Presupposition or Abstract Object Anaphora?: Constraints on Choice of Factive Complements in Spoken Discourse

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ABSTRACT. Using results from an empirical study of factives in spoken English, a comparison is made between factive verbs and their presupposed complements, both bound and accommodated, and their non-presupposing alternatives: abstract object anaphora that derive an antecedent from a discourse-given linguistic expression. The role of discourse structural constraints and grounding in choice of expression and the contexts in which they are used is discussed. Finally, the results are related to theoretical issues in presupposition theory having to do with the difference between anaphora and presuppositions, the ability of presuppositions to accommodate and the nature of accommodation.

Introduction

The aim of this work is to give a better description of the distribution and function in spoken dialogue of one expression type in one specific construction, complements of factive verbs that can be used to refer to an abstract object.

Factive verbs presuppose their sentential complements. For introducing the same information the non-presupposing alternative is to assert the information, making it part of the discourse record, and then refer to this information with an abstract object anaphoric expression such as a pronoun or definite noun phrase. An example may make things clearer. Here factive verbs are marked with **bold** and abstract object anaphora are written in CAPITALS.

Example (1)
a. Computational linguists are in demand.
b. Students apply for our program because they **know** that (computational linguists are in demand).
c. Students apply for our program because they **know** THIS.
d. Students apply for our program because they have **noticed** THIS TREND/THIS FACT.

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Sequence ab illustrates a bound presupposition usage with the presupposition in parentheses, ac illustrates abstract object anaphoric reference, as does ad, though here a full NP is used. It is possible to communicate the same information by using b alone, in which case the presupposition would be considered to be accommodated. In order to learn more about the use of these different expressions in natural spoken discourse, a corpus study was done.

1 Background

This first section explains the anaphoric theory of presupposition, and how it functions with the factive verbs studied here. The second section presents abstract objects, and how they can be referred to as well as proposed constraints on their usage based on discourse structure.

1.1 Presuppositions as Anaphora

The anaphoric theory of presupposition, developed by van der Sandt (1992), argues that presuppositions can be treated just as anaphora are treated in DRT (Kamp & Reyle 1993). Presupposition resolution involves examining the previous discourse context for an antecedent. If an antecedent is found then the presuppositions is bound to it. If an antecedent cannot be found then the presupposition is accommodated, and the ability to accommodate is what distinguishes presuppositions from other anaphoric expressions.

Factive verbs presuppose full propositions, and it is not immediately evident how binding should be identified here. The potential antecedent must be sufficiently similar to the presupposed proposition so that the latter can truly be considered to function as an antecedent. Examples where the potential antecedent is identical with the presupposed proposition, as in Example (1) ab, are probably rare. Speakers tend to vary their speech and avoid uninformative repetitions, and this means that there are potentially great difficulties in identifying propositional presuppositional binding.

The ability of presuppositions to accommodate is suggested in van der Sandt (1992) to be related to their greater semantic content and internal structure. Other anaphoric expressions are said not to be able to accommodate.

Despite the popularity of the anaphoric theory of presupposition, there has not been much work that studies presuppositional usage from the same perspectives that are considered central to characterizing the use of anaphoric expressions, such as the choice between a presupposition or a non-presupposing form, e.g., parallel to the choice between a pronoun or a name, or constraints on accessibility[1] of potential antecedents. Generally, in theories of anaphora accessibility, the number of potential antecedents in the previous context decreases as the semantic content of

[1]Here I mean accessibility in terms of salience, attentional state, etc., and not the structural accessibility of discourse referents within embedded DRSs as the term is used in DRT.

the anaphoric expression increases. This in turn allows a greater distance between anaphor and antecedent with semantically highly specified anaphora because the antecedent should be easy to identify even with a certain amount of distance. Because the presuppositions of factives are semantically very rich, we can begin with the hypothesis that they will allow longer distances between antecedent and presupposed propositions than abstract object anaphora and the linguistic expressions from which their antecedents are derived.

A puzzling question though, is why speakers would ever choose to use a factive verb with a presupposed sentential complement if it will get bound, i.e. why repeat an already given proposition? This would seem to break the informativity constraint on discourse. Repeatedly using definite NPs, for example, to refer to already introduced entities seems more natural because we often need to refer to the same discourse individuals or objects, in order to describe them in new situations and relationships. But propositions would seem to be unnecessary to repeat.

However, Walker (1996) has shown that informationally redundant utterances, or IRUs, are not at all infrequent in spoken discourse, citing that they made up about 12 % of the utterances in her corpus study of collaborative task dialogues. She gives three categories of communicative functions based on the corpus study, these were 1. *Attitude* : which seems to be the use of an IRU for explicitly grounding, 2. *Attention* : use of an IRU to make a propositions salient, or 3. *Consequence* : an IRU is used "to augment the evidence supporting beliefs that certain inferences are licensed" (Walker, 1996, p. 5).

Can bound propositional presuppositions be considered to be informationally redundant utterances? I think their status is somewhat different. Examine the formal definition (taken from Walker (1996), p. 5): An utterance u_i is INFORMATIONALLY REDUNDANT in a discourse situation **S**

> (i) if u_i expresses a proposition p_i, and another utterance u_j that entails p_i has already been said in S.
> (ii) if u_i expresses a proposition p_i and another utterance u_j that presupposes or implicate p_i has already been said in S.

Presuppositions differ from IRUs in two important ways. The first is that they have been presupposed. The speaker is therefore explicitly signalling that the information is known, given and should be accepted as backgrounded by the hearer. The second difference is that presupposed propositions occur in utterances that also have an assertional component, in which case the utterance itself is not informationally redundant, but the presupposed part is.

Still, even if the use of given or bound presuppositions is distinct from the use of IRUs, the functions of propositional presuppositions that are bound may be similar. Hopefully empirical study can answer some of these questions.

1.2 Abstract Object Anaphora and Discourse Structure

The type of higher order entity anaphora being referred to here as abstract object anaphora has been called many different things in the literature, e.g. discourse deixis (Webber 1991, Eckert & Strube, 2001), situation anaphora (Fraurud, 1992), and finally, as abstract object anaphora, by Asher (1993).

All these terms are used to refer to anaphoric reference to situations, factualities, eventualities, propositions, speech acts, as well as more deictic functions referring to the reference of a discourse segment, though many of these distinctive uses are often difficult to distinguish in practice. We can often find examples of different aspects of the same antecedent being referred to by the same type of anaphoric expression, and where the actual type of the referent is coded in the predication of the sentence in which the anaphoric expression is used. This observation is made by Asher(1993), Dahl & Hellman (1995) and is an important part of Eckert & Strube (2001). The type of entity also may be indicated by the NP used, as in Example (1) `d.` The continuation of Example (1) below illustrates some other possibilities. The sequence `ae` indicates that we should consider the type of referent a proposition, because usually only propositions can be considered true or false. Continuing with the sequence `af` means that the type will be a situation, as coded in the noun phrase. Eckert & Strube (2001) use this information to distinguish between individual and abstract object anaphoric reference which then helps guide their resolution algorithm.

Example (1) `continued`

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e.  Everyone at the university knows that THIS is true.
f.  THIS SITUATION has led to an alarmingly high drop-out rate
as students leave school to take industry jobs.
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Dahl & Hellman (1995) discuss abstract object reference as a type of anaphor that instigates a process of reference-creation, or reference coercion; that is, using an abstract object anaphor signals to the interpreter to look for established information of the appropriate type in the discourse record and create a discourse referent that can function as an antecedent from this linguistic information. Dahl & Hellman (1995) further list three referent creating operations, 1) Summation and Complex Creation, 2) 'Type-coercion' and 3) Abstraction and Substitution. The process of referent-creation has been compared to that of accommodation by Eckert & Strube (2001), though it is unclear if this should be considered accommodation in the same sense as it is used within the anaphoric theory of presupposition. For presuppositional accommodation, new information is added to the discourse record, but in referent-coercion, already given information is considered in a new way.[2]

[2]Some researchers have argued that there is only accommodation when the information is new, and information that is derivable from an already given representation is technically not new. Here I think it is unclear what the status of information that is available in the discourse record in different forms actually is. Developing a distinction similar to that in computer science between Information

Abstract objects have been shown to be severely constrained in their ability to be accessed by anaphoric means, and these limitations seem to be due to discourse structural constraints. For example, Webber (1991) has argued that abstract object anaphora can only access discourse segments on the right frontier of the discourse structure for referents; discourse segments on the right frontier are also those in focus, or salient.

Fraurud (1992) has argued that Webber's description of constraints on accessible antecedents is for the most part correct, but that in addition to unfocussed discourse segments, propositions that are subordinate to a main proposition also need to be excluded from supplying an antecedent for abstract object anaphora. She gives examples that show that the simple tree structures used by Webber to represent discourse structure don't correctly capture the full range of distinctions that will be relevant because the right frontier constraint doesn't give a means by which to factor out subordinated or modifying propositions that are conjoined with a main proposition as part of the right frontier. Making a distinction between main and subordinating propositions would solve this problem, though a different discourse structure with different accessibility rules would be necessary.

As this earlier work indicates, discourse structure is generally agreed to constrain accessibility for abstract anaphoric reference. In order to be able to discuss possible discourse structural constraints on accessibility, it is necessary to define what units of discourse structure will be considered relevant, i.e. the discourse segmentation. So far, most work on discourse structure (including that mentioned above) has focussed on written discourse, and work on spoken discourse has looked mainly at utterances and how they form adjacency pairs, only sometimes considering a more hierarchical structure. It is not clear what levels of structure are present in spoken dialogue, nor what units will be relevant to the discourse participants and discourse interpretation. Generally, the levels that have been discussed in the literature include a speech act or discourse move level. These are usually then discussed as adjacency pairs or as instances of dialogue games, e.g. as in Carletta et al.(1997), or called discourse units. Finally, a higher level is sometimes postulated that in Carletta et al.'s coding scheme has to do with domain specific goals in the discourse. Which, if any of these levels, is relevant for characterizing anaphoric (and presuppositional) accessibility is still unclear.

Eckert & Strube (2001) is therefore particularly relevant to the work here in that they have done empirical work on the special problems of anaphoric resolution in spoken discourse. Their work is a corpus study of the SWITCHBOARD corpus, a spoken corpus of telephone conversations between two participants who were unaquainted with each other before their conversation.

Eckert & Strube use a very simplified discourse structure but seem to get reliable results in using this simplified structure to delimit potential antecedents for

Extraction and Data Mining, i.e. between retrieving information you knew existed and gleaning new information that you weren't aware of from an existing knowledge representation, might be helpfully related to accommodation, and discourse interpretation in general.

personal pronouns as well as for abstract anaphoric pronominal reference. They analyzed each utterance as being a dialogue act of one of three types based on the top dialogue moves in Carletta et al.(1998): Initiation, **I,** Acknowledgment, **A** and **A/I** for those utterances which served both an initiating and an acknowledging function. These dialogue acts are then paired into what are called synchronizing units (**SU'**s). Certain dialogue acts don't require acknowledgement, and these may be represented by as single **I** and still be interpreted as an **SU**. Central to their work is the idea that grounding constrains the accessibility of antecedents. Grounding is the process by which discourse participants signal that information introduced in the discourse is part of the common ground (Traum 1994), by some sort of acknowledgment. **A** 's (Acknowledgments) are grounding acts. Discourse referents or information introduced in utterances that are not acknowledged, that is, not grounded, are not available for anaphoric reference. Note however that while acknowledgement is a signal of grounding, lack of acknowledgment is not necessarily as sign of lack of grounding, and the lack of a protest, or allowing the speaker to continue to have the floor, can be considered a type of implicit grounding. Eckert & Strube (2001) also give an example where a clear indication that a Speaker's utterance was not grounded by the other participant means that the discourse segment and referents within that segment are not added to the common ground, and therefore are not available for anaphoric reference of any kind. In this way they define what is salient or in focus as that which is in common ground, and the need to clearly identify grounding is also reflected in how they choose to code discourse structure.

2 Empirical Data and Method

Examples of factive verbs in context were excerpted from the London-Lund Corpus of Spoken English (LLC)[3]. 50 multi-speaker dialogues were used, which contained roughly 233,000 words. The following factive verbs were excerpted:

> **Factive verbs: subject complements** *count, make sense, suffice, amuse, bother, matter*
> **Factive verbs: object complements** *discover, find out, know*[4]*, notice, realize, regret, resent, see*

Examples without a complement, or with an NP-object, non-abstract object complement, were discarded. For each example, the relation between the potential antecedent, if there was one,[5] and discourse structure was examined, noting speaker

[3]Information on obtaining this corpus can be be found on the ICAME website at http://www.hd.uib.no/icame.html

[4]"know" with a sentential complement not marked by *that* is not included in the analysis due to the great number of false hits found because the corpus is untagged, meaning that these examples must gone through by hand. The author plans to do this at a later date.

[5]Presupposed propositions without antecedents are accommodated for that very reason.

TYPE	TOTAL	ACCOM PRESUPP	BOUND PRESUPP	ABS-OBJ ANA
object comp	75	48	6	20
subject comp	13	0	0	14
TOTALS	88	48	6	34

Table 16.1: Type of Abstract Object Complement

shifts between antecedent and anaphor, distance, in utterances, and any other relevant aspects. The analysis was done from the perspective of the annotator.

The dialogues studied seemed to be more complicated than those studied by Eckert & Strube in that many were between more than two participants. Because they take place in person so turn-taking is less precise and there are many cases of overlapping speech. Additionally, the participants often know each other well, which also seems to support interruptions and overlaps.

To adapt Eckert & Strube's coding of discourse structure to dialogues between more than two participants, the following guidelines were used: An utterance may be grounded by more than one speaker and this was often the case - so a synchronizing unit (**SU**) can be made up of a sequence of multiple **A**'s as long as they are acknowledging the same **I.** Sometimes one speaker will clearly acknowledge another speaker while after a third speaker has contributed an **I,** which means that **SU**'s must be able to overlap (cross structures) (e.g. we can have Speaker A: I_1 , Speaker B: I_2 , Speaker C: A_1 , Speaker A or C: A_2). Segmentation was done making each new turn a new utterance and splitting a turn into more than once act if part of the turn clearly only has an acknowledgement function. Of course- if an utterance with an abstract anaphoric reference overlaps with another utterance this cannot be a potential antecedent as it is not yet part of the discourse, and for this reason overlaps must be taken into consideration.

3 Results

Table 1 presents the results. By far the most frequent usage was a presupposed proposition that had to be accommodated (48 examples).[6] Looking at an example wouldn't really contribute to the discussion here so because of space limitations no examples will be given here.

The next largest group found were abstract object anaphoric reference. Here particular attention was paid to the discourse structure and whether or not utterances were grounded, using the modified coding system based on the one given in Eckert & Strube (2001) and described above.

[6]Note that accommodation can occur globally (39 examples), or intermediately and locally (9 examples) according to van der Sandt's (1992) theory.

Example (2) Same speaker, previous discourse segment, chain of references

Speaker A: So that it's the faculty of arts,	I	↖	
or the faculty of economics or both that'll			**SU**
be putting him forward (1)			
Speaker B: Mmm. (2)	A	↙	
But they can put it forward for any title			
that they like apparently.(3)	I		
I didn't realize THIS. (4)	I	↖	**SU**
1 to 2 sylls. so this		↙	
Speaker A: No, I didn't know THAT. (5)	A		

Here, utterances were considered to be discourse segments. In the example above it seems clear from the speaker's use of "No", in "No, I didn't know that," that he is referring to B's last utterance, and not to the entire informational content of what B has just said. THIS (4) refers to an abstract object derived from the linguistic expression in discourse segment (3). THAT in (5) refers either to the same thing as THIS in (4), making this a chain of abstract reference.

Example (3)[7] Overlapping speech, source of abstract object could be synthesis of several utterances made by different speakers

Speaker C: University of the Air (1)	I		
Speaker D: *that would be S* (2)	n.g.	↖	
Speaker C: *are doing a series* on various	I		
sorts of +communication which struck me			**SU**
immediately as **disparates** (3)		↙	
Speaker B: +disparates, surely+ ? (4)	A		
Speaker D: **<but but>** but it would be,			
um it would be non-surreptitious	I		
wouldn't it ? (5)		↖	
Speaker C: *presumably* (6)	A		
Speaker B: *yes -*, it would be			**SU**
+non-surreptitious+ (7)	A	↙	
Speaker A: Yes, (8)	A		
but THAT wouldn't matter. (9)	A/I		

In the above example, four different speakers take part, and identifying synchronizing units was not totally straightforward. Eckert & Strube's coding system is expanded to allow different speakers to each ground the same utterance (here (6), (7), and (8), grounding (5)) and still consider it to be one SU. Utterance (2) is labelled as "n.g." for "not grounded" and this discourse segment does not introduce any referents available for anaphoric reference. Note that it overlaps with part of

[7]Note that the diacritic marks that encapsulate parts of the utterances mark where the speech of speaker's overlapped. Here, for example,"that would be S" and "are doing a series" overlapped.

(3). Here I have split Speaker A's utterance into two discourse segments, (8) and (9), because (8) seems to solely have a grounding function, whereas (9) seems to be informative, though it is not clear if this is the correct segmentation. Speaker A's abstract anaphoric reference in (9) seems to refer to the immediately proceeding grounded SU (5-8), or could perhaps be considered to referring to only the grounded portion, (6-8). It is not clear what analysis would be correct, though in both cases the abstract object anaphor derives its antecedent from an immediately preceding discourse segment, within the same SU, and it is impossible that the anaphora could be referring to the previous SU (1-4).

The forms of abstract object anaphora used may also be of interest. There were 8 cases of *it*, 2 cases of *this*, 18 cases of *that* and 3 cases of *zero anaphora* and 2 cases of *definite noun phrases*. For almost all examples a linguistic expression that could be a source for an abstract object could be found in the previous SU, or in the same SU, though there were a few exceptions. In 19 cases the same speaker who uttered the abstract object anaphor also had said the linguistic expression from which its antecedent can be derived; in 12 remaining cases the speakers were different, and in 3 cases it is impossible to pinpoint exactly what utterance(s) provided the antecedent are (cf. Eckert & Strube who also found a great number of vague or difficult to identify abstract anaphoric occurrences), though it is clear that it is part of the previous context (e.g. previous or same SU), it is often (as illustrated in example (3)) a question of determining how much of the previous context is intended as the antecedent. It also seemed that the simple analysis of discourse structure modified from Eckert & Strube was helpful and adequate to organize and understand the data.

The next example illustrates something that could potentially be considered presuppositional binding. In determining presuppositional binding the entire discourse record up until the use of the factive was taken into consideration. The criteria used to determine if binding was a potential analysis was the authors own intuitions as to whether the presupposed information was new, or had already been given in some form in the discourse.

Example (4) Presupposed propositions - bound
Speaker A: It was lethal to expectant mothers
with small children. (1) (38 intervening lines of text).
Speaker A: After all, I mean you can't go down and shop if you
KNOW that you're going to knock out an expectant mother ...
it was some violent streptococcus that he'd got (2)

Here the presupposition is that "you" (or anyone, in a generic sense) would knock out an expectant mother if having been infected with the streptococcus referred to by "it" in utterance (1). Here it is arguable that the information presupposed in (2) is not really new, in that utterance (1) refers to the same situation, though in a different way and with some other conclusions thrown in. Note that there really seems to be no point in doing a discourse segment analysis here, because the

intervening 38 lines means that the presupposed proposition is very far removed from utterance (1). Another one of the examples of potential binding also had a 900 line gap between potential antecedent and presupposition.

4 Discussion

To summarize the results: Factive verbs, for the uses studied here, overwhelmingly tend to occur with full propositional presuppositions that need to be accommodated, i.e. they presuppose discourse new information. Factive verbs also appear with abstract anaphoric complements that then refer to abstract objects. The use of factive verbs with presupposed information that is already part of the discourse record, e.g. presuppositional binding, is minimal (only 6 examples!).

The binding examples are most interesting to discuss first as one interesting research question was why speakers would choose to use full presuppositions when the presupposed information can be considered to be already part of the discourse context. The answer seems to be that they seldom do, but when they do, the function of the presupposition in the discourse seems tentatively to be one of the following:

(1) The bound presupposition has a *summation* function Full sentential complements are used to explicitly express as a whole an idea that was present only in bits and pieces in the earlier discourse, perhaps even contributed by one or more speakers. This usage seems to relate to the referent-creating operation of *Summation* proposed in Dahl & Hellman (1995), and may also be the effect of the multi-speaker discourse setting in that information is being contributed from so many different directions.

(2) The bound presupposition states some kind of conclusion that is deductable or inferrable from the discourse record Fully inferrable information is considered to be known information. If a strict definition of accommodation that limits its application to new material is used, then the presupposed proposition is known and must bound because it must be true in each attentive speakers information state. However, it is being expressed in the discourse explicitly for the first time here. All conclusions may or may not have been realized by *all* discourse participants. Multi-speaker dialogue may need to use presuppositions this way because establishing information as mutually known is a more complex task when several discourse participants are involved than when only two participants are involved. In fact, it would be strange if we would not need to explicitly conclude things on occasion, as a form of grounding.

(3) The bound presupposition has another pragmatic function than the original, asserted usage. There were two examples where this could be considered to have been the case. In one example the presupposed information was a near repetition of the other speakers immediately proceeding statement and had the function of showing agreement. In the other example, the repetition was used to relate what another speaker had said, so should perhaps not be considered as

very good example of a presupposition. [8]

(4) The linguistic expression from which the abstract object could be derived is in a discourse segment that is no-longer accessible for reference. This was my original hypothesis about when speaker would chose to use a bound presupposition, given the great number of constraints on abstract object anaphoric reference. Indeed, for five of the six examples found here, it would be awkward, if not impossible, to refer to the same information with an abstract object anaphor.

Two of the communicative functions of IRUs identified by Walker (1996) (see subsection 1.1) were quite similar to the usages identified above. Category (1) seems very close to the *Consequence* communicative function and *Attitude* seems similar to category (2), a kind of grounding function. *Attention*, would have most likely fallen under category (4), but there were no examples of category (4) found.

In light of the infrequent cases of potential binding, and the dubious ways in which the potential antecedents often were related to the presupposed proposition, is it defensible to consider the cases found as actual binding?

If we take the idea of presuppositions as anaphora seriously, then perhaps we should also seriously entertain the idea that binding presupposed propositional information may also be constrained by the same discourse structural constraints as abstract object anaphora. Until now I have been working under the naive assumption that presupposed propositions, because of their greater semantic content, will freely allow reference from almost any position in the discourse.[9] Usually the discourse structural constraint on accessibility of anaphora can be tested by creating example sentences and considering what interpretation the anaphoric expression will get. Unfortunately we cannot test for constraints on the accessibility for presupposed propositions in this way because we can't really distinguish between our own processes of binding or accommodation.

While we can't really test accessibility in the way we can for abstract anaphoric reference, we can however make conclusions about whether or not the presupposed information has entered into the common ground of the discourse participants, the most important criteria for anaphoric reference accessibility in Eckert & Strube's study. Indeed, the explanations for the use of a bound presupposition given in (1), and (2) above could both be described as cases where the speaker was unsure if the presupposed information had entered into the common ground, and that his/her usage of a presupposition with this information was in a sense a way to ground it. Presupposing as an information presentation device may be quite apt in that the information presented is uncontroversial information that may already be known to some discourse participants.

The analysis of the examples of binding given above can then be revised. Parallel to constraints on abstract object reference, we could consider that these exam-

[8] In this example the speaker first described a situation with a proposition, and then related a story about another person's reaction to the same situation. When reporting on the other person's reaction, she used the same proposition, but as the complement of a factive verb

[9] Excluding of course structurally inaccessible positions due to context created by logical operators, such as modal contexts, modal subordinating contexts, and belief contexts

ples represent information that is not considered by the participants to have truly been established in the common ground, and therefore is unavailable for binding. We could also disallow binding for some examples based solely on the idea the great distances between potential antecedent and presupposition make reference unacceptable. In an interesting twist, taking the analysis of presuppositions as anaphora full out, and applying the same types of constraints to them, actually gives us an analysis where presuppositions and anaphoric alternatives are used in functionally complementary distribution, but not as first thought. Presuppositions present new information or ground unclear information, abstract object anaphora in the same context (here, as the complement of factives) refer to already given information.

If the cases earlier identified as binding are now categorized as accommodation, then all examples found in the data of presupposed propositions were accommodated. What does this tell us about the use of factives in particular, and the nature of presupposition accommodation in general?

Remember, van der Sandt's (1992) theory tells us that presuppositions should theoretically be able to both bind and accommodate, and that the ability to accommodate has something to do with the semantic content of the presupposition. The conclusions reached here suggest that in practice not all triggers are used to do both. And for factives particularly, binding does not seem to be a normal usage. Factive verbs with a presupposed complement are then used primarily to introduce discourse new information.

In terms of how much semantic information is being presupposed, factive verbs, because they presuppose entire propositions, must be one of the richest triggers. Because anaphoric expressions and presuppositions with lesser semantic content are considered not to be able to accommodate, or to accommodate badly, it is tempting to interpret the results here as evidence that the reverse is also true: Presupposition triggers with a rich semantic content can not only accommodate when necessary, but this is their preferred usage.

All this has relevance to our view of the nature of accommodation. There are two competing views of accommodation: that it is a repair strategy, and something that should be avoided and the view that it is a normal method of communication. Most work on presuppositions seems to have taken the former view. Of course, in presupposition resolution binding must be preferred over accommodation, hence the preferences in van der Sandt (1992) and in Blutner (2000)'s constraint AVOID ACCOMMODATION in his bi-directional OT treatment of presupposition. Zeevat (2001), building on Blutner (2000) has argued that it is not the richness of semantic content that determines what expressions can accommodate, but the availability of non-presupposing alternatives. If an alternative is available, AVOID ACCOMMODATION will inhibit, or even block the speaker's use of a trigger to be accommodated because there is a simpler alternative. The speaker should choose to use the simpler alternative, and non-presupposing alternatives are by their very nature simpler. For factives, there *is* an expression alternative: assert and then refer with an abstract object anaphora, but this alternative has been shown to not always be

available, and therefore it may be incorrect to consider it a true blocking alternative.

This view of accommodation is still one that considers it to be a repair strategy by the hearer when a non-presupposing alternative was available to the speaker. Accommodation is considered to be a costly method of communication that could lead to misinterpretation, and something that both speakers and hearers should avoid.

Again, I think the results here suggest a different view. Accommodation is both an exploitable[10] communication strategy and a repair strategy, but it depends on the trigger involved and the context. Sometimes asking your listener to accommodate is the best means by which to express your idea and when the semantic content of the trigger is rich enough that accommodation can proceed without the danger of misinterpretation on the part of the hearer, then it *is* the most optimal way to communicate, and that is why factives with presupposed, accommodated complements are the norm.

So the presupposition triggers that are best equipped for accommodation, e.g. those with rich semantic content and structure, will also be exploited by speakers to the fullest as this will be the most effective and economical way to introduce information. In fact, more effective than non-presupposing alternatives in certain cases. Those triggers that are worst equipped for accommodation, e.g. those whose meaning is underspecified to the degree that accommodation is a strain on the listener, and a real potential source of confusion, e.g. most pronominal anaphora, will not be exploited by speakers, though these will be able to be interpreted by listeners by accommodation when necessary - and then it is *being used* as a repair strategy. Accommodation should be considered to be an available option for hearers both for anaphora and presuppositions, but speakers will tend to limit their exploitation of the hearer's ability to accommodate to semantically rich anaphoric and presuppositional expressions.

5 Future research

Differences between other presuppositions and their non-presupposing alternatives should be looked at more carefully. The results here should also be compared with written discourse, in particular because written discourse seems to have a more hierarchical discourse structure than dialogue, and it would be interesting to see how this would affect the choice to use presupposed complements.

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[10] Actually Lewis's (1979) original paper on accommodation seems to characterize it as a type of 'exploitation' of the hearer's ability to make certain inferences by the speaker, hence the master-slave analogy he uses.

helpful comments. All errors are my own.

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