an equivalent principle, is central to almost all accounts of presupposition: Atlas (1976), Wilson (1975) and Kempson (1975) try to derive the same effect as the Globality Principle from general considerations of conversational pragmatics; followers of Gazdar (e.g. Mercer (1987)) follow him in assuming global accommodation as a default and innovate primarily by exploring alternative notions of what a default is; and van der Sandt (1992) and following work (e.g. Geurts (1999)) explicitly assumes a preference for global over local accommodation. In fact, van der Sandt (1992) extrapolates from the preference for global over local accommodation, and claims that a similar principle applies when we throw intermediate accommodation into the mix, an alternative not present in any earlier work except Heim's. Van der Sandt uses a (defeasible) principle like the following:¹⁰

Generalized Globality Principle One accommodation alternative is preferred to another if the first is more global (i.e. further from the site of the trigger, and nearer to the global context).

There are two issues that arise with this attractive principle. First, it is unmotivated. Indeed, the simpler preference for global over local

⁹ Although Heim is right that Gazdar's strategy (of cancelling only in the face of inconsistency) is in principle equivalent to a preference for global accommodation, this does not imply that Heim's model is equivalent to Gazdar's. Heim only explicitly considers blocking of global accommodation through inconsistency with the common ground, whereas Gazdar also considers inconsistency with implicatures.

¹⁰ Geurts (2000) terms his procedural variant of Generalized Globality *buoyancy*. As he says, "all *backgrounded* material tends to float up to the main DRS."

accommodation in Gazdar’s theory is also unmotivated, although plausible. Second, it is not clear that van der Sandt’s preference describes the facts, as argued by Beaver (2001).

Consider the following example in which contexts are tagged with numbers for ease of reference:

- (10) I don’t know whether it is raining, but [1] Fred thinks that [2] if [3] Mary is carrying an umbrella then [4] she knows that it is raining.

In (10), the use of *know* in the consequent triggers the presupposition that it is raining. Global accommodation in context [1] is blocked since it would produce inconsistency. Van der Sandt’s preference for maximally global accommodation would then predict that intermediate accommodation in context [2] is preferred over intermediate accommodation in context [3], which in turn is produced over local accommodation (in [4]). So the prediction is that (10) is understood as meaning “I don’t know whether it is raining, but Fred thinks that it is raining and that if Mary is carrying an umbrella she knows that it is raining.” It is not clear to us that this prediction is right. First, in spoken form, the example seems odd unless pronounced with stress within the final “is raining”, and this oddity is unaccounted for. Second, even with this stress pattern, the predicted reading is not available. There seems to be a preference for local accommodation over either of the intermediate possibilities. Thus the preferred reading is “. . . Fred thinks that if Mary is carrying an umbrella then it’s raining and she knows it”.

In response to examples showing that the Generalized Globality Preference produces incorrect predictions, we might consider retreating to the basic Globality Preference, and perhaps stipulating a separate principle to decide between local and intermediate forms of accommodation when global accommodation is unavailable. However, an alternative principle has also been considered, e.g. by Blutner (2000), here, as in Beaver (2001), named for Atlas who uses a similar principle as the cornerstone of all his explanations of presuppositional behavior:¹¹

The Atlas Principle One accommodation alternative is preferred to another if the first produces a logically stronger meaning.

¹¹ A similar principle favoring strong over weak readings is motivated by Dalrymple et al. (1998). An alternative but related idea which we will not explore here is that what must be maximized is not logical strength but informativity or relevance — see e.g. Sperber and Wilson (1984) and van Rooy (2003).

In many cases this principle produces reasonable results. For example, in (11), the principle correctly predicts a preference for global accommodation. And if global accommodation was blocked (e.g. by an earlier admission of the speaker's ignorance as to whether it is raining), then local accommodation would be predicted over intermediate accommodation.

- (11) 1 If 2 Mary's carrying an umbrella then 3 she knows that it is raining.

Note that slight changes in the logical properties of a sentence can produce big changes in what the Atlas principle predicts. Consider the following minimal pair:

- (12) Every woman fed her cat.

- (13) Not every woman fed her cat.

The Atlas Principle faces problems if we extend it from global accommodation — essentially what Atlas was considering — to local and intermediate accommodation.¹² Combined with the Trapping principle (see below), it predicts local accommodation for (12), i.e. “every woman had a cat and fed it”. But intermediate accommodation would be predicted for (13): “not every woman who had a cat fed it.” Thus it is predicted that (12) and (13) could both be true at the same time. Specifically, if all women who own cats feed them but not all women own cats, then, according to the predictions of the Atlas Principle, both sentences are true. While intuitions are subtle, we are dubious about this prediction: given that there are cat owning women at all, (12) and (13) seem intuitively to contradict each other, so that at least one must be false.

The principle also does not seem to help with cases like (10), for here it makes the same incorrect prediction as the generalized Accommodation Principle. Indeed, although the Atlas Principle often predicts a preference for global accommodation, it does not even do this all of the time. In (14), no preference is predicted between global accommodation and local accommodation, since neither of (14a) and (14b), the two accommodation alternatives, is logically stronger than the other.

- (14) Fred thinks Mary knows that it is raining.

¹² For problems with the Atlas Principle, see also the discussion of Geurts (2000). Geurts considers the case of non-monotone contexts, such as the restrictor of the quantifier *most*.

- a. It is raining and Fred thinks Mary knows that it is raining.
- b. Fred thinks it is raining and Mary knows that it is raining.

2.3. TRAPPING

The following example from Heim (1983) is of a standard type involving what we might call *quantifying in* to a presupposition, a phenomenon first discussed by Karttunen and Peters (1979):

(15) Every man loves his king.

Here the presuppositional *his king* occurs within the scope of *Every man*. Many models of presupposition, such as Karttunen (1973, 1974), Gazdar (1979), lack any treatment of this type of example. Other models, such as those of Heim (1983) and Karttunen and Peters (1979) suffer from well known problems, for which the reader is referred to the discussion in Beaver (1997). Van der Sandt's account of the interaction between quantification and presupposition requires stipulation of the following absolute constraint on accommodation¹³:

The Trapping Principle If a presupposition containing a variable x is triggered in an environment where x is bound by a quantifier Q , the presupposition will be accommodated in such a way that x remains bound by Q .

Regarding (15), the possibilities of global, intermediate and local accommodation must be considered. The trapping constraint prevents the presupposition $[y][\text{king-of}(y,x)]$ from being accommodated globally — this would cause the variable x in the presupposition to become unbound. So we are left with only intermediate and local accommodation. Intermediate accommodation would produce the reading *every man who has a king loves him*, while local accommodation would lead to *every man has a King and loves him*. Both readings are plausible. However, note that in the context of a previous sentence “There are 17 men in the room,” the intermediate accommodation reading for (15) vanishes: it seems that every one of the men under discussion must have a king.¹⁴

¹³ It can be reduced to the Explicit Addition Principle, since not following it would create unbound anaphors.

¹⁴ The objection that intermediate accommodation is not available in a properly contextualized version of (15) was made in Beaver (1994). In response, Geurts and van der Sandt (1999) detail a version of their theory which produces predictions more in line with Beaver's in this type of case.

2.4. CONVERSATIONAL PRINCIPLES

Allowing that for current purposes we can take projection and global accommodation to be identical, there is a large literature suggesting that the major constraint on global accommodation is that it must respect general conversational principles, e.g. Grice's maxims. Stalnaker (1974) used this as the basis of an informal pragmatic explanation of why certain factive presuppositions are cancelled, and Gazdar (1979), Soames (1982) and van der Sandt (1988) provided the first formal statements of how the interaction might work.¹⁵ Note that the idea formalized by these latter three authors, is distinct from the suggestion found in work such as Atlas (1976), Wilson (1975) and Simons (2001). What they suggest is not merely that presuppositions must respect conversational principles, but that many or all types of presupposition actually result from conversational principles, so that no conventional stipulation of presuppositions is needed in the lexicon.

Gazdar's account is based upon a principle like the following:

Gazdar's Principle When in conflict, implicatures always prevent global accommodation (i.e. projection) of presuppositions.

As a descriptive generalization, Gazdar's Principle covers a range of standard cases, although many counterexamples are known — see e.g. Beaver (2001, 2004) for empirical discussion.¹⁶ To see the principle in action, consider our now injured heroine's brave words to her comrades, as they valiantly attempt escape from the enemy's evil clutches (to be

¹⁵ Assuming Thomason's notion of accommodation, an explanation of the significance of Gricean principles for accommodation may be attempted along the following lines. Whereas all places of accommodation are equally good for making the presupposition trigger meaningful or pragmatically appropriate, not all of them need to be consistent with the attempt to reconstruct the speaker's intentions. The Gricean maxims are part of what relates the speaker's intentions to the speaker's utterance. So presupposition accommodation has to give way to Gricean maxims, at least when there is no independent reason to think that the speaker is intentionally flouting the maxims.

¹⁶ Rob van der Sandt (p.c.) points out that Gazdar's account of presupposition cancellation relies almost entirely upon a single subtype of implicatures, namely clausal implicatures, the inference that an embedded clause is neither known to be true nor known to be false. Gazdar himself introduced the terminology. Clausal implicatures were not isolated as a subtype in Grice's original work, although there is some antecedent to Gazdar's work: Stalnaker (1974) considers this type of inference without using the term *implicature*. Clausal implicatures may be seen as arising from the maxim of quantity. However, van der Sandt points out that ignorance of the truth-value of an embedded clause is typically a shared assumption of the interlocutors, and not, as would be typical for a Gricean implicature, an extra inference that the speaker intends as new information.

uttered with stress on *make* rather than *realize* in the antecedent, and e.g. *go* and *without* in the consequent):

- (16) If I realize that I can't make it, I'll need you to go on without me.

Gazdar, Stalnaker and others take utterances of conditionals to be associated with an implication that the speaker does not know the truth value of either the antecedent or the consequent. For Gazdar, this implication is a clausal implicature. To be precise, Gazdar predicts that, unless something blocks this implicature, an utterance of (16) implicates that the speaker does not yet know whether she will realize that she cannot make it, and hence does not yet know whether she can or not. Gazdar's principle says that this implicature prevents global accommodation of the presupposition that she cannot, and so correctly predicts that an utterer of (16) does not take not making it to be a certainty.¹⁷

While descriptively interesting, Gazdar's principle seems, in his work, mysterious: why should implicatures defeat presuppositions rather than the other way around?¹⁸ However, within the framework of a theory based around accommodation, Gazdar's Principle becomes more natural. For in such a framework we no longer need to claim that implicatures defeat presuppositions. Rather, we can say that presuppositions must always be satisfied for a discourse to be felicitous, independently of other conversational principles, but that implicatures help us decide on the best way to satisfy the presuppositions. Rather than saying that implicatures and presuppositions are in conflict, we can say that the same conversational principles underly both presupposition accommodation

¹⁷ We know of no explicit discussion in the literature showing that non-clausal implicatures can defeat presupposition. Examples would be:

- i Mary ate two donuts, so Bill obviously doesn't *know* that she ate three.
- ii Fred is always prompt and exhibits great penmanship, but I do not know that he will make a wonderful brain surgeon.

In (i), it could be argued that a scalar implicature (that Mary ate no more than two donuts) cancels the presupposition that she ate three. Example (ii), following in Grice's footsteps, is intended to be thought of as part of a recommendation letter. In this context a particularized implicature is generated that Fred has no skills of relevance beyond penmanship and promptness, and thus that the speaker has insufficient evidence that Fred will make a wonderful neurosurgeon. This apparently defeats the presupposition triggered by the cognitive factive *know*.

¹⁸ Gazdar's account in fact depends on a series of interesting but theoretically unjustified principles. For example, not only are implicatures claimed to defeat presuppositions, but also clausal implicatures are claimed to defeat scalar implicatures.

and implicature. The same principles that produce implicatures help us decide *where* to accommodate presuppositions. Such an approach forms the basis of the theory of van der Sandt (1992). In his work and its descendants, accommodation constraints are stated in terms of Discourse Representations. However, we can also understand the constraints in terms of explicit addition of presupposed material to the original utterance.

Informativity Principle Do not accommodate in such a way as to make existing parts of the sentence truth-conditionally redundant.¹⁹

For example, consider again (16). Ignoring the non-trivial issue of tense, we have to decide between local accommodation as in (17a) and global accommodation, as in (17b).

- (17) a. If I can't make it and I realize that I can't make it, I'll need you to go on without me.
 b. # I can't make it, and if I realize that I can't make it, I'll need you to go on without me.
 c. # I can't make it, and if $1 + 1 = 2$, I'll need you to go on without me.
 d. I can't make it, and I'll need you to go on without me.

Example (17b), the global accommodation reading, is odd because once our heroine has asserted that she cannot make it, the question of whether she realizes that she cannot is settled. Thus the antecedent

¹⁹ In van der Sandt's statement of the accommodation constraints, the Informativity Principle corresponds to several different principles, all of which are requirements on DRSs. Beaver (2001) reformulates these principles so as to solve some minor technical problems, resulting in the following formulation:

Update Informativity If some DRS K is incremented with information from a new sentence, such that after resolution of all presuppositions the new DRS is K' , then $K \not\models K'$

Local Informativity No sub-DRS is redundant. Formally, if K is the complete DRS structure and K' is an arbitrarily deeply embedded sub-DRS, K' is redundant if and only if for all admissible models M and all embeddings f , $(M, f \models K \rightarrow M, f \models K[K'/\top])$. Here $K[K'/\top]$ is a DRS like K except for having the instance of K' replaced by an instance of an empty DRS, and \models denotes the DRT notion of *embedding*.

Local Consistency No sub-DRS is inconsistent. Suppose K is the complete DRS structure and K' is an arbitrarily deeply embedded non-tautological sub-DRS. Then K' is locally inconsistent if and only if its negation would be *redundant* (in the sense above) were it to replace K' .

of the conditional in (17b) is redundant — we could replace it with any other true sentence, e.g. as in (17c), without changing the truth-conditional import of the utterance. Thus the informativity principle mitigates against global accommodation, and predicts that instead local accommodation must occur. So (16) is correctly predicted to convey the message in (17b).

The Informativity Principle seems at first blush to relate to Grice’s *Maxim of Quantity*: “Make your contribution as informative as is required for the current purposes of the exchange. . . . Do not make your contribution more informative than required.” However, Quantity is normally taken to concern utterances of complete sentences, not sub-parts of sentences. There is no obvious sense in which utterances of (16) are likely to satisfy Quantity any better than utterances of (17b). Grice’s “Be Brief”, a sub-clause of his *Maxim of Manner*, captures the spirit of The Informativity Principle better: a sentence with a truth-conditionally redundant part conveys the same information as would a briefer utterance without that part. So (17a) is odd because it conveys the same information as the briefer (17d), which is just another way of saying that the antecedent of the conditional is redundant in (17a) and (17c).

We can see that in cases traditionally thought of as involving presupposition cancellation, Gricean principles are not in competition with presuppositions but with the globality preference, or whatever principle we take ordinarily to favor global accommodation over local accommodation. Yet the Atlas principle may itself be thought of as a special case of Grice’s *Quantity* maxim, so apparent cases of presupposition cancellation would be reanalyzed as the result of interactions between different conversational principles. However, the above discussion seems to imply that to analyze accommodation correctly in (16), the Maxim of Manner needs to trump an (unusual) application of the Maxim of Quantity. We leave as an open lines of inquiry whether Quantity really explains the preference for global accommodation, whether Manner generally beats Quantity, and, if so, why it should.

We would also note that there is no special reason why Manner and Quantity should be the main maxims that come into play when considering accommodation options. For example, consider the preference for global accommodation in (18), yielding the effect of (18a). Could this be explained not by a general preference for strength, but simply because both the intermediate and local accommodation options, in (18b) and (18d) respectively, yield slightly odd texts? It is quite hard to imagine a context of utterance in which (18c) and (18d) would satisfy Grice’s *Maxim of Relevance* (“Be relevant!”).

- (18) If Mary is smart then her ex-husband will get nothing.
- a. Mary has an ex-husband. If Mary is smart then her ex-husband will get nothing.
 - b. # If Mary has an ex-husband and is smart then her ex-husband will get nothing.
 - c. # If Mary is smart then she has an ex-husband and her ex-husband will get nothing.

2.5. MULTIPLE ACCOMMODATION

As discussed by Zeevat (1992) and Beaver (1997, 2001), there are two strategies for accommodation within representational approaches to interpretation. In the first approach, which is standard within DRT accounts van der Sandt (1992), Geurts (1999), Kamp (2001a, 2001b), presuppositions are moved from the site of the trigger to a distant but anaphorically accessible site. Corresponding to each trigger there is one and only one site of accommodation. The second approach is found in the work of Fauconnier (1985), and, as argued by Zeevat (1992), is implicit in the theory of Heim (1983). This approach involves accommodation in multiple contexts, as if information that is needed to satisfy the presupposition is first added to the local context, and then spreads outwards, being copied into successively more global contexts until some barrier prevents further expansion.

For extensional contexts, as created by conditionals, truth-conditional negations and other connectives, the choice between the two strategies makes no difference. For example, if a presupposition is triggered in the consequent of a conditional, and is accommodated globally, it makes no truth-conditional difference whether the presupposition is also accommodated in the antecedent and/or consequent of the conditional, at least when the presupposition does not require new discourse markers.²⁰

As discussed by Zeevat (1992), the choice between single and multiple accommodation can make a great difference when intensional contexts are involved. For example, consider (19), which involves the presupposition that it is raining triggered by *stop*, and let us suppose that the presupposition is globally accommodated. On the single

²⁰ If accommodation does require addition of new discourse markers, the question of whether additional accommodation makes a difference rests on the way in which discourse markers are interpreted. according to the semantics of Heim (1983) and Kamp (1981), re-introduction of discourse markers in extensional contexts has no effect, so this is not a factor in the above discussion of the difference between single and multiple accommodation.

accommodation analysis, that is the end of the story, yielding an interpretation like in (19a). But on the multiple accommodation analysis, we should also add the presupposition within the belief context, producing the meaning in (19b). (19a) and (19b) are truth-conditionally distinct. In this case the multiple accommodation strategy in (19b) appears to produce better results.²¹

- (19) Mary thinks it unlikely that it will stop raining.
- a. It is raining and Mary thinks it unlikely that it will stop.
 - b. It is raining and Mary thinks it is raining and unlikely that it is raining and will stop.

Zeevat (1992) argues that in other cases, single accommodation performs better than multiple accommodation. To take an extreme example, consider (20), involving a scalar presupposition triggered by *even* within a Scrooge's mother's belief context. Here, the single accommodation reading (a) seems much more plausible than the multiple accommodation reading (b).

- (20) Scrooge's mother —who thinks the world of him— believed even he was generous.
- (21)
- a. Scrooge was a relatively difficult person to class as generous and his mother believed that he was generous.
 - b. Scrooge was a relatively difficult person to class as generous and his mother believed that he was a relatively difficult person to class as generous and that he was generous.

The two cases above, (19) and (20) involve embedding of triggers under a single occurrence of a belief operator. This leads to two further questions: what happens with embeddings under multiple belief operators, and what happens with other attitude verbs?

As regards multiple belief operators, the data quickly becomes unclear as the sentence complexity increases. In spite of this, we suggest that after hearing (22) it would be natural to conclude that all of the speaker, Mary and John think it is raining. Of course, it could be argued

²¹ It might be felt that the preferred reading of (19) involves accommodation in the global context and within the attitude context, but not in the scope of *unlikely*. The reading would then be: *It is raining and Mary thinks it is raining and unlikely that it will stop*. Whether this reading is equivalent to (19b) depends on how the semantics of attitude contexts interact with those for *unlikely*, which is not a topic we can discuss in detail here.

that the reason for this is not that multiple accommodation takes place, but that accommodation takes place in the common ground shared by individuals including not only the speaker and addressee, but also John and Mary.

(22) Mary is certain that John thinks it will stop raining.

For attitudes other than belief, we find that while multiple accommodation is needed, it is not multiple accommodation in the form described above. Consider the following examples, which are related to data Zeevat (1992) uses to argue for differences between different types of presupposition triggers:

(23) Mary hopes that it will stop raining.

(24) Mary doubts that it will stop raining.

(25) Mary doesn't doubt that it will stop raining.

According to the single accommodation strategy, there would be no requirement for Mary to hope or believe that it is raining: this prediction is clearly incorrect. According to the above multiple accommodation strategy, (23) should mean that the speaker believes (it is common ground that) it is raining, and Mary hopes that it is raining and will stop. This is also wrong. What we in fact want is to accommodate that Mary believes that it is raining, not that she hopes it is raining.

What (23) suggests is that both the speaker and Mary believe that it is raining, and that Mary hopes it will stop. Similarly, (24) does not indicate that Mary doubts it is raining, but that she believes it is raining, and doubts that it will stop. In other words, we might best describe what we see in cases of presuppositions under attitude verbs not in terms of a combination of global accommodation and local accommodation within the attitude, but in terms of multiple global accommodation. Thus these would be cases of global accommodation that the speaker takes the presupposition to be common ground, combined with further global accommodation that the agent of the attitude shares the given presupposition.²² Note that an argument based on the plausibility of multiple global accommodation could be used to explain why in (20) we appear not to get accommodation under the attitude

²² It was Karttunen (1974) who first suggested a mechanism by which presuppositions triggered within belief contexts could be transformed into presuppositions which themselves involve belief operators. This strategy is among those considered by Heim (1992).

verb: it is explicitly denied in a parenthetical non-restrictive relative clause that Scrooge's mother shares our common ground.²³

If single accommodation is preferred for some triggers, and multiple accommodation is preferred for others, this presumably reflects differences in the presuppositional requirements imposed by those triggers. Zeevat (1992) thus suggests using this sort of difference as the basis of a classification of trigger types. However, as regards some triggers for which single accommodation produces better results than multiple accommodation, the discussion to follow in section 3 casts doubt on whether there is any accommodation at all.

2.6. INFORMATION STRUCTURE AS A CONSTRAINT ON ACCOMMODATION

Strawson (1964) suggested, in effect, that a definite description is presuppositional when it is part of the sentence topic, but not when it is focused. Though Strawson was naive as to English information structure, he presented examples in which focused definite descriptions (*the King of France*, naturally) failed to carry their standard presupposition. Strawson suggested that while Russell's (1905) classic (26) fails to have a truth value if there is no King of France, (27) may simply be false when the question of who visited some particular exhibition is under discussion.

(26) The King of France is bald.

(27) The Exhibition was visited yesterday by the King of France.

Hajičová (1984) (see also Partee (1996) and Hajičová et al. (1998)) presented examples showing an impressively clear interaction between information structure and presupposition:

(28) Our victory wasn't caused by [Harry]f. (*Victory projected*)

(29) Harry didn't cause our [victory]f. (*Victory can be suspended*)

Partee (1996) presents an interesting alternative view on such examples: perhaps the focussed items still carry their presupposition, but the location in which the presupposition is accommodated is dependent on information structure. Rather than detailing Partee's account, let us observe that examples like Hajičová's might be accounted for by

²³ For further discussion of single vs. multiple accommodation of presuppositions triggered in attitude contexts, see Heim (1992) and the counterarguments in Geurts (1998).

either of the following principles, as well as variants which we leave to the reader's imagination:²⁴

Topic Principle Presuppositions which are marked as given must be globally accommodated or anaphorically resolved.

Focus Principle Presuppositions which are intonationally marked as new information may not be globally accommodated.

In the case of (28), *our victory* occurs in a topical position, so the Topic Principle would force the victory to be established globally. The Focus Principle would not force the victory to be established globally, but an independent principle such as the Generalized Globality Principle would force this. For (29) *our victory* is focused. Thus the Focus Principle would force local accommodation, so that the sentence would not imply any victory. The Topic Principle allows but does not force local accommodation in this case, and so local accommodation would only be predicted if some additional factor, such as the threat of global inconsistency, prevented global accommodation.

It is worth noting that both the Topic Principle and the Focus Principle would require extra assumptions in order to predict a difference between Russell's (26) and Strawson's (27), since these examples do not involve any local context in which local accommodation could occur. One way to make the principles work in these cases would be to posit that entire sentences are interpreted within the scope of an *assert* operator. Then by the Topic Principle, (26) would require accommodation into the global context (which we might equate with the common ground) that there is a King of France, which would presumably fail, producing infelicity. On the other hand, the same principle would allow that (27) was interpreted as asserting that there is a King of France, a false assertion, but not a source of such marked infelicity.²⁵ The interaction between presupposition accommodation and other aspects of information structure remains an open area for further investigation.

²⁴ Relatedly, Beaver (2004) observes that classic cases of cancellation involving factive (or so-called *semi-factive*) verbs discussed by Karttunen (1971) and Stalnaker (1974) are also affected by information structure in a way not accounted for by current accounts of presupposition. A comparable observation is made by Delin (1995) for the case of *it*-clefts: global accommodation of the cleft presupposition is only possible if there is an accent in the cleft complement.

²⁵ For recent discussion of Strawson's arguments, see von Stechow (2006).

3. A Puzzle: Missing Accommodation

3.1. TRIGGERS THAT DO NOT ACCOMMODATE

Accommodation fills a gap, occurring because something is missing from the context: this is the intuition present in all the literature since Lewis (1979). This leads us to a prediction. Start with a presuppositional utterance in a context which satisfies the presupposition, then alter the context so the presupposition is no longer satisfied. *Ceteris paribus* accommodation should (paraphrasing Lewis) cause the presupposition to spring into existence, repairing the context and filling in whatever was missing. We shall now consider cases in which this prediction is incorrect.

To start with, demonstratives, pronouns, short definite descriptions and names all seem to allow more limited possibilities for accommodation than do the triggers Lewis (1979) considered. Pronouns are the classic case; they come with an obligation of being resolved to an entity that is highly activated at that point in the discourse. If someone uttered (30) as the first exchange in a conversation, and the non-linguistic context did not contain a highly salient male person, the addressee would be confused.

(30) He is very cute.

The pattern is the same for a subclass of definite descriptions, demonstrative NPs and certain names. The exceptions are long definite descriptions (where the descriptive content suffices to uniquely single out the unknown referent, as in Russell's *the author of Waverley* or *the king of France*) and long names (possibly including appositions, as in *my brother John* or *Peter Flemming, the brother of Ian*). In other cases, there is the requirement that the referent has been introduced before or that there is bridging to salient entity, or *subsectional* anaphora in the sense of van Deemter (1992) (reference to an element or part of a plural entity or group). But bridging and subsectional anaphora place comparable conditions on context as do other types of anaphora: they need a highly salient antecedent from which they build a bridge to the referent, or from which they take a subset. For subsectional anaphora, the new description uniquely identifies its referent as the maximal subset of the antecedent that meets the description. When there is no object to build a plausible bridge from, no object from which a subsection could be taken, the descriptive material by itself is not sufficient to guarantee unique reference, and there is no relevant entity available for deictic reference in the utterance context, the trigger NP is not interpretable.

Demonstrative NPs in English have a variety of functions, including the indexical use in which identification of the referent requires a demonstration by the speaker. Here we may say that the use of the demonstrative presupposes the demonstration by the speaker. If no such demonstration occurs, infelicity results: the hearer cannot simply accommodate a referent.²⁶ Names refer in virtue of the fact that there is the social fact that people and other entities can bear names. But the fact that there are bearers of the name *Tom* is not always enough for a reference to one of them by a use of *Tom*. The referent must have higher salience than others of the same name in order for the interlocutors for the reference to be successful.²⁷

Further cases where accommodation fails include the following:

- (31) Another man came in.
- (32) John is having dinner in New York too.
- (33) John is indeed having dinner in New York.

The trigger *another N* requires another N, *too* requires that somebody else is having dinner in New York, and *indeed P* has a condition the suggestion that *P* holds is previously salient although *P* is not yet in the common ground. In all of these cases, the repair view of accommodation seems misguided. Kripke (ms) points out that many people have dinner in New York every night, yet this fact does not mean that (32) can be used out of the blue. Neither does it mean that it is easy for us to accommodate an antecedent, some particular person other than John who is having dinner in New York. That is not how these triggers are used: they require proper antecedents in the context, and when such antecedents are there the triggers are close to obligatory.²⁸

The class of politeness markers is another one for which accommodation is the exception rather than the rule. The French *tu* presupposes that the speaker is familiar with the addressee, the Dutch pronoun *U* that the addressee deserves respect or is unfamiliar. These politeness presuppositions are not part of the content of the sentence

²⁶ For a recent treatment of the presuppositions of demonstratives, see Roberts (2002).

²⁷ The Kamp and Reyle (1993) non-presuppositional development rule for names is thus problematic. It forces a new discourse referent and makes the (descriptively inadequate) assumption in the model theory that names have a unique bearer. The rule is essentially correct for long names at first mention. It is inadequate for second mention and short ambiguous names.

²⁸ For a longer discussion, see Zeevat (2002).

and it is problematic to say that hearers accommodate. The social relations on which the use of polite forms depends are not hard facts and the choice of the forms in question can be instrumental in changing them. But it would be incorrect to say that speakers just repair when confronted with a special form: they may feel quite unhappy when respect and unfamiliarity is not recognized or perhaps even worse when distance is created by the use of an inappropriate polite form. Thus, while languages and cultures vary in the rigidity of their politeness and honorific systems, it is standardly the case that use of a certain form will not in and of itself produce accommodation by interlocutors to ensure that the form is in fact socially appropriate.

Yet another case where accommodation is highly constrained, and often impossible, is the intonational marking of focus. This is most obvious in examples like (34) which unambiguously involve *narrow* focus, i.e. focus on a word or small constituent rather than on an entire verb phrase or clause. (34) requires not only that it is established that Mary ate some sort of sandwich, but also that it is directly relevant to issues raised in the prior discourse what type of sandwich Mary ate. In case this relevance is not obvious, the utterance is infelicitous. The hearer cannot simply accommodate that Mary ate a sandwich and that it is in some unspecified way relevant what sort of sandwich she ate.²⁹

(34) Mary ate a [ham]_F sandwich.

Consider the set of presupposition triggers other than short definites, politeness markers, discourse functional markers and intonation: what remains is a heterogeneous collection, united by little more than the fact that all members involve open-class lexical items and trigger accommodation readily. The collection includes factives (*realize; regret*), Karttunen's (1971) implicatives (*manage*), Fillmore's (1971) verbs of judging (*accuse, praise for*), aspectual verbs (*stop; continue*) and sortally restricted predicates of various categories (*bachelor*, presupposing marriageable male; *happy*, presupposing sentient), clefts, pseudo-clefts, long definite descriptions and long names.

Although all members of this grab-bag of remaining triggers produce accommodation, even here there are awkward cases not handled by existing theories. For example, consider Klein's (1975) observation that the subject's belief is sufficient to satisfy the presuppositions of an emotive factive. Thus (35) is felicitous, even though the factive complement (that Jane's friend had Jane's keys) need not be satisfied globally.

²⁹ Schwarzschild (1999) provides the most explicit formalization of the requirements that utterances of examples like (34) place on context. A recent discussion of the existential nature of focal presuppositions, and the limits on accommodation of such presuppositions, is given by Geurts and van der Sandt (2004).

- (35) Jane's keys were sitting in her bag. However, she believed her friend had them, and she regretted that her friend had them.

On the basis of this observation, and the fact that factives in general do allow for accommodation, we should expect emotive factives to allow for accommodation concerning their subject's belief state. However, this prediction is not born out. We do not usually accommodate the subject's belief alone, even when this is the only possibility:

- (36) ? Jane's keys were sitting in her bag. However, she regretted that her friend had them.

No current theory explains why we cannot accommodate "she believed her friend had them." in (36). Note, however that the solution to this problem may be distinct to that for the earlier cases of missing accommodation. The solution may be linked to the broader issue of presuppositions triggered within belief contexts, as discussed by Heim (1992). For a similar absence of accommodation is observed in (38). Here the presupposition that it is raining is triggered within a report of Jane's beliefs. A comparable text (37) in which it is made explicit that Jane thinks it is raining is felicitous. So we might expect (38) to be similarly felicitous, requiring only accommodation of the proposition that Jane thinks it is raining. The fact that (38) is infelicitous indicates that such accommodation does not occur. It seems that all such attitudinal cases might be profitably related to the discussion of multiple global accommodation of beliefs discussed in section 2.5, but we leave this as yet another open line of inquiry.

- (37) It isn't raining, but Jane thinks it is, and thinks Bill realizes that it is.

- (38) ? It isn't raining, but Jane thinks Bill realizes that it is.

3.2. EXPLANATIONS OF MISSING ACCOMMODATION

We will now discuss two accounts that have been offered for missing accommodation in the non-attitudinal cases, and then speculate on a further line of research.

Van der Sandt (1992) and Geurts and van der Sandt (2004) operate under the principle "presupposition is anaphora", or sometimes the reverse.³⁰ As already noted, antecedents for pronouns generally cannot

³⁰ Van der Sandt (1992) does not define presupposition as anaphora, but "presupposition projection as anaphora resolution." Geurts and van der Sandt (2004)

be accommodated, whereas antecedents for factives and long definites typically can be. It is crucial to the plausibility of van der Sandt's and Geurt's theory that they account for the fact that the paradigmatic case of an anaphoric form behaves quite differently from paradigmatic presupposition triggers. Their solution (Geurts and van der Sandt 2001, 2004) has been to suggest that pronouns unlike descriptions do not accommodate because they have too little descriptive content. We can enshrine this idea in a general principle:

The Insufficient Content Principle Accommodation is only possible when the presupposition is descriptively rich. If a low content presupposition cannot be resolved, infelicity results.

To the extent that we define “descriptively rich” not to include pronouns and short definites like *the man*, this principle seems reasonable. However, there are problems, as we will see. First, there is a problem of motivation. Second, although the Principle has been used as an explanation for non-accommodation of discourse functional triggers like *too*, it fails for these cases. Third, the Principle has nothing to say about other cases of missing accommodation, such as politeness presuppositions, long demonstratives or belief presuppositions of emotive factives. We will now expand a little on the issue of motivation, before turning to empirical problems.

Consider first how the principle could be motivated. Are presuppositions perhaps rocket-ships powered by their descriptive material, so that if the tank is empty, the presupposition never leaves the launch pad? Lacking any such story, the obvious question is why the insufficient content principle should hold and not a completely opposed principle. Accommodation, after all, is sometimes seen as a repair on a faulty discourse representation, and surely it should be easier to make a minor repair than a major one. The more descriptive content is present in the presupposition, the larger the repair. Hence it would be easy to justify on intuitive grounds the opposite of the Insufficient Content Principle, the descriptively false hypothesis that overly rich presuppositions cannot be accommodated. Given the equal plausibility of its converse, the Insufficient Content Principle is at best an interesting observation, not yet an explanation.

As regards empirical short-comings, the fact is that the Insufficient Content Principle, as stated, explains very few of the cases of missing

describe their theory of presupposition as an “anaphoric binding theory”, and say that “pronominal anaphora is a species of presupposition.” Geurts (1999) also takes “anaphora to be a special case of presupposition.” Catchy variants of “presupposition(s) is/as/are anaphor(a/s)” have been used in numerous talks and papers, some having been popularized, or de-popularized, by Bosch (2001).

accommodation discussed in sections 3.1 – 3.3. Many of the triggers involved have quite elaborate descriptive contents but still do not accommodate. Consider discourse functional triggers like *too*, for which van der Sandt and Geurts have claimed explicitly that lack of content explains lack of accommodation.

It seems at first blush surprising that anyone would even attempt to apply such a principle in the case of *too*, since the presuppositions associated with *too* generally have such high content. For example in (32), repeated below, *too* is associated with a presupposition that involves having dinner in New York, an act which, while common-place for many, is not content-free. Given the apparently non-trivial content associated with the standard presupposition, van der Sandt and Geurts are forced to claim that *too* is associated with an additional low-content presupposition. They propose that (32) carries first a presupposition that some individual (other than Bill) is salient, and second a presupposition that the salient individual is having dinner in New York. Thus (ignoring the inequality between Bill and the other salient individual) we can gloss the proposed analysis of (32) as in (39).

(32) Bill is having dinner in New York too.

(39) It is known that (s)he is having dinner in New York, and Bill is having dinner in New York.

Given that *too* supposedly carries deep in its bowels the presuppositions of a pronoun, and given that pronouns do not trigger accommodation, van der Sandt and Geurts are able to derive that *too* does not trigger accommodation either. However, there is a serious problem with their analysis (as was first pointed out, we believe, by Nick Asher): in case there is a salient individual, but the other presuppositions of *too* are not met, van der Sandt and Geurts provide no mechanism to block accommodation. Consider (40), in which Jane is salient although not established to be having dinner in New York. Van der Sandt and Geurts predict that the internal pronoun-like presupposition will simply resolve to Jane. We are then left with the remaining presupposition that the salient individual is known to be having dinner in New York. In the absence of any further, as yet unspecified constraints on accommodation, the account of van der Sandt and Geurts is quite clear about what should happen: this presupposition will be accommodated. So (40) is incorrectly predicted to be perfectly felicitous, and to imply that Jane is having dinner in New York. It seems that two things must normally be salient for a felicitous utterance of (32), both an entity other than Bill and the proposition that the entity is having dinner in New York.

- (40) ? Jane likes Bill. Bill is having dinner in New York too. (*In the absence of further relevant context.*)

Another principle that might explain missing accommodation, and which makes correct predictions for a larger set of phenomena than the Insufficient Content Principle, is what Zeevat (2002) terms Blutner's Theorem.

Blutner's Theorem If a presupposition trigger has simple expression alternatives that do not presuppose, the trigger does not accommodate.

Blutner's Theorem is based on bidirectional Optimality Theory (Blutner, 2000), an extension to standard (unidirectional) Optimality Theory (Prince and Smolensky, 1993). In unidirectional Optimality Theory as applied to the syntax-semantics interface, production is understood as an optimization in which alternative expressions for a given meaning are compared, and an optimal expression is chosen relative to various competing grammatical constraints. For example, "sang Mary" is ruled out because "Mary sang" better satisfies the constraints of English. Blutner's bidirectional version involves simultaneously checking that the expression is a better realization of the intended meaning than are alternative expressions, and that the expression would optimally be interpreted as having the original meaning. For example, suppose that "she sang" is in unidirectional production the optimal way of realizing the proposition that Mary sang. "She sang" could still be ruled out as an expression of this proposition if it would be misunderstood, say because Mary is not salient in the particular context of utterance.

To derive Blutner's theorem within the reconstruction of presupposition theory by Blutner and Jäger (2003) in bidirectional OT, a constraint *Do Not Accommodate* is used. Arguably, this constraint is less *ad hoc* than the Insufficient Content Principle in as much as it applies equally to every trigger. Since all constraints in the Blutner/Jaeger model are soft, there will still be cases when accommodation occurs. The crucial cases are those where two expression alternatives are available which are equally good with respect to basic grammatical constraints, but differ in that one carries a presupposition and the other does not. Suppose that the presupposition is already in the common ground of the interlocutors. In that case, the presuppositional form may be preferred, e.g. because it enhances textual coherence, which would presumably be reflected by another constraint. However, if the presupposition is not in the common ground of the interlocutors, then using the presuppositional form would force accommodation, and thus be sub-optimal in interpretation. For this reason, non-presuppositional

forms are predicted to be preferred over presuppositional forms whenever they are equally acceptable with respect to other constraints but the presupposition would need to be accommodated, hence Blutner's Theorem.

Blutner, in unpublished work, originally explained the difficulty of accommodating of intonationally marked topics in this way, where the other candidates are plausibly given by variation in the intonation. Zeevat (2002) generalizes the explanation to all presupposition triggers and uses the generalization to explain the non-accommodation of discourse functional markers where the alternative is obtained by just omitting the marker.³¹

In the case of Blutner's Theorem, there is a strong theoretical motivation. The principle also makes correct predictions for *too*, and, under certain assumptions, for some other non-accommodating triggers. For example, Blutner's Theorem would predict that politeness presuppositions would not be accommodable provided there was a competing form which was unmarked for politeness. There are, however, empirical shortcomings. For example, *finish* and *manage* are potential counterexamples: their presuppositions accommodate easily, but they can be omitted to obtain suitable alternative candidates that do not trigger presuppositions.³² Perhaps even more problematic for current applications of Blutner's Theorem is its close tie to bidirectional Optimality Theory which comes with a host of technical problems beyond the scope of the current article — see Beaver and Lee (2003) for discussion.

The two current accounts of missing accommodation, the van der Sandt/Geurts account using Insufficient Content and Blutner's Theorem, are interesting descriptively and theoretically. Ultimately, we must seek a theory of missing accommodation that accounts both for when the current accounts work and when they fail. We speculate that progress might be made by sharpening Lewis' original conception of accommodation, and considering the function of accommodation in terms of common ground.

³¹ A related approach to non-accommodation of discourse functional markers is presented by Zeevat (2003).

³² It is instructive to consider whether lexical presuppositions like *bachelor* may also create problems for Blutner's Theorem. Suppose that *is unmarried* is an expression alternative to *is a bachelor*, and differs only with respect to a presupposition of maleness, and marriagability, then Blutner's theorem predicts that accommodation should not be triggered by *is a bachelor*. But if we only consider lexical nouns as alternatives to *bachelor*, then there is no appropriate non-presuppositional alternative, and accommodation is allowed. Clearly more needs to be said before Blutner's Theorem leads to a general predictive model of missing accommodation.

Let us suppose that accommodation is a process which resolves uncertainty about the common ground.³³ Then, we should expect accommodation to be blocked whenever it would conflict with the common ground. For example, given that the presupposition of *too* resists accommodation, we can hypothesize that its presupposition concerns something that could be in direct conflict with the common ground. An example of something that is in the common ground is the discourse record itself, the history of what has been said. So a natural hypothesis, closely related to the Kripke's suggestions, is that the presupposition of *too* involves information about what is jointly salient to the discourse participants, and that this salience is normally established by virtue of facts about the discourse record.³⁴ If the discourse record satisfies the presupposition, accommodation is unnecessary. But if the discourse record does not satisfy the presupposition, and nothing else establishes the salience of the relevant material, then accommodation is impossible, because accommodation only occurs when there is uncertainty and, by assumption, there is no uncertainty about the discourse record: it is in the common ground already. Therefore, *too* should not trigger accommodation. More generally, we might base an analysis of many cases of missing accommodation on principles like the following, the second being a sub-case of the first:

The Common Ground Principle If a proposition is such that its truth or falsity is a matter of mutual knowledge between discourse

³³ Beaver (2001) provides a formal model of accommodation as resolution of uncertainty about the common ground that could form the basis of an analysis such as the one we suggest here. However, Beaver's original proposal did not incorporate an account of cases of missing accommodation.

³⁴ It might be suggested that the presupposition of *too* is solely concerned with the discourse record, and not with what is salient more generally. However, it is well known that *too* sometimes occurs even when there is no linguistic antecedent. For example, consider the idiom (*Hey*) *X* *have feelings too(!)*, where *X* can be e.g. *men*, *fish* or *we*. A web search revealed 20,000 uses of the idiom, and a causal sample indicates that most have no explicit linguistic antecedent. We posit that in these cases the speaker is assuming that there is some *Y* (e.g. *women*, *people* or *you*) such that *Y* has a uniquely salient contrast with *X* and such that *Y has feelings* is already in the common ground. In this case, no accommodation would be needed. This type of explanation suggests that the analysis of *too* might make use of a notion like Roberts' (2003) *weak familiarity*, a condition she uses in the analysis of definites: it allows that a referent is identifiable but not previously mentioned. An alternative account would be that *too* does indeed have a presupposition that explicitly concerns what has been mentioned in the discourse, and thus that cases where there is no linguistic antecedent involve accommodation after all. However, if we were to allow that *too* can sometimes trigger accommodation, we would be left with no explanation of Kripke's observation that occurrences of *too* without an explicit antecedent are often infelicitous.

participants in normal conversational situations, then the presupposition that the proposition is true (or that it is false) can never be accommodated.

The Discourse Record Principle Presuppositions about what is in the discourse record may not be accommodated.

On this type of analysis, *too* differs from e.g. canonical factives like *realize*, because the presuppositions of *realize* are concerned with whatever propositions or facts are under discussion, and are not intrinsically concerned with the discourse record itself. It remains a matter for future research how such an account can be formalized, and whether it can be extended to other presupposition triggers for which accommodation is missing.

4. Conclusion

Lewis' accommodation might have initially appeared to be all or nothing. Mostly all. That is, the hearer seemed forced to choose between putting up with a defective context, or adding the failed presupposition to it to make things work. Given such a choice, adding the presupposition would be a good bet. This notion of accommodation might not have seemed destined to make a big mark on the theory of presupposition: it only solved one problem, the problem of informative presuppositions.

In the last 25 years, the theory of accommodation has become far more nuanced than Lewis' original conception. Contemporary theories allow (i) that what we accommodate may not be predictable from the form of the presupposition trigger alone, (ii) that we may accommodate not only globally, but in a variety of intermediate and local contexts created during the evaluation of an utterance's meaning, and (iii) that accommodation is a complex form of inference based on a considerations including semantics, general principles of pragmatics, and specific calculations of the (joint) goals of discourse participants. In combination, these advances mean that accommodation is no longer merely an add-on pragmatic component designed to deal with a single special case. Rather, accommodation is at the heart of modern presupposition theory, and has resulted in theories which improve empirically on earlier accounts of presupposition, which are far better motivated than their predecessors, and which extend the reach of those theories to new phenomena like modal subordination. Indeed, it may even be said that accommodation has partially supplanted the *presupposition projection problem* of Langendoen and Savin (1971), the problem of predicting which presuppositions triggered within a complex utterance

would be presuppositions of the utterance as a whole. A restatement of that question would be: given that there are presuppositions in a complex utterance, what is accommodated and in which contexts?

The ideas we have discussed in this chapter suggest that accommodation bears on one of the central issues in the study of how semantics and pragmatics are related, the issue of *pragmatic intrusion*. Pragmatic intrusion concerns cases in which pragmatic inferences affect truth-conditional meaning: a recent case for such effects is made by Levinson (2000).³⁵ It is controversial whether pragmatic intrusion occurs at all, and it has certainly not been shown to be common. However, observe that local and intermediate accommodation as we have defined them are inferential processes governed by pragmatic constraints which can directly influence truth conditions. So if the models discussed in this chapter are correct, then pragmatic intrusion is not merely a marginal phenomenon occurring in special cases, but a common occurrence. For example, whenever we accommodate information necessary for a bridging definite description, and the material is accommodated in a local context, pragmatic intrusion must be occurring. In (41), the material bridging *the music* to *an elevator* is accommodated locally, yet this material is presumably pragmatically derived rather than lexically encoded.

(41) Every time we step in an elevator, the music soothes us.

Pragmatic intrusion is sometimes taken to imply that there really is no sharp division between semantics and pragmatics, yet that is not the view taken here. Rather, we have described models of accommodation in which compositional semantics and pragmatics do discrete tasks, and in which these tasks could even be ordered quite straightforwardly. Specifically, on the view we have described, the interaction of syntax and semantics produces an initial representation which involves unresolved presuppositions, and accommodation then acts on that representation to compute a final representation in which all the

³⁵ A standard type of example of pragmatic intrusion is based on the idea that the temporal asymmetry of *and* (noticed by Strawson 1952) is commonly analyzed as a case of Gricean implicature, and yet can have truth-conditional significance when a conjunction is embedded in a comparative:

- (i) It is marginally more common to get depressed and take drugs than to take drugs and get depressed.

The phenomenon was discussed by Cohen (1971) and Wilson (1975), and has become a central issue in Relevance Theory (Sperber and Wilson, 1984), discussed in particular by Carston (1988). Apart from Levinson (2000), the reader is also referred to Horn (2004). Note that pragmatic intrusion as discussed in the literature is standardly taken to involve conversational implicatures, but many cases might instead be analyzed as conventional implicature, for which see Potts (lume).

presuppositions are resolved. So pragmatic intrusion does not necessarily imply that compositional semantics is indistinguishable from pragmatics. Rather, what it implies is that the output of compositional operations could be a representation that is not yet ready for truth-conditional interpretation. If so, compositional semantics could (but need not) still be understood as an entirely discrete grammatical module, even if it is only after applying pragmatic processes such as accommodation that truth conditions are available.³⁶

There remain a variety of open questions. First, we have presented in the main text of this article, in as general a form as we could, fourteen different principles of accommodation. All have descriptive merit, and most of them seem well motivated. The question must be: which of these principles are merely apt descriptions, and which should be seen as essential and underivable parts of the theory of accommodation. Second, we have observed that as regards accommodation, not all presupposition triggers are equal. As we have indicated, a full account of why sometimes accommodation cannot occur, and why there should be differences between triggers, remains elusive. Third, and related to the second point, most work on accommodation centers on its application to presupposition projection. Enormous progress has been made on the projection problem since it was first set out over 30 years ago. Perhaps we should not merely restate the projection problem, but ask a different question altogether. The outstanding conundrum in presupposition theory is surely what can be called the *trigger problem*: why are there any presuppositions and what are the specific mechanisms that produce them?

Based on the above considerations, we anticipate that scholars interests will shift. Current solutions to the projection problem hinge on broad uniformities in accommodation behavior across triggers. Progress on the trigger problem will require detailed observation of how accommodation varies from trigger to trigger. Indeed, there remains yet a further layer of potential variation which we have not even touched on in this article: variation from language to language. To our knowledge, no examples have been given in the literature evidencing cross-linguistic variation of accommodation strategies. It is quite possible that this lack of evidence results from a failure on the part of semanticists to

³⁶ Note that the picture of accommodation we describe here differs in an important way from that of Gazdar (1979). In Gazdar's model, like Grice's, a hearer's pragmatics need only spring into action after semantics has produced truth conditions. Indeed, semantics was understood as no more and no less than truth conditions. The view we describe allows us to conceive of pragmatic interpretation operating after semantics, but suggests that the output of semantics might be a representation that is not yet ready for truth-conditional interpretation.

search for such variation. But it is also possible that the principles constraining accommodation are universal. This in turn would suggest that these principles have some deep functional motivation, or are in some way intimately related to our general cognitive make-up. Yet the present state of our understanding of accommodation does not provide a firm independent functional or cognitive basis for the principles that govern accommodation. Although some principles can be functionally motivated (say the Atlas Principle preferring stronger readings, or Blutner’s Theorem preventing use of presupposition triggers when a semantically equivalent non-trigger is available), every such principle faces empirical problems. The search for general theoretical principles underlying accommodation must go on, hand in hand with empirical work that proceeds trigger by trigger, context by context, and language by language.

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