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**CENTER FOR THE STUDY
OF LANGUAGE
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Explaining Presupposition Triggers

Summary

This paper proposes three revisions to the standard view on presupposition: the employment of optimality theory for the defaults and preferences, the possi ility of inaccessi le antecedents for presupposition resolution and a fine-grained classification of presupposition triggers ased on the availa ility of expression alternatives and the requirement of the presupposition. The treatment deals with some phenomena that have not een addressed y current presupposition theories.

1.1 Introduction

Traditional theories of presupposition treat the phenomenon of presupposition as a unified whole. They can be described as uniformly characterising the consequences for the interpretation of sentences of a class of lexical items, syntactic constructions and intonational phenomena: the presupposition triggers. There are some minor exceptions: Karttunen (1974) and Karttunen & Peters (1979) discuss the double presupposition of factive attitude verbs. According to their proposal, a trigger like "x is glad that " would presuppose both that the complement is true and that x believes the complement. Stalnaker (1973) notes that the falsity of the presupposition of certain triggers does not result in the loss of truth value of the assertion as such. This happens with triggers like *even* and *too*. According to Stalnaker's view, a sentence containing such particles can be true, even if the presupposition is false, but it will be infelicitous. In the same paper Stalnaker also observes that not all triggers accommodate with the same ease. Van der Sandt (1992) notes in his discussion of anaphoric pronouns that while they should be counted as triggers, they still do not accommodate. Zeevat (1992) makes a distinction between a class of triggers that trigger lexical presupposi-

tions and a class of triggers that are anaphoric, claiming that the first class accommodates as predicted by his reconstruction[1] of Heim (1983) whereas the second class accommodates as Van der Sandt would have it. Gazdar (1979) notes that his generalisation that simplex sentences with a trigger occurrence entail their presuppositions has exceptions. These exceptions are attitude verbs like "be glad that" that in a context as in (1) do not entail the truth of their complement.

(1) John thought that Mary had left him. He was glad she had.

These differences have however not been treated systematically.

Second, while there is a wide range of default-like devices in the different presupposition theories, from the satisfiable incrementation of Gazdar (1979), the mysterious pragmatic strengthening invoked by Karttunen (1974) and Beaver (1995) to the "preferences" of Heim (1983), Van der Sandt (1992) and Geurts (1995), no successful explanation for these preferences and defaults has been offered so far. Third, the treatments are uniformly based on a notion of context for resolution or satisfaction where the content of the context is what the speaker knows (Gazdar (1979)), an information state derived by the previous exchanges Karttunen (1974), Heim (1983), Zeevat (1992), Beaver (1995), the common ground (Stalnaker (1978)) or the old discourse representation structure (Van der Sandt (1992), Geurts (1995), Kamp & Rossdeutscher (1994)). This is a wide range, but it does not include inaccessible presuppositions or antecedents of presupposition triggers, such as suggestions by a third party in the common ground or DRS or a possibility introduced by one of the conversational partners. Yet, these suffice for licensing the use of triggers such as *wh*-questions, clefts, intonationally marked topic and particles such as *too* or *indeed*.

This paper tries to make progress in refining our understanding of presuppositions in these three directions. First, we reduce the preferences and defaults to optimality theory (OT), a theory that has been successfully applied in phonology and syntax, and is currently finding more and more applications in semantics and pragmatics. Our treatment is an extension of Blutner (2000)'s reformulation of Van der Sandt's theory in OT by the two constraints: **Do Not Accommodate** and **Strength**. We add two further (generation) constraints: **Parse Old** and **Parse Other**. The resulting theory is successful in capturing the defaults, in explaining

[1] Under this speculative reconstruction of Heim, accommodating the presupposition means adding it to all contexts surrounding the trigger, until a context is reached where it causes an inconsistency. The accommodation concept of Van der Sandt on the other hand requires only a single addition to the highest context to which it can be consistently added.

the obligatory occurrence of certain triggers and in accounting for the absence of accommodation for a wide range of triggers, including pronouns, *too*, *indeed* and intonationally marked topics. We also develop a general account of the differences between triggers in terms of their semantic requirement.

1.2 The Particle "Too"

The particle *too* is a good starting point for our discussion. (2) is the example in Kripke (MS) to show that (at least some) presupposition triggers must be taken as anaphors to specific information in the context. If we do not make this assumption, given that millions of people dine in New York every evening, the presupposition is trivial, which conflicts with our intuition about the example, which says that it can only be used in certain contexts.

(2) John is having dinner in New York too.

But this example has other interesting properties as well. *Too* is a presupposition trigger that does not accommodate (against most theories of presupposition that predict the general availability of accommodation as an option). If it would accommodate, then —given the millions that have dinner in New York every evening— the occurrence of the particle "too" would again be allowed in all contexts since this accommodation would add only information already true in the context. This again conflicts with the intuition that "too" only occurs in certain contexts.

Second, the antecedent need not be a direct ingredient of the context. It is sufficient that the other person who has dinner in New York is only reported or suggested. E.g. (3)

(3) Harry may well stay in New York for dinner.

provides a good antecedent. Also (4):

(4) Bill believes that Mary will eat in New York.

(4) also illustrates a third property: partial resolution. The antecedent only mentions eating and does not imply that a dinner is involved (a lunch or a quick snack would also do). The process of finding the antecedent adds the additional information that Mary will have dinner, at least according to Bill. This process is one of finding an antecedent that only partly meets the specification and of adapting it to become a full antecedent.

A fourth property of the particle *too* is that it cannot be omitted when it has a suitable occurrence in the context. When it is omitted the total discourse becomes strange, though perhaps not always to the same degree. It can sometimes be replaced by other markers (e.g. *also*)

but the bare version of the sentence is usually not appropriate if the version with *too* is. This is hard to show by just a few examples, one really needs to go through a substantial body of natural text and try to omit the *too*s[2].

All these four properties are unexplained by the best presupposition theories on the market (Heim (1983) and Van der Sandt (1992)). Inacessible antecedents are out, accommodation is allowed without restriction, partial resolution is ruled out in the two formalisations and the theories have nothing to say about the obligatory nature of *too*.

The work of Kamp & Rossdeutscher (1994) on *wieder* (german: again) is interesting in this connection. On the basis of a detailed study of *wieder*, they conclude that accommodation is extremely rare and that partial (and not full) resolution is the case that is most frequently found. In an early presentation of this work, Kamp also tended to the view that there was something seriously wrong with the received view of presupposition. As we shall see, this is not the right conclusion. A theory that omits the possibility of accommodation and has only partial resolution instead will not do as a general theory of presupposition, but, at the same time, the pattern observed for *wieder* is typical for the class of presupposing discourse particles. Like *too*, *wieder* marks that the reported event or state is not the only one of its kind reported or assumed in the context, although *wieder* has the additional content that the other entity is temporally anterior to the reported one. This additional content seems to be responsible for the one difference in their presuppositional behaviour: *wieder* does not take inaccessible antecedents, such as suggestions or possibilities. I come back to this point later on when discussing *immers*.

1.3 Old Material

In order to deal with inaccessible antecedents, it seems necessary to allow propositional and other antecedents that are not in the common ground as such but that are only believed or suggested as possibilities in the common ground. It may be the speaker who believes the presupposition or entertains its possibility, but it may also be the hearer or another person to whom beliefs have been attributed in the common ground. It is also not necessary that the attitude is belief or knowledge. Dreams, presentations of plans, desires and possibilities all seem to provide proper antecedents for at least some triggers.

[2]My student Tim Kliphuis and later myself have carried out an overview of this kind for a series of Dutch particles in the text of Multatuli's Max Havelaar, a famous 19th century Dutch novel.

A corrects his conversation partner B:

(5) B: The king of France is bald.
B:The king of France is not bald, France is a republic.

In her correction, A presupposes that there is a king of France, even though she has not the slightest inclination herself to assent to the statement that there is such a person. The natural solution is to think that the statement A is correcting, representing B's beliefs only and not the common ground, supplies the antecedent.

The following examples illustrate a wider range of contexts that can provide such antecedents.

(6) A: John thinks Mary has gone to Bill's party.
B: Carol has gone there too.

A: John dreamt that his car was stolen.
B: My car was stolen too.

A: John said that he is going to the concert.
B: Bill is going too.

A: John thinks that Mary ate the cake.
B: It was Bill who ate the cake.

A: John suggested that he might come tonight.
B: I will come too.

A: Maybe John will sing tonight.
B: I will sing too.

The possibility of such antecedents[3] (*inaccessible* is borrowed from Discourse Representation Theory) appears to have been neglected in the more formal presupposition literature simply because many of the key triggers in that literature do not seem to allow such antecedents. Definite descriptions, names, factives, and lexical presuppositions prima facie do not take such antecedents at all. Anaphoric pronouns clearly also belong to this group. But questions, many particles (but not *wieder*), clefts and intonationally marked topic typicaly do take other antecedents as well.

[3] I have been unable to spot proper references for the first observations of these weaker antecedents for presupposition triggers, but the observation is not due to me. I believe they came up first in discussing the presuppositions of intonationally marked topic and in discussions around the presupposition of questions, but I have not been able to find references or to find people who knew about them.

The range of attitudes that generate inaccessible antecedents is roughly[4] what Giannakidou (1998) has labelled the veridical contexts: those that do not license negative polarity items. That class can be characterised in a quasi-logical way as the closure of the simple sentences under operators that entail the truth of their arguments (e.g. *and*, *necessary*) but also under such operators as *maybe*, *dream*, *belief* etc. At one point, I thought an independent characterisation could be developed starting from the rather particular semantics for belief sentences I developed in Zeevat (1996). There the discourse markers of belief sentences are discourse markers of the DRS that represents the belief sentence and not of the DRS representing its complement. If this approach could be generalised to the other operators for which it seems plausible, the veridical operators would be just those that put their discourse markers in the context that surrounds them. Negations and quantifiers, on the other hand, block this outward movement of markers. This may be a correct point of view, but as a characterisation it is not worth much: it quite obviously just restates the fact that the complements of these operators generate inaccessible antecedents. It perhaps reflects the intuition that the objects and facts of the veridical contexts are ones that the common ground is committed to in some way or other as possibly relevant, without necessarily being committed to their proper existence.

1.4 Requirements and Anaphora

If we have a sentence S containing a trigger T with a presupposition P, the presupposition P must be resolved or accommodated. If neither is possible (usually because the context entails the negation of the presupposition) the sentence cannot be properly interpreted, does not define a proper update or —in terms of discourse representation theory— the development algorithm gets stuck. Our old information state (or DRS) is preserved, it just did not get updated.

Contrast this with what happens to a proposition p if $p \models q$ and we try to update an information state σ such that $\sigma \models \neg q$ with p. The interpretation is successful, a proper update is possible and the DRT development algorithm does not block. But we obtain an inconsistent information state.

This comparison should suffice to establish that —following Stalnaker and Gazdar (and more recently Geurts)— one cannot say that simple sentences S containing a trigger presupposing P also entail P. If

[4] There is a considerable overlap with the distribution of negative polarity items, but there is not an exact match: e.g. *suggest* in Modern Greek takes negative polarity items. This should not worry us unduly, since there is a lot of variation in the distribution of different negative polarity items, also between languages.

that were true, it would follow that adding S to an information state σ entailing $\neg p$ would result both in undefinedness and the empty information state. What we should rather say —and this insight goes back to Heim— is that the fact that the simple sentence S has a presupposition P explains the intuition that S entails P. After all, for all information states σ that can be updated with S, it holds that $\sigma[S] \models P$. If S just entailed P and S contains no other triggers it would hold for all σ for which $\sigma[S]$ is defined that $\sigma[S] \models P$, which is close to the standard way of defining entailment in update semantics. But it is not entailment, as we saw. The presupposition causes undefinedness in those cases where entailment would cause inconsistency.

Generalising this insight, one arrives at the most basic form of the satisfaction theory of presupposition: the trigger has a semantics which requires the truth of the presupposition for the update with the trigger to be defined at all. But this theory brings problems that are hard to solve. The first is the *locality* problem. It is hard to see why the satisfaction of the requirement should consist in the presupposition appearing in the global context —which it mostly does—, when the requirement only arises in the local context of the trigger. Much energy has been devoted on the explanation of this aspect of the satisfaction theory, with very little result. The second is the *rationality* problem. This is the fact that it is often hard to see why the presupposition is required by the semantics of the trigger. Following fairly standard views, names presuppose the existence of something or somebody bearing that name. Since names are often taken to be directly referential, it is hard to see why the local context should require that there is something or somebody bearing that name: the existence of a referent as such seems sufficient for the semantic contribution of the trigger in the local context. And, third, there is the *identification* problem. The identification of the presupposed material in a higher context does not guarantee that the presupposition is locally satisfied.

We are confronted with the locality problem almost all the time. In (7), the presupposition is required in the scope of the negation. Yet, there is agreement that most of the time it ends up in the context of the sentence itself.

(7) John does not regret that Mary left.

(7) just does not mean (8) in contexts that are not committed to the falsity of *Mary left*.

(8) It is not the case that Mary left and that John regrets that.

The rationality problem is perhaps less controversially illustrated by

Stalnaker's observation that "John left too", just continues to mean what "John left" means, even if nobody else left. As we saw just now, *too* has no nontrivial semantical properties other than presupposing some other event of the same type (under compositional semantics we would have to represent its semantic content as the identity function over type t or et).

And the identification problem is perhaps best illustrated by considering propositional attitudes.

(9) John believed that Mary regretted that Bill left.

(9) presupposes that Bill left —normally. But the fact that Bill left is no guarantee that Mary believes that and so does not guarantee that the presupposition of *regret* is satisfied where it matters, i.e. locally, in the scope of the belief operator.

These problems merely underpin the thesis that it does not suffice to say that the presupposition is given by the requirement of the semantic content of the trigger. I want to make a still stronger claim: I want to deny that the requirement is the presupposition. What I want to say is that sometimes it is, that sometimes the requirement is only a part of the presupposition and that sometimes there is no requirement at all. For this we need to make some assumptions about the semantic role of different categories of triggers.

I take it that in natural language we sometimes find the situation that a predicate only applies to an arrangement of entities that already meets certain conditions. One can make an analogy here with the preconditions of certain actions. For example, it is not possible to post a letter before it is written and it is not possible to write a letter if one does not have a pen or a pencil and paper. In much the same way, one can say only of an adult male that he is a bachelor. This fact plays an important role in our interpretation of sentences containing the word *bachelor*. If we say (10) about a four-year old

(10) Tommy is a bachelor.

it will be interpreted metaphorically. Tommy wants to walk to kindergarten with a different girl every day, maybe. The same happens if we say (11) about an 18-year old girl:

(11) Susanna is a bachelor.

Here we may refer to her general lifestyle, or the state of her apartment. And Seuren (1988) observes that lexical presuppositions play a role in disambiguation. *A bald tyre* (unlike dutch: *een kale band*, french: *un pneu chauve*) describes a tyre that has lost its profile, whereas a treeless mountain in Dutch (but not in English or French) can be called *een*

kale berg (french: **une montagne chauve*, english: **a bald mountain*). Apparently the word *kaal* has a different set of presuppositions evoking different concepts than *bald* has. And the different readings are selected by presupposition satisfaction. (And it is very likely that the metaphorical interpretations due to presupposition violation are responsible for the emergence of different specialised concepts expressed by the word.)

Lexical items that have such requirements become presupposition triggers presupposing precisely the requirement. The process of resolution and accommodation is how they manage to meet the requirements. This is characteristic for what are normally called lexical presupposition triggers.

The other triggers are different. Referential devices such as names, pronouns, definite descriptions, demonstratives and others supply referents for predications. The way in which they do that is by searching the context by a variety of criteria. These criteria are their presuppositions and it is by no means clear that the role these referring expressions play in defining the thought expressed by the sentence in which they occur depends much on the content of their presuppositions. Kaplan (1989) is largely devoted to showing that many of these expressions are directly referential and that their descriptive meaning serves only to fix the reference and does not enter the proposition they express. Zeevat (2000 to appear) generalises this to all of the referential devices mentioned, with the possible exception of some uses of definite descriptions. Indeed, it might be argued that these expressions do not have any part of their presupposition as a requirement: the existence presuppositions standardly assumed for them can be attributed (as lexical presuppositions) to the predicates whose argument places they fill. This, however, is problematic.

(12) a. Russell and Strawson argued about the king of France.
b. Russell and Strawson argued about the father of Jane.

While in the first case of (12) the existence presupposition does not emerge as a presupposition of the sentence as a whole, in the second case, in the absence of information that Jane does not exist or that she is fatherless, we standardly assume the existence of the object. Since the predicate *argue about* does not presuppose the existence of its object, we cannot explain the presupposition of (12b.) in this way. It thus seems that we must assume that existence of the referent is required for referential expressions and explain it as a precondition for a referential expression fulfilling its semantic role. Typically, the varied conditions by which these expressions search the context are not required for their semantic contribution. Indeed, in the case of pronouns, deicticals and

demonstratives, these conditions do not seem much like contents at all: they refer to the position of the referent in the context (recent mention, position in the visual field, role in the conversation) and do not give any inherent characterisation of the object.

It is again clear that the presupposition resolution and accommodation process is the means by which the referential expressions fulfill their requirement. But it would be wrong to assume right away that that is why they are presupposition triggers. It is rather the other way around: these expressions' primary function is to collect old and given material from the context in order to say new things about it. They are primarily anaphors and it is because they are anaphors that they have presuppositions and the existence requirement. This category can be described as the referential anaphoric presupposition triggers.

The final category comprises particles and intonationally marked topics. It is usually the case that the particle or the intonation does not make a contribution to the truth conditions of the sentence in which it occurs. With a different intonation or without the particle the sentence means much the same. It follows that the trigger places no requirement on the context. The particles are anaphoric devices and basically position the sentence in the context. I propose to call this category of triggers the non-referential anaphoric triggers.

The following table draws some concrete conclusions from the abstract considerations above.

trigger	**presupposition**	**requirement**
$bachelor(x)$	$adult(x) \wedge male(x)$	idem
he	$salient(x)$	x
the king	$king(x)$	x
John	$named(x, john)$	x
$regret(x, p)$	p	$believe(x, p)$
$know(x, p)$	p	$p \wedge believe(x, p)$
$too(e)$	$e', e' \neq e$	none
$again(s)$	$s', s' < s$	s'

What we said is still problematic. If we think in terms of the DRT development algorithm, any failure of both resolution and accommodation for a presupposition will throw the algorithm into a dead-end street. The difference with the pure satisfaction theory is that we can in some cases unblock the algorithm and end up with an interpretation after all, i.e. when the requirements are still met. In the case the presupposition overlaps with the requirement this does not do: deblocking the algorithm after presupposition failure does not do any good: the inter-

pretation results in garbage. A version of the algorithm which —perhaps after sending an error message— gives up on the resolution or accommodation and continues with its other work will fail because of failing the requirements only. This explains Stalnaker's observation about *even* and *also*.

It is my view that requirements are fully given by the presupposition and the semantic content of a trigger. The requirement of the trigger is what the presupposition has to contribute to the semantics of the trigger for it to carry out its semantic role. I have tried to argue the point that there is no other way in which the trigger's semantics can obtain that contribution: entailment is just something else. It may be confusing because we are not used to thinking about the semantic role of e.g. *know* or *John* without the contribution that their presuppositions make. But that is precisely the point: when the requirement is not fulfilled by resolving or accommodating the presupposition, there is no semantic role. The semantics of triggers can be analysed only by taking them seriously as triggers. And in that sense, but in that sense alone, indicating the trigger's requirement is a task of the lexicographer.

The difference between presupposition and requirement explains the different behaviour of triggers with respect to inaccessible antecedents. An inaccessible antecedent is fine if its existence and identification suffices for meeting the requirement of the trigger in its local context. This happens standardly with triggers that lack requirements. An interesting case arises when the requirement is strictly weaker than the presupposition. Some inaccessible antecedents are then allowed, but not all of them. Compare (13).

(13) John believes that p and he regrets that p.

Here a resolution to an inaccessible antecedent occurs and the requirement is met. But we do not predict that accommodation of *John believes that p* to *John regrets that p*

John believes that are0ext.142TD(p)TlTf15(a)Tj76.99990T590TDt.1491.2(equiremen)]TJ470.

(16) In the 18th century, some astronomers assumed the existence of a planet Vulcan within the orbit of Mercury and Bill now thinks he has discovered evidence that Vulcan is really there.

The inaccessible antecedent for Vulcan is sufficient for meeting the requirement in the second context if we take it that the assumption of the planet (and possibly of its name) is part of Bill's beliefs. The existence of the planet is part of the requirement and is therefore locally entailed by the occurrence of the name. It is, however, not the kind of entailment that comes from conceptual relations, like the relation between *bachelor* and *unmarried*. It is a presupposition of the expression fulfilling its semantic role, in this case providing a referent for a predication. If the local existence of Vulcan is not given, the

suppose another element of the same kind in the context. The sentence with *instead* implicates that the other element of the same kind does not exist, whereas the sentence with *too* implicates that it exists next to the current element. We can obtain these effects by making the (non)-existence of the antecedent part of the presupposition of the particles. The implications —if they are not already given by the context— are then a result of a partial resolution. The implications are clearly not a part of the content, because of the example (19), mimicking Heim's example.

(19) A: My parents think that I won the gold medal for my essay.
B: My parents think that I won it instead/too.

The differences between the acceptability and obligatoriness of *too* versus *indeed* can perhaps be explained by the failure of certain environments to give a good answer for the choice between *too* and *instead*. E.g. a dream that John had an icecream, when we want to report that Bill had an icecream, does not clearly make a distinction between next to and instead of. Notice that the absence of a particle is not a good alternative either.

(20) Mary dreamt that John had an icecream. Bill had one
?∅/*?too/*?instead.

1.5 Optimality Theory

Blutner (2000) was the first to notice that the defaults and preferences that are so characteristic of presupposition theories can be adequately captured by the soft constraints and the constraint ordering of optimality theory. He proposes two constraints: **Do Not Accommodate** and **Strength**, ordered as indicated. The accommodation constraint prevents accommodation when it is not necessary, the strength constraint prefers the reading of the sentence that gives most information. An absolute constraint of **Consistency** can be added to obtain local accommodations, when global ones are not consistent, though this could also be expressed as a demand on the candidate set of updates as in Blutner & Jäger (1999). The system provides a reconstruction and an improvement of the theory of Van der Sandt (1992). The advantages of the OT version are that it makes accommodation in downward entailing contexts less preferred and that partial resolution is smoothly incorporated.

If optimality theory can be applied to presupposition interpretation, it is natural to ask whether it can be applied to the generation of presupposition triggers as well. In fact, one might first want to be sure that the so-called interpretation principles are not really generation principles in disguise. But it seems impossible to think of a principle like **Do**

Not Accommodate as a generation constraint. Looking at different contexts, we get different interpretations of (21). Yet we do not find a difference in form if we consider the generation in each of the interpretational possibilities. I.e. all four readings (two resolutions and two accommodations) of (21) just give us (21).

(21) Bill believes that John regrets that Mary left.

The best we can do is to say that an intended local accommodation is bad when the context does not yet explicitly rule out global accommodation. A constraint against the use of a trigger in a local context where its presupposition holds according to the speaker, but where global accommodation is possible but not intended by the speaker would be a possibility. But this would capture only a small part of the effects of **Do Not Accommodate**.

The decision to relegate the communication of some content to presupposition accommodation rather than to a separate prior assertion involves considerations of efficiency and even politeness. Though the reconstruction of these considerations plays a role in the interpretation of accommodating examples, their recognition does not seem to be the crucial factor: that is the absence of an antecedent. **Strength**, likewise, is so much a question of choosing between possible interpretations that a corresponding generation principle is hard to imagine. If a weaker reading is intended it can only be obtained by *but*s and *however*s. The need for these *but*s and *however*s seems a consequence of **Strength** as an interpretation principle.

There is a class of presupposition triggers which are obligatory in the sense that if the local context has the appropriate antecedent, the trigger must occur. Intonational marking, discourse particles, pronouns, *another*, *a different*, and some uses of definite descriptions all seem to fall into this class.

The basic observation is that (22) normally cannot be replaced by the sentence without *too* in a context where *too* appears.

(22) John is in Spain too.

This is familiar from the generation of referential expressions. There seems to be a hierarchy of referential devices which can be selected only if the application criteria of the classes appearing above in the hierarchy do not apply. This is not the place for a detailed discussion of all of the application criteria, but there are at least two relevant principles that can be taken from the provisional hierarchy, as given by the table below.

NP type	**selection condition**
reflexive	c-command

1st or 2nd person pronouns	conversation participant
demonstratives	presence in current attention space
anaphoric	high salience through mention
short definites	old, dependence on high salient
other marking NPs	other element of same type
long definites	new and unique
indefinites	new

Grice (1975) observed that in (23)

(23) I saw John in town with a woman.

the woman cannot be known to be John's wife or his mother, even though, strictly speaking, either of them would suffice for the truth of the example. We can also add, on the basis of the hierarchy, that she is also not the speaker or the hearer, or John herself (if the name John could be used for women as well). It can also be assumed that she was not mentioned in the discourse before and specifically not in the last sentence. Grice's two short definites should win from the indefinite, because in that case there is dependence on the highly salient John.

The first principle we can extract from the referential hierarchy is that when some object or event is already in the common ground of the conversation this has to be marked by the choice of the device by which we refer to it. This is the case when we look for a referential device for an object that we need to refer to. This can be an old object or it can be an object that belongs to an old object (it is the restaurant's waiter, one of the playing children, three of the students in the bar etc.). All devices in the hierarchy fulfill the principle except for long definites and indefinites. I want to call the constraint **ParseOld**. It is a parse constraint because it forces the expression of a feature appearing in the input.

The second principle is that the presence of an old but different object of the same type must always be marked. This is the business of *another*, *a different*, *too*, *also* and presumably other elements as well. The constraint is **ParseOther**. We must assume that these two constraints are ranked equally in order to explain the combination of devices as in *another* or *the other*, *this other* etc. (There is no *other me* or *other you*, but they do not seem to be needed).

Both constraints seem to have a primarily psychological explanation. If we assume that the perceptual system is biased to the identification of what is similar, then nothing seems more functional than a controlled use of this bias: inhibit it when necessary and reinforce it when identifications need to occur. **ParseOld** also increases efficiency, since the old marking NPs and VPs are generally much shorter.

The generation constraints affect the distribution of triggers: they force the use of an item from the relevant class of triggers when the conditions for its application occur.

One additional remark about **ParseOther**. Compare (24)

(24) Bill ate from the cake
John did too

and (25)

(25) Bill ate from the cake
No, John did

.

It might seem that the second example is a clear violation of **ParseOther**, in fact, *too* is not even allowed there. But this fits what the second speaker wants to achieve: his proposal is to remove Bill as a cake-eater and replacing him by John. This can in some contexts be marked by *instead*, as in (26). (Not necessarily always: the correction is itself a marker of the *instead* type.)

(26) Bill says that John ate the cake but Harry says that Charles ate it instead.

1.6 Blutner's Theorem

Blutner (2000) provides the following explanation of the fact that intonationally marked topic-focus articulation gives rise to a non-accommodatable presupposition. Given an interpretational constraint **Do Not Accommodate**, the use of topic-focus intonation where the presupposition is not resolvable loses out to the other candidate generations that do not presuppose: they do not violate the accommodation constraint. And it is necessary[5] to include those intonational variants in the candidate set that do not give rise to the presupposition.

The explanation uses a novel way of thinking about the application of optimality theory to the syntax and interpretation of natural languages. We have both interpretation constraints and generation constraints that simultaneously apply to pairs of generations and interpretations. A pair $< g, i >$ can be suboptimal even if the interpretation is an optimal interpretation of the input, because there is a g_1 that can be interpreted with less violations of the interpretation constraints. (Similarly, a generation g can be optimal for the interpretation i by the generation principles but fail because there is a better interpretation i_1 than the intended i available for g.)

[5]Necessary because it is impossible to think of any answer to the hard question which alternatives to include that would omit the intonational variants.

I use *Blutner's Theorem* for the general principle: if a trigger context has simple non-triggering expression alternatives with the same meaning, it does not accommodate. The simplicity of the alternative expressions guarantees that they are considered in the optimality contest so that Blutner's reasoning applies to them. If the context lacks a suitable antecedent and non-presupposing means of expression are available, the principle forces us to choose those means of expression rather than the presupposing ones, which would force an accommodation.

The only alternative explanation of non-accommodation of certain triggers that I know of is Van der Sandt's. He argued that pronouns do not accommodate because they lack sufficient semantic content. Now it is not clear that this does the job for pronouns. In English, the morphology of "her" gives exactly the same semantic content as "a female person", which can be added to the context without any problems, like the even less contentful "somebody" or "something". But the explanation is untenable for particles like "indeed" in a sentence "indeed p". The presupposition in that case is "p" itself. If Van der Sandt's explanation were extended to "indeed", it would follow that the presupposition of factive verbs cannot be accommodated anymore, since "John regrets that p" has exactly the same presupposition as "indeed p".

Blutner's theorem is a strong principle and trying to refute it is a rewarding game. The game is so rewarding that one is sometimes tempted to go to the weaker[6] alternative constraint: **Obligatory Triggers Do Not Accommodate**. So far neither me nor Blutner nor anybody else has come up with a good optimality theoretic reason why this constraint should hold and it is also quite unclear why Blutner's reasoning should be correct in the case of intonation and fail for presupposition triggers. So I want to stick here to the full strength of Blutner's Theorem and use it to draw some non-trivial conclusions about the semantics of the apparent counterexamples.

Occurrences of presupposing particles are unproblematic. One clearly must take the view that the same sentence without them is an alternative to them of the required simplicity. This is largely borne out by the facts, though interestingly not entirely. For example, in (27) in the absence of suitable antecedents, we get, instead of a free accommodation, the inference that it is the speaker who wants coffee. This may be partial resolution based on the naturally highly salient speaker or an idiomatic fact about *too*.

(27) Context: out of the blue

[6]The alternative constraint only applies to particles and other obligatory presupposition triggers and thus avoids the counterexamples.

Do you want coffee too? (speaker)
(??)Do you want coffee instead?

More problematic is the case of *knowledge* and *belief*. It seems that *belief* provides *knowledge* with a simple non-presupposing expression alternative, but *knowledge* still accommodates as well as any trigger. I have to follow here the opinion of most theorists of knowledge that it is simply false that knowledge equals truth plus belief. It is also necessary that the known fact played an appropriate causal role in the genesis of the belief.

A similar case is the putative counterexample (Geurts p.c.) (28).

(28) John managed to break the lock.

Of course *managing* accommodates well and (28) has the simple expression alternative *John broke the lock* but it now just follows from Blutner's theorem that they do not mean the same. This counterexample bites, because it forces us on the slippery slope of having to claim that *manage to X* expresses the subject's ability to do X, which X by itself does not express, even though it entails it. Reasoning of this kind is familiar from the literature on metaphors. (29a.) implies (29b.) and inversely but they do not express the same since the image in (29a.) is missing in (29b.) It is rahter clear that truth-conditional equivalence is not a guarantee of identity of meaning and it is psychological identity that is required for the workings of Blutner's theorem.

(29) a. Henk blew his top.
b. Henk got rather angry

The most interesting counterexample is provided by the opposition between $a(n)$ and *the*. There are uses of *the* that easily accommodate, like: *the inventor of electrical power* and there are cases that follow Blutner's theorem in being nearly unaccommodatable, like *the man* in (30).

(30) The man told me that he was going to get angry.

The choice for a definite description is more complex than just the choice between a presupposing and a non-presupposing article. In fact, it is by no means clear that all uses of definite descriptions are presupposing, compare e.g. the interpretation of (31) under which it is false, in a context where Bill is married to Jane. (Bill clearly could have preferred to stay a bachelor or to marry another person.)

(31) It is necessary that Bill's wife is Jane.

Resolving to the global context to pick up Jane would lead to a true interpretation, quite contrary to intuition. (I am assuming that *necessary* is used in the sense where it rules out that things could have

gone differently. Under that operator, the name Jane rigidly refers to Jane.)

Short definite descriptions can meet the requirement of **ParseOld** both when they obtain a bridging interpretation and when they are anaphoric. In other uses —mostly using long definites so that accommodation is allowed— they reflect the speaker's opinion that she has managed to provide sufficient descriptive material to make the reference unique. In these cases the indefinite article is ruled out or extremely marked. It seems then that the opposition between definite and indefinite article is a double one: uniqueness versus non-uniqueness when a new entity is involved, as well as old versus new.

We may perhaps say that all definite descriptions presuppose. But they only accommodate when they are unique descriptions. The combination of a definite article with a non-unique description is a trigger that has the indefinite article as a simple expression alternative. The combination of the definite article with a unique description does not have the indefinite article as a simple expression alternative. Therefore, only the anaphoric and the bridging uses of definites fall under Blutner's theorem.

Viewed from the perspective of the referential hierarchy, this connects the definite article to three parse constraints: **ParseOld**, **ParseDependent** and **ParseUnique**, with **ParseUnique** ranked lower than the other two and **ParseOld** ranked above **ParseDependent**. In (32), *the man* is selected because pronouns and demonstratives do not apply and the next possibility in the referential hierarchy is the default old-marker *the*.

(32) A girl pushing an old man in a wheelchair came down the path. The man/*he was smoking a cigar.

He is not possible here because the antecedent is not an argument of the main clause and thereby not highly salient. In (33) *the waiter* is selected because it is functionally related to a highly salient item. Choosing *Tim*, or *a waiter* would violate **ParseDependent**. The waiter is a new referent in the story.

(33) We entered the restaurant. The waiter brought us the menu.

Finally, in (34) we find a case where the third constraint applies.

(34) The director of Tim's school is organising a meeting.

A full discussion of these cases within a serious optimality theoretic reconstruction of the referential hierarchy must be deferred to another paper, but it is possible to illustrate what is going on with some OT diagrams.

I am assuming that there are a set of tied constraints at work in NP-selection. The relevant ones for the choice between definites and indefinites are the following: **ParseSalient**, **ParseAttention**, **ParseOld** and **ParseUnique**. I am further assuming that pronouns are parsing salience and oldness, demonstratives attention and oldness, and the definite article uniqueness and oldness. The problem can be given as generating an NP for a discourse referent x that is a book by the author Anna. We assume a further constraint **FaithInt** that marks candidates if their interpretation would lead to the assumption of a feature in the input that is not there. We also need an economy constraint preferring shorter expressions and **Do Not Accommodate** for punishing unresolvable old-marking expressions if we want a fuller treatment.

In the first context x has just been mentioned and it is now salient.

input: x	**Salient=**	**Attention=**	**Old=**	**Unique >**	**FaithInt**
it					
this					*
this book	*			*	
this book by Anna	*				*
the book	*				
the book by Anna	*				
a book by Anna	*				

The winner is *it* in this context, but *this* would win if x were in the centre of visual attention as well, because of the extra mark that *it* would then receive and the mark that *this* would lose.

The second context we consider is that the book has been mentioned before, but is not currently salient.

input: x	**Salient=**	**Attention=**	**Old=**	**Unique >**	**FaithInt**
it					*
this					**
this book					*
this book by Anna					*
the book					
the book by Anna					
a book by Anna			*		

The winner is now *the book* (by economy) but would be replaced by *this book* if it were the case that the book is also in the centre of the visual field.

In the third context, the book is neither old nor in the visual field. It is moreover true in the context that Anna has written a single book only.

input: x	**Salient=**	**Attention=**	**Old=**	**Unique >**	**FaithInt**
it					*
this					**
this book					*
this book by Anna					*
the book					
the book by Anna					
a book by Anna				*	

Do Not Accommodate now decides for *the book by Anna*, because *the book* is not resolvable either in the context of the conversation (it is

not old) or in the general context (there are many books).

And the fourth context is one where Anna is a prolific author. Again the book is new.

input: x	**Salient= Attention= Old= Unique >**	**FaithInt**
it		*
this		**
this book		*
this book by Anna		*
the book		*
the book by Anna		*
a book by Anna		

The definite descriptions fail because they give the feature Old or Unique, which are not features of the input. Alternatively, they can be ruled out by **Do Not Accommodate**. So the winner is *a book by Anna.*

I am giving these diagrams with a great deal of hesitation, because I think the precise treatment of NP selection needs much more work and I am aware of quite a number of problems with the present treatment. These diagrams are only meant to illustrate the approach I am tentatively adopting in this paper to underpin my treatment of presupposition triggers. What they do bring out, I hope, is that the idea of a double function of definite descriptions does not forcibly lead to the view that the definite article is ambiguous. The article marks two different features which guide us to a correct resolution or accommodation. Apart from that function, the definite article has no proper semantic content.

1.7 Inderdaad toch wel immers

The theory I have been sketching in the sections above offers a good basis for the study of discourse particles. The title of this section is formed by four Dutch particles[7].

They typically accompany assertions that came up earlier in the conversation. In this situation —schematically— we can distinguish four different cases: $+S+H$, $+S-H$, $-S+H$ and $-S-H$, depending on the attitude of the speaker and the hearer towards the statement[8]. The speaker and hearer can agree that the statement is true, the speaker can support it while the hearer is against it, the speaker can oppose the

[7] *inderdaad* is equivalent to *indeed*, the others lack a clear English counterpart. *Wel* can be rendered by emphatic *do*, *toch* is sometimes *after all* and *immers* can mostly be rendered by *as you know*.

[8] Neutrality is atypical. One would expect parties to react to each others' statements.

hearer's opinion that the statement is true and, finally, they can agree that it is false. All four cases are exceptions to *Stalnaker 1978*'s theory of assertion which requires of assertions that they be both informative and consistent with the common ground at the point of the assertion. $+S, +H$ and $-S, -H$ are straightforward violations, but the other two go against the spirit of the approach as well. $-S, +H$ and $+S, -H$ make the proposal that the assertion be common ground inconsistent with the common ground as it was developed so far. So in all four cases, the statement is not a proper assertion.

The following is a natural correlation. $+S + H$ *immers*, $+S - H$ *wel*, $-S + H$ *inderdaad*, $-S - H$ *toch*. My first hypothesis was that the particles in fact mark the abnormal assertions for their particular kind of abnormality. But this is easily shown to be false: the four particles can be used all at the same time as in (35).

(35) Jan is toch inderdaad immers wel gekomen.
As you know, John DID indeed come after all.

If we look at more examples, we see that the distribution is not determined by the four conversational situations: the particles have a far wider distribution.

Much better is the following analysis: *wel* p triggers $\neg p$ and the high salience of $\neg p$ ($salient(\neg p)$). *Toch* p (in one important reading) triggers $\neg\ p$, without the high salience. *Inderdaad* p triggers p and so does *immers* p.

Immers is special because it also indicates that the most salient statement is true because of p. An *immers* statement is normally an argument for the statement that comes immediately before it. This gives *immers* a requirement that puts it in the same context as the motivated statement: normally the global context, i.e. the common ground. A proposition that is not common ground cannot justify why another proposition should be in the common ground. This makes *immers* unique among the four particles in not taking inaccessible antecedents and in having an unproblematic relation with the Stalnaker conditions: an *immers* sentence can only be used when the common ground does not yet contain the causal or evidential connection it expresses. The fact that *immers* is obligatory for expressing a causal or evidential connection from a common-ground item to a common ground item, even when other causal markers are around, leads to the following curious fact: a presupposition trigger occurrence that cannot resolve.

(36) Omdat Piet naar huis ging, kon hij niet meehelpen.
Because Piet went home, he could not help.

Omdat is a presupposition trigger like its English counterpart *because*. Yet, when it is resolvable to the common ground, the sentence would require an occurrence of *immers*. So it follows that the presupposition of *omdat* cannot resolve without the presence of *immers* and must therefore accommodate[9].

Immers lacks inaccessible antecedents for the same reason as *again*: its semantic content relates the current clause to an earlier one.

Wel, *toch* and *inderdaad* presuppose the negation, the falsity and the truth of the clause they mark. *Wel* does that over a short distance only: there must be a relation of parallelism between the negation and the occurrence of *wel*. But unlike *immers*, they also take inaccessible antecedents. The speaker's beliefs, the hearer's beliefs, and suggestions by any other party all provide good antecedents, as is shown in (37).

(37) Jan droomde dat hij het tentamen niet gehaald had, maar hij is wel geslaagd.
John dreamt that he did not pass the exam, but he made it allright.
Jan dacht dat hij het tentamen niet zou halen, maar hij is toch geslaagd.
John thought that he would not pass the exam, but he made it allright.
Jan droomde dat hij het tentamen niet zou halen, en hij is inderdaad gezakt.
John dreamt that he would not pass the exam, and indeed he failed.

This means that our initial hypothesis is just a special case. Apart from *immers*, there is no marker that specialises in a combination of a speaker and a hearer attitude. The other particles can be used in the indicated combination of attitudes, but that is not a requirement for their use at all.

Combining things, we can indeed come up with a context that combines the use of the four items at the same time, as in (38).

[9]In an earlier paper, *Zeevat 1997*, I claimed that the indefinite article was a trigger which obligatorily accommodates, and supported this by the analogy to Latin and Russian that do not have the grammatical obligation of putting an article. The behaviour of indefinites can in the current context be characterised by letting them be presupposing without marking the referent as old. This, by the principle **ParseOld**, entails that they cannot be resolved: if they were, they would be replaced by an old-marker such as the definite article. Bare Latin or Russian NPs behave like normal presupposition triggers because these languages lack the definite article as an old-marker. Other cases of non-resolving triggers can be obtained by giving the lexical material of the presupposition of a trigger the intonation that indicates they are new material.

(38) We weten dat Jan thuis is. Ik begrijp niet waarom Piet beweert dat Jan er niet is want hij is immers inderdaad toch wel thuis.
We know that Jan is home. I do not understand why Piet claims that Jan is not there, because as you know, he IS indeed at home allright.

There are many issues that must remain undiscussed in this section. Which class of particles can be treated as presupposition triggers taking inaccessible antecedents? Does the treatment cover all uses of *toch*, *inderdaad*, *wel* and *immers*? These questions are difficult and have to be deferred to another paper[10].

1.8 Classifying Triggers

I claim that triggers are fully determined when three properties are known: what they presuppose, what they require from their presupposition and whether they have a simple expression alternative.

The answer to the first two questions determines to what extent the trigger can take inaccessible antecedents. The answer to the third question determines whether or not they can accommodate. In addition, there are generation constraints responsible for obligatory occurrence and the absence of obligatory old-markers (or new marking) may force non-resolving readings of certain triggers.

trigger	**presupp.**	**requir.**	**inacc.**	**oblig.**	**resol.**	**accom.**
the$_1$ N	$x, N(x)$	x	some	yes	yes	no
the$_2$ N	$x, N(x)$	$\exists! x N x$	no	no	yes	yes
a(n) N	$x, N(x)$	x	no	no	no	yes
regret p	p	Bp	some	no	yes	yes
bachelor(x)	man(x)	man(x)	no	no	yes	yes
manage to X	difficult(X)	none	no	no	yes	yes
because p	p	p	no	no	yes	yes
omdat p	p	p	no	no	no	yes
omdat immers p	p	p	no	yes	yes	no
know p	p	p,Bp	no	no	yes	yes
destressed X	X	none	yes	yes	yes	no
too(S(x))	$S(y)$	none	yes	yes	yes	no
instead(S(x))	$S(y)$	none	yes	yes	yes	no
wieder(X(e))	$X(e')$	$e' < e$	no	yes	yes	no
inderdaad p	p	none	yes	yes	yes	no
wel p	$\neg p$	none	yes	yes	yes	no
toch p	$\neg p$	none	yes	yes	yes	no

[10] A more extended treatment of these particles can be found in Zeevat (to appear)

immers p	$p, salient(q)$	$reason(p, q)$	no	yes	yes	no

This table lists the trigger, its presupposition, its requirement, taking of inaccessible antecedents, obligatory occurrence of the trigger, whether it resolves or not and finally whether it accommodates or not. In the table *destressed* stands for intonationally marked topic, the columns *resolving* and *accommodating* indicate whether the trigger's presupposition can be handled by resolution or accommodation respectively. The theories of Heim and Van der Sandt posit the identity of the presupposition and the requirement and put the last two columns uniformly to yes. They have nothing to say about the variation in the fourth and fifth column.

1.9 Conclusion

I have presented the outlines of a presupposition theory that is more linguistically inspired than the standard theories and that is a good tool for understanding of those triggers that are only marginally considered

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