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MINIMIZE RESTRICTORS! (NOTES ON DEFINITE DESCRIPTIONS, CONDITION C AND EPITHETS)*

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Abstract

Following a general line explored by Bolinger, Reinhart, Levinson and Schein, we seek to derive Condition C of the Binding Theory from a Gricean maxim of minimization (*Minimize Restrictors!),* which specifies that a definite description *the A B* is deviant if A could be dropped without affecting (i) the denotation of the description, and (ii) its various pragmatic effects. Thus *the small (American) President* is deviant if it is assumed that there is a single (American) President, as *small* contributes neither to (i) nor to (ii). By contrast, *the stupid (American) President* is entirely natural: although *stupid* does not affect (i), it contributes pragmatic information about the speaker's (negative) attitude towards the denotation of the description. If pronouns are treated as short descriptions and if the semantics is set up in a slightly non-standard fashion, Part (i) of *Minimize Restrictors!* can derive the standard cases of Condition C. Furthermore, Part (ii) accounts for some *exceptions* to Condition C. First, an element may contribute expressive information about the speaker's attitude towards the denotation of the description, as is the case of epithets (e.g. *the idiot* expresses the speaker's negative attitude towards the person in question). Second, an element may serve a disambiguating function, as happens in very long sentences in which a definite description is acceptable in violation of Condition C (e.g. *the linguist* in: *[A linguist working on Binding Theory]$_i$ was so devoid of any moral sense that he$_i$ forced [a physicist working on particles]$_k$ to hire [the linguist's]$_i$ girlfriend in his$_k$ lab.*)

1 Introduction

Condition C of Chomsky's Binding Theory specifies that a definite description or a proper name cannot appear in the scope of (=cannot be c-commanded by) a coreferring

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As the subtitle indicates, this is by no means a fully worked-out proposal. Due to time pressure I had to write up these notes before I was able to make the revisions that would have been necessary for a more systematic presentation.

expressions, as is illustrated in (1)-(2) (Chomsky calls proper names and definite descriptions 'R-expression', a terminology we will sometimes follow).

(1) a. ??John loves people who admire John
a'. *He_i loves people who admire $John_i$
b. John's mother loves people who admire John.
b'. His_i mother loves people who admire $John_i$

(2) a. *?The director loves people who admire the director
a'. *He_i loves people who admire the $director_i$
b. The director's mother loves people who admire the director.
b'. His_i mother loves people who admire the $director_i$

Violations are particularly severe when the R-expression is c-commanded by a coreferential *pronoun,* as is shown in the a'-examples. When there the R-expression is not c-commanded by the other expression, no ungrammaticality ensues, as shown in the b-b' examples.

Interestingly, descriptions that have an expressive component escape at least some cases of Condition C. Standard cases involve epithets, which specify the speaker's negative attitude towards the denotation of the description ((3)a). But descriptions with a positive expressive component appear to behave in the same way ((3)b):

(3) a. $John_i$/(?) he_i is so careless that $[\text{the idiot}]_i$ will get killed in an accident one of these days.
b. Pope John Paul II was so beloved that the entire world is now mourning the great man.

Condition C is faced with two types of challenges.

(i) *Explanatory Problem:* (a) First, it must be asked why Condition C should hold in the first place. In the classic theories of Chomsky and Lasnik (Chomsky 1981, Lasnik 1989), Condition C is stipulated. Reinhart 1983 tried to argue that Condition C derives from a general preference for binding over 'accidental coreference', but this preference itself does not follow directly from standard pragmatic principles (though it admittedly has a pragmatic flavor, in the sense that binding appears in a pre-theoretic sense to be more 'specific' than accidental coreference; but it is not trivial to cash this out formally). (b) Second, it must be asked why epithets escape some instances of Condition C. Although several analyses have attempted to describe formally the anaphoric behavior of epithets, none that I know of has tied their semantics to their syntactic behavior. In other words, no current account explains why it is that *those expressions that have an expressive component escape (some cases of) Condition C.*

(ii) *Empirical Problem:* On an empirical level, there are a host of exceptions to Condition C. Some of them have been discussed at some length by Reinhart and her followers, for instance (4):

(4) (Who is this man over there?) He is Colonel Weisskopf (Reinhart & Grodzinsky (1993))

If Condition C were applied blindly, the sentence would be predicted to be ungrammatical, since *he* and *Colonel Weisskopf* denote the same person. One line of

analysis, due to Heim (1993), is to make semantic values more fine-grained than is usual by introducing 'guises' or values of implicit descriptions ('individual concepts') under which various denotations are apprehended. In the case at hand the implicit descriptive content of *he* may be something like *the man you just pointed at*, which is probably different from the usual descriptive content associated with *Colonel Weisskopf*. But there are other cases which have not been formally analyzed so far:

(5) a. **A linguist working on Binding Theory** was so devoid of any moral sense that **he** forced a physicist [working on particles] to hire **the linguist**'s girlfriend in his lab.
b. **John Smith** was so devoid of any moral sense that **he** forced Peter Smith to hire **John**'s girlfriend in his lab

In each case the expressions in bold are understood as coreferential. Thus *the linguist* in a. and *John* in b. are both c-commanded by a coreferential pronoun, which should lead to the most severe variety of Condition C effect. But for most speakers both sentences are acceptable. Intuitively, what is going on is that the definite description serves a disambiguating function that the possessive pronoun *his* could not fulfill. Specifically, if the embedded expression were *his girlfriend* there would be an ambiguity as to whether *his* denotes the linguist or the physicist (resp. John or Peter). This intuition is confirmed by the observation that the sentences degrade markedly when the underlined expression is replaced with *me*:

(6) a. ***A linguist working on Binding Theory** was so devoid of any moral sense that **he** forced me to hire **the linguist**'s girlfriend in his lab.
b. ***John Smith** was so devoid of any moral sense that **he** forced me to hire **John**'s girlfriend in his lab

Since *his* carries third person features, it could not be coreferential with *me* in (6). As a result, replacing *his* with an R-expression does not produce any additional disambiguation, which might account for the deviance of both example[1]. Further exceptions to Condition C will be discussed below.

We will seek to solve both the Explanatory Problem and the Empirical Problem by reducing Condition C to a Gricean maxim of minimization (Minimize Restrictors!), which specifies that a definite description the A B is deviant if A could be dropped without affecting (i) the denotation of the description, and (ii) its various pragmatic effects. Thus the short (American) President is deviant if it is assumed that there is a single (American) President, as short contributes neither to (i) nor to (ii). By contrast, the stupid (American) President is entirely natural: although stupid does not affect (i), it contributes pragmatic information about the speaker's (negative) attitude towards its denotation. If pronouns are treated as short descriptions and if the semantics is set up in a slightly non-standard fashion, Part (i) of Minimize Restrictors! can derive the standard cases of Condition C. Furthermore, Part (ii) accounts for some exceptions to Condition C. First, an element that fails to affect the denotation of the description may still have an expressive component that suffices to justify it, as is the case with epithets: the idiot (or for that matter the great man) serves to express the speaker's attitude towards the

[1] Klaus Abels (p.c.) suggested that these examples might be analyzed, as involving Rizzi's principle of 'relativized minimality'. I leave this possibility open for future research.

denotation of the description. Second, an element may serve a disambiguating function, as is the case in (5), though not in (6).

Specifically, the structure of our theory is as follows.

A. *Minimize Restrictors!* is motivated by the contrasts in (7), which have nothing to do with Condition C as commonly analyzed since a single referring expression appears in the relevant sentences:

(7) a. The President made important mistakes.
b. The American President made important mistakes. (ok if other presidents were mentioned in the discourse)
c. #The small American President made important mistakes.
d. The stupid American President made important mistakes.

Minimize Restrictors! is presumably a special case of a Gricean principle, probably what Levinson 1998 calls the 'Maxim of Minimization', which he states as the following injunction: *Produce the minimal linguistic clues sufficient to achieve your communicational ends.* Of course it should be shown in detail how the Maxim of Minimization derives *Minimize Restrictors!*, but for present purposes we will be content to presuppose the latter principle.

B. In order for *Minimize Restrictors!* to have some bite in the Condition C cases we will consider, we will have to analyze pronouns as very short descriptions. The idea that pronouns can behave like descriptions is by no means new. It is most strongly supported by so-called 'paycheck' sentences, as in (8):

(8) The man who gave his paycheck to his wife was wiser that the man who gave it to his mistress.

Analyzing *it* as a variable ranging over objects would appear to be quite difficult in this case; a more promising line is to treat the pronoun as going proxy for the definite description *his paycheck,* which makes the analysis far less problematic. In 'donkey' sentences, such as (9)a, some researchers believe that the pronoun *it* also goes proxy for a description:

(9) a. Every farmer who owns a donkey beats it.
b. Few students came to the party but they had a good time.

Specifically, proponents of the so-called 'E-type analysis' of anaphora contend that *it* has the same semantics as the description *the donkey he owns.* In fairness, however, many other researchers -proponents of 'DRT analyses'- would deny that this is the case; by treating the semantics of indefinites in a non-standard way they allow the pronoun *it* to be analyzed as a simple variable. Still, believers of both the E-type and the DRT analysis posit that pronouns can have the semantic behavior of descriptions in cases such as (9)b, where *they* is believed to go proxy for the description *the students who came to the party* (whether this is implemented in a syntactic or in a semantic fashion is a further question, which we leave aside).

Once the option of analyzing pronouns in this way is open for some examples, we might as well analyze all pronouns as descriptions, though the choice of the restrictor may vary. In the cases we will consider, the pronoun will correspond to an extremely short description, which by Minimize Restrictors! will have to be preferred to any full

description whenever this modifies neither the semantics nor the pragmatics of the resulting sentence.

In accord with Geurts 1999, we will also extend this theory to proper names. Geurts observed that in some cases a proper name, say Bambi, fails to be rigid and behaves like a donkey pronoun:

(10) If a child is christened 'Bambi', and Disney Inc. hear about it, then they will sue Bambi's parents. (Geurts 1999)

The extension will be crucial to explain why proper names fall under Condition C in the same way as standard definite descriptions.

C. Finally, in order to provide a link between the unembedded and the embedded applications of *Minimize Restrictors!*, we will have to explain *how the context of utterance can be dynamically modified in the course of the interpretation of a sentence.* The main thrust of the proposal is that the very same constraint applies to a description in its extra-linguistic context and in its intra-linguistic context. In order to implement this idea, we will need a formal notion of 'intra-linguistic context', which we will obtain by constructing sequences of evaluation in a non-standard way. The technique is inherited from the so-called 'de Bruijn notation' of the λ-calculus, but it has already had several applications in the analysis of anaphora (see among others Dekker 1994, Ben-Shalom 1996, van Eijck 2001, Bittner 2001, 2003, and Schlenker 2005a).

The claim that constraints on coreference are pragmatic in nature is by no means new; in fact, it was probably one the first ideas that came to mind when these constraints were initially discussed.

-In a pragmatic vein, Bolinger (1977, 1979) explored the view that an NP can appear 'to the right' of a coreferential pronoun if 'it answers to some need at that point for more semantic information than the bare minimum: to avoid ambiguity, to reidentify a prior referent that is distant either in space (length of utterance) or in grammar (...), to emphasize the nature of the referent (...), or to reintroduce the referent as topic. *Apparent syntactic restrictions are only symptoms of pragmatic restrictions'*[2]. Although Bolinger had something very close to *Minimize Restrictors!*, he did not integrate it into a framework that could derive the role that c-command plays for Condition C. Levinson 1998, 2000 also explores some appealing pragmatic analyses of Condition C, but along with Bolinger he fails to derive the role of c-command.

-After it was discovered (largely by Reinhart herself) that Condition C *should* in fact be stated in terms of c-command, Reinhart (1983) argued that the constraint results from a pragmatic principle that requires that binding be preferred over 'accidental coreference' to achieve any given reading. Once it was observed that binding itself requires c-command, Reinhart was in a position to explain why c-command plays a role in Condition C as well (in non-c-command cases, binding is impossible, and hence the pragmatic principle is vacuously satisfied). What Reinhart did not have, however, was a principle akin to *Minimize Restrictors!* to establish a connection between Condition C and, say, the deviance of *the small American president.* Likewise, the preference for

[2] Special thanks to Bart Geurts for pointing out the relevance of Bolinger's work in the present context and for making some of his papers available to me.

binding over accidental coreference cannot explain the data in (5)-(6), nor can it explain why a sentence similar to (7)a becomes bad again if *the linguist* is replaced with *the linguist working on Binding Theory:*

(11) ??**A linguist working on Binding Theory** was so devoid of any moral sense that **he** forced a physicist [working on particles] to hire a friend of **the linguist working on Binding Theory** in his lab.

By contrast, the *Minimize Restrictors!* theory has no trouble accounting for this new fact: the embedded definite descriptions contains idle material that does not play any role of disambiguation, since the sentence would be just as unambiguous if *working on Binding Theory* were dropped altogether from the definite description. Of course one could argue that both *Minimize Restrictors!* and Reinhart's principle must be assumed. But this is not necessary. As we will see, *Minimize Restrictors!* can be made to do all the work once the semantics is set up in the 'right' way.

-Finally, let us mention two recent proposals that come very close to the present analysis. In unpublished work and lectures, Barry Schein explicitly explored the view that Condition C derives from *Minimize Restrictors!* I am not sure whether he derived the role of c-command, and apparently he did not discuss cases such as (5)-(6), but the spirit of the present proposal is clearly related to his analysis. Safir 2004 also proposes a related principle, which is not directly pragmatic but which often makes the same predictions as the present one. His principle is that one should *prefer the most dependent form* available, where reflexive pronouns are more dependent than non-reflexive pronouns, which are themselves more dependent than R-expressions. One arguable advantage of his proposal is that, unlike the present theory, it derives Condition B. One disadvantage is that it does not motivate the principle on pragmatic grounds, and therefore fails to connect Condition C to the examples in (7).

2 *Minimize Restrictors!* and the extra-linguistic context

In this section we motivate *Minimize Restrictors!* by considering pragmatic constraints on unembedded definite descriptions and pronouns. Only the extra-linguistic context will play a role in this discussion. Starting in Section 3, we will see how *Minimize Restrictors!* also constrains the relation between a description and the intra-linguistic context, which will derive Condition C and some exceptions to it.

2.1 Definite Descriptions

Basic Cases

The basic data designed to motivate *Minimize Restrictors!* were already introduced in (7). Let us add a couple of telling contrasts:

(12) a. ??John's blond father has arrived
b. John's blond brother has arrived.
c. John's idiotic father has arrived.

(12)a is deviant unless one assumes that John has several fathers (... which might happen if John is an adopted child, and thus has a natural father and an adoptive father. I believe that in this case the sentence is quite natural). But in the more usual situation in

which John has only one father, the adjective *blond* could be dropped without modifying the denotation of the description. Furthermore, unless you have a keen interest in people's hair color, the adjective is unlikely to produce any significant pragmatic effect. As a result, the description violates *Minimize Restrictors!* and is thus deemed deviant. (A prediction of this analysis is that if you *do* have a keen interest in a father's hair color the sentence might become more acceptable. This would have to be tested more extensively...).

(12)b is acceptable if it is known that John has several brothers, exactly one of whom is blond. If it is known that John has a single brother, the expression typically becomes deviant, for the reasons we outlined for case a.

Finally, (12)c is acceptable because although *idiotic* could be dropped without affecting the denotation of the description, it provides information of a different sort about the speaker's (negative) attitude towards John's father.

These observations naturally lead to the following definition of *Minimize Restrictors!*:

(13) Minimize Restrictors!
A definite description *the A B* [where the order of *A* vs. *B* is irrelevant] is deviant if *A* is redundant, i.e. if:
(i) *the B* is grammatical and has the same denotation as *the A* (=Referential Irrelevance), and
(ii) A does not serve another purpose (=Pragmatic Irrelevance).

Referential irrelevance is easy to compute given any explicit semantics. On the other hand Pragmatic Irrelevance is entirely open-ended. A full analysis would have to provide independent criteria to test it, as well as a precise theory of the pragmatic effects that can license a modifier that is referentially irrelevant. In the present notes, however, we will have a much less ambitious goal: we will only seek to describe the phenomena in enough detail to a draw a connection between *Minimize Restrictors!* and Condition C.

Pragmatic (Ir)relevance

Naturally, a variety of factors can enter in the computation of Pragmatic Irrelevance. Considered from the hearer's perspective, the general problem is -very roughly- as follows:

i) The speaker uttered *the A B*

ii) Semantically, this presupposes that there is exactly one object that satisfies both A and B. [In our final analysis, we will treat *the A B* as presupposing only that there is exactly one most salient object that satisfies both A and B; but this does not affect the rest of the argument].

iii) It is also presupposed that there is exactly one object that satisfies *B*, and hence that *the A B* denotes the same object as *the B*. But then why did the speaker decide to utter *the A B* rather than *the B*, which is shorter? Some possibilities are as follows:

1) *Accommodation and Expressive Meaning*

The speaker may wish to force me to *accommodate* the information that the B-object also satisfies *A*. This, in turn, might be:

a) because it is *quicker* to do so than to assert (in a separate clause) that *the B is A.* We would expect this case to arise with particular frequency in speech situations in which space is limited, as in newspaper articles. The following was found in a film review:

(14) A young American poetess is left by her French husband for the Czechoslovakian wife of an American lawyer[3]

(Certainly one need not understand that the poetess has several husbands, nor that the lawyer has several wives; infidelity is not polygamy, after all.)

b) because the speaker does not wish to present the information that *the B is A* as asserted so as not to allow the addressee to respond to it (for instance because it might distract from the main point of the conversation).

The following example, which seems to me to be felicitous even if it is known that the speaker has only one daughter, probably combines points a) and b):

(15) So you are a compassionate Republican? Well, my lesbian daughter doesn't think that Republicans are so compassionate these days.

(It is certainly *quicker* to assert the second sentence than to say: *My daughter is a lesbian. And she doesn't think Republicans are so compassionate these days.* In addition, the latter sequence would allow the addressee to ask all sorts of questions about the daughter's sexual orientation, which might distract from the speaker's main goal, which is to cast doubt on the coherence of the concept of a 'compassionate Republican').

c) because the speaker knows that I have no reason to challenge the assumption that *the B is A.* This might for instance be because the speaker knows that I know that only he has evidence as to whether *the B is A.* I would submit that this case arises in particular with *expressives,* which by definition are used to provide information about the speaker's (positive or negative) attitude towards an object. Potts 2003 has argued that expressive content should be treated as a new dimension of meaning, with its own composition rules, so to speak. This analysis is presumably compatible with the observation that expressive modifiers are authorized by *Minimize Restrictors!* even when they are referentially irrelevant, since they provide a different kind of pragmatic information.

I believe that the same conclusion can also be derived if one has a more conservative treatment of expressive content, according to which it is a particular kind of presupposition, which differs from other presuppositions in that it *invites accommodation.* This would be natural in view of the fact that the speaker should know what his attitude towards an object is, and thus that the addressee would be foolish to challenge such information. On this analysis the role played by expressives would simply be to *trigger the accommodation* of some information about the speaker's attitude. This line of analysis might be supported by the observation that with respect to

[3] From a review of James Ivory's *Le Divorce,* at:

http://parisvoice.com/03/oct/html/showtime/movie.cfm

our data, he expressive or non-expressive behavior of a modifier is not a *lexical* property of the modifier in question, but is determined by the context. Thus Barry Schein (p.c.) notes the following contrast:

(16) a. ?The tall French President has just entered the room
b. The tall, handsome French President has just entered the room.

Uttered out of the blue, (16)a is somewhat deviant. Adding *handsome* to the description, as in (16)b, makes it clear that *tall* is evaluative, which in turn makes the entire description acceptable. I suspect that the same effect can in fact be achieved if (16)a itself is uttered in a context in which it is clear that the President's height is ground for admiration.

(I have even talked to informants who find that *John's blond wife is a doctor* is acceptable, presumably because they treat *blond* as an evaluative modifier...)

2) *Reminders and intentional redundancy*

Another kind of situation is one in which it is presupposed that exactly one object satisfies *B*, but the speaker wishes to *remind* me that this object also satisfies *A*.

(17) Dr. Heidegger, do you realize what the situation is? Under the regime you support your Jewish Assistant will not be allowed to work for you any more!

(The sentence appears to me to be quite acceptable even if it is presupposed that Heidegger has only one assistant).

A related case is one in which the speaker has doubts about the addressee's ability to understand what he says, and thus goes out of his way to include redundant information, as is the case in (18):

(18) Let me remind you that my father is an arch-Republican. And my Republican father is certainly not going to give a dime to Move-on.org...

3) *Formal niceties*

Finally, etiquette sometimes requires that a full title be used to refer to someone (presumably because the nature of the title is specified in a pre-established rule, and that one can conform to the rule only by using the *precise* title that it specifies). This situation naturally arises in highly formal speech situations:

(19) [Uttered before the State of the Union Address:]
Ladies and gentlemen, the President of the United States!

(Even though there is probably no more than one president in the domain of discourse when (19) is uttered, the full description is presumably acceptable because one should speak of the President using his full official title).

2.2 Pronouns

If we treat pronouns as very short descriptions, we would expect that *Minimize Restrictors!* should in some cases prohibit the use of a full description. In order to implement this idea, we will have to say in greater detail what it means that a pronoun is

a 'very short' description. For the time being, however, let us simply observe that there are indeed cases in which the phenomenon is attested.

1) Prohibition against R-expressions that denote the speaker or addressee

As was mentioned in a different context in Schlenker 2005a (and no doubt by many others), one cannot normally use a proper name or a definite description to refer to the speaker or addressee:

(20) Context: John, who is the syntax professor, is speaking to Mary, who is the semantics professor.
a. #John is happy.
a'. I am happy.
b. #Mary is happy.
b'. You are happy.
c. #John's mother is happy.
c'. My mother is happy.
d. #Mary's mother is happy.
d'. Your mother is happy.
e. #The syntax professor is happy.
f. #The semantics professor is happy.

As is expected given the present analysis, there are various exceptions to this rule, which can all be accounted for because the referential irrelevance of the restrictor is compensated by its pragmatic relevance.

- *Reminders:* Daniel Vanderveken (p.c.) mentions French examples in which a full description provides the sentence with an illocutionary force that the mere pronoun would not contribute:

(21) [John is smoking. His father tells him]:
Ton père t'ordonner d'arrêter de fumer immédiatement!
Your father orders you to stop smoking at once!

(This would seem to have approximately the same force as: *I am your father and I order you to stop smoking at once!*)[4]

- *Formal niceties:* There are also cases in which a first or second person pronoun are socially inappropriate, either because they sound too subjective or because politeness requires that a full title be used. The first case is illustrated in (22), which would appear to be licensed by the idea that a reviewer should not write in the first person (possibly because his opinion should appear as 'objective'; there might also be an illocutionary component to the restrictor *reviewer*):

(22) In this reviewer's opinion, the paper is unsuitable for publication[5].

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[4] For a related example, consider the sentence *The Chair adjourns the meeting,* uttered by the Chairman at the end of a faculty meeting. Presumably a meeting can only be adjourned by the Chair, and thus this sentence does not have the same illocutionary force as: *I adjourn the meeting.*

[5] Another interesting example is provided by the following quote from a *New Yorker* piece by John Updike on the new Museum of Modern Art in New York:

(i) "It is not easy, while gingerly stepping over loose floorboards and extension cords as thick as boa

The second case is illustrated in (23), where the speaker addresses a Queen:

(23) Is her Majesty satisfied with the Government's work?

2) Prohibition against R-expressions that denote 'super-salient' entities

I would further suggest that the prohibition against R-expressions that denote the speaker or addressee is in fact a special case of a more general rule: entities that are extremely salient ('super-salient', as I will say) should always be denoted with a pronoun, not with an R-expression (... unless this serves some other pragmatic purpose). What is special about the speaker and addressee is that they are *always* super-salient, whereas people denoted with third person expressions may or may not be super-salient, depending on the context. Still, even in the latter case a full description is sometimes a bit odd, though the judgments are admittedly subtle. One example was provided by Roumi Pancheva (p.c.) [slightly modified]:

(24) [A professor and her Teaching Assistant are grading a late exam together. After both of them have looked at some length at the exam, the professor says:]
a. <?>The student should pass.
b. He should pass.

Even though there is exactly one student in the discourse situation, the description *the student* appears to be overly specific; the student in question is so salient that the pronoun *he* must in this case be preferred to the full description.

Other cases can be found as well, though the judgments are somewhat delicate, presumably because it is difficult to 'force' an entity to be super-salient (a cooperative hearer will try to come up with a context in which the entity is not super-salient so as to justify the use of a full description):

(25) [I have just test-driven a car. While still in it, I say:]
a. <?>The car drives well
b. It drives well (T. Gibson, p.c.)

(26) [The speaker and the addressee have both examined the same watch for several minutes]
a. <?>The watch is broken.
b. It's broken.

As in our earlier examples, expressive meaning (and presumably many other pragmatic factors as well) can 'save' a description that would otherwise be overly specific. Thus in the situation of (26) one could still utter felicitously:

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constrictors, to picture the new Museum of Modern Art in every tidy and clean-swept detail, but enough was on view last month to persuade this visitor that the final effect will be immaculate, rectilinear, capacious, and chaste'. (John Updike, 'Invisible Cathedral', New Yorker, Nov. 15, 2004, p. 106)

In this case *this visitor* might also serve to establish a possible contrast with other visitors. If so the use of the description would in this case serve to emphasize the *subjective* character of the pronouncement.

(27) The stupid watch is broken.

This is exactly as is expected given Part (ii) of *Minimize Restrictors!*

3 Minimize Restrictors! with respect to the intra-linguistic context.

Let us now discuss the effects of *Minimize Restrictors!* with respect to the intra-linguistic context. Our basic hypothesis will be this:

-As a sentence is processed, top-down, the sister-to-sister relations that are found in the syntax are semantically analyzed with respect to a context which is dynamically constructed.

-The initial context is a sequence of objects that only includes the speaker, the addressee and any other 'super-salient' entities. Each time a pronoun or an R-expression which denotes d is processed in a context c, its sister is evaluated with respect to c^d, which is the context c to which d has been added. In other words, processing an R-expression has the effect of making it 'super-salient' for the expressions that are contained within its sister. This procedure will be seen to derive the role that c-command plays for Condition C.

-Whatever pragmatic rules constrain the relation between an expression and its extra-linguistic context also constrain its relation to its intra-linguistic context.

Within this framework, then, a context always includes those objects which, at a given point in the analysis of a sentence, are 'super-salient'. *Minimize Restrictors!* will require that these super-salient entities be denoted using a pronoun, *unless* some special pragmatic effect is obtained by using a full description.

Since the basic cases of Condition C were already discussed at the beginning of these notes, we shall not discuss them again until we provide a formal account. So we start right away with the exceptions.

3.1 Epithets

Dubinsky & Hamilton's Analysis

There are various accounts of the behavior of epithets with respect to Condition C. We will follow the theory of Dubinsky & Hamilton 1998, according to which *epithets behave exactly like pronouns with respect to Condition C, except in attitude reports.* According to Dubinsky & Hamilton, the 'except' clause stems from the fact that epithets are really *anti-logophoric pronouns,* i.e. pronouns which, in any attitude report, are interpreted as disjoint from the attitude holder (this is only an approximation of the facts, but for present purposes it will do).

-Let us start with some of Dubinsky & Hamilton's positive examples:

(28) a. John$_i$ ran over a man (who was) trying to give the idiot $_i$ directions (Dubinsky & Hamilton 1998)
b. How about John?
(?) He$_i$ ran over a man who was trying to give [the idiot]$_i$ directions

(29) Through an accumulation of slipups, John $_i$ (inadvertently) led his students to conclude that the idiot $_i$ couldn't teach. (Ok for Dubinsky & Hamilton 1998; O. Percus and G. Katz find the example slightly degraded)

As we noted earlier, the generalization does not simply apply to epithets, but more generally to Noun Phrases that have an evaluative component:

(30) [Pope John Paul II]$_i$ was so beloved that the entire world is now mourning [the great man]$_i$.

-In attitude reports, however, the data are different:

(31) a. #Melvin$_i$ claims that [the bastard]$_i$ was honest. (Dubinsky & Hamilton's (4))
b. # [Pope John Paul II]$_i$ did not expect that the entire world would mourn [the great man]$_i$.

-However Dubinsky & Hamilton argue that this fact has nothing to do with Condition C proper. Rather, epithets happen to behave like 'anti-logophoric' pronouns, which must be interpreted as disjoint from the agent of the attitude report even when no Condition C effect is present. They explain in this way the contrast between (32)a-b and (33)a-b (similar ideas were developed in Kuno 1972):

(32) a. *It was said by John$_i$ that the idiot$_i$ lost a thousand dollars on the slots.
b. It was said of John$_i$ that the idiot$_i$ lost a thousand dollars on the slots.
(Dubinsky & Hamilton 1998)

(33) a. *According to John$_i$, the idiot$_i$ is married to a genius.
b. Speaking of John$_i$, the idiot$_i$ is married to a genius.
(Dubinsky & Hamilton 1998)

In the a. examples, the second clause serves to report John's thought. Since epithets are anti-logophoric, *the idiot* must be interpreted as disjoint from John, which explains why the sentences cannot have the intended readings. By contrast, in the b. examples the second clause reports or expresses somebody else's thoughts, and *the idiot* can refer to John, as is expected.

Why should Epithets be Anti-Logophoric?

Of course the fact that epithets are anti-logophoric should in the end be derived. A possible strategy is as follows:

i) In order to analyze attitude reports in natural language, a distinction is needed between De Re and De Se readings (in addition to De Dicto readings, which do not enter in the present discussion). For presentational purposes it is expedient to start with the contrast between *PRO*, the unpronounced subject of an infinitive, which in attitude reports can only be read De Se, and *he*, which is ambiguously De Se or De Re[6].

(34) a. George hopes PRO to be elected
b. George hopes that he is elected

Morgan 1970 and Chierchia 1987 observed that there is an interpretive difference between (34)a and (34)b. Suppose that George is drunk, and has forgotten that he is a

[6] A similar discussion is included in Schlenker 2005b.

candidate in the election. He watches TV and sees a candidate that he finds appealingly reactionary, hoping that this person -none other than himself, as it turns out- should be elected. (34)b might provide a passable way of reporting truly this admittedly unusual situation; (34)a would not. Somehow (34)a requires that the candidate be in a position to utter the first person statement: *I should get elected.* The reading we obtained in this way has been called, after Lewis 1979 and Chierchia 1987, a 'De Se' reading. The reading in (34)b which is true in the situation at hand is the 'De Re' reading.

ii) Within English there are arguments that suggest that a De Se situation makes a De Re logical form true. Let us consider (following Zimmermann 1991) a group of candidates that includes George, who is in the very same situation as in the previous scenario. By contrast, each of the other candidates thinks about himself: 'I should be elected'. It is then possible to say:

(35) Each candidate (including George) hopes that he is elected.

-Could the embedded clause have a De Se Logical Form? No, because this would automatically require that the VP *hopes that* $he_{De\ Se}$ *is elected* hold true of each candidate, which by assumption is not the case since George's hope is of the form: *He should be elected.*

-Therefore the embedded clause must be read De Re. But since the other candidates each think *I should be elected*, they have a De Se hope. Still, the VP *hopes that* $he_{De\ Re}$ *is elected* (with a De Re embedded clause) is true of each of them. Therefore a De Re reading must be true in a De Se situation.

iii) Although pronouns such as 'he' are typically believed to be ambiguously De Se or De Re, languages such as Ewe (Clements 1975) display a morphological distinction between De Se pronouns, which are called 'logophoric', and De Re pronouns, which are called 'anti-logophoric'. But if the De Se analysis of logophoric pronouns is correct, given ii) we would expect that a coreferential reading should be possible in a De Se situation both with a logophoric and with an anti-logophoric pronoun. But this is not the case: the anti-logophoric pronoun yields a disjoint reference effect in an 'out of the blue' context (presumably a context in which one is reporting a speech of the form: 'I left', which corresponds to a De Se situation):

(36) a. kofi be yè-dzo (Ewe, Clements 1975)
Kofi say LOG-leave
'Kofi says that he (=Kofi) left'
b. kofi be e-dzo (Ewe, Clements 1975)
Kofi say he/she-left
'Kofi says that he (≠Kofi) left'

Thus an additional constraint is needed, one according to which *a De Se logical form should be used whenever this is compatible with the situation to be reported.*

iv) Now all we need to observe about epithets is that they cannot be read De Se. This will follow on any theory according to which De Se pronouns must always be variables, as is the case, for instance, in the classic theory developed in Chierchia 1987 [one could further try to *derive* this condition, but we leave this for future research].

3.2 Other Exceptions to Principle C

Let us now consider other exceptions to Principle C.

Formal Speech

First, formal speech may obviate Condition C, as is seen in (37):

(37) a. The King of Transsylvania requests that his Majesty's ministers join his Majesty in Room Rosa Luxemburg.
b. His Majesty will not hesitate to put to death any person who insults his Majesty's forefathers.

Disambiguation

Second, disambiguation can suffice to justify a definite description. The basic Condition C contrast is shown in (38):

(38) a. #**A linguist working on Binding Theory** was so devoid of any moral sense that he hired **the linguist**'s girlfriend in his lab.
b. **A linguist working on Binding Theory** was so devoid of any moral sense that he hired **his** girlfriend in his lab.

In (39), we see that the description *the linguist* becomes acceptable if it serves to disambiguate between two possible antecedents

(39) a. **A linguist [working on Binding Theory]** was so devoid of any moral sense that **he** forced a physicist [working on particles] to hire **the linguist**'s girlfriend in his lab.
b. **A linguist working on Binding Theory** was so perverse that **he** forced a physicist [working on particles] to hire **the physicist**'s girlfriend in his lab.

As expected, if we replace the underlined expression with a first person pronoun, the sentence with *the linguist* becomes bad again, because the description does not disambiguate the sentence any more than a third person possessive pronoun would (since the 'intervener' is a first person pronoun):

(40) ??**A linguist working on Binding Theory** was so devoid of any moral sense that **he** forced me to hire **the linguist**'s girlfriend in his lab.

More tentatively, we may observe that the anaphoric definite description must not contain material beyond what is necessary to disambiguate the sentence. Thus in (41)a the description *the linguist working on Binding Theory* is overly specific because the last four words could have been dropped without making the sentence more ambiguous (the judgments are delicate, and remain to be confirmed):

(41) a.?? **A linguist working on Binding Theory** was so devoid of any moral sense that **he** forced a physicist [working on particles] to hire **a friend of the linguist working on Binding Theory** in his lab.

b. ? **A linguist working on Binding Theory** was so devoid of any moral sense that **he** forced a linguist working on morphology to hire **a friend of the linguist working on Binding Theory** in his lab.

To my ear, the example in (41)b is more acceptable because there are now two linguists that have been introduced in the discourse, so that the long description *the linguist working on Binding Theory* plays a function of disambiguation.

Disambiguation and Reinhart's Preference for Bound Readings

Reinhart 1983 sought to derive Condition C from a preference for bound readings over 'accidental coreference'. However the examples of anaphoric descriptions that we gave clearly violate her principle, as shown in (42):

(42) a. John was so devoid of any moral sense that he forced Peter to hire John's sister in his lab.
b. ? Only John was so devoid of any moral sense that he would force Peter to hire John's sister in his lab.
=> only strict reading.
c. Only John was so devoid of any moral sense that he forced Peter to hire his sister in his lab.
=> strict and sloppy reading.

Even though (42)a is acceptable, it appears not to yield a 'bound reading', as suggested by (42)b (which contrasts in this respect with (42)c). I conclude that Reinhart's principle cannot account for the acceptability of the examples under discussion.

'Old' vs. 'Recent' Antecedents

A final point is that disambiguation does not consider all the conceivable antecedents that have been introduced in a sentence, but only the relatively recent ones. The data should definitely be investigated in greater detail, but it seems to me that there is a contrast between the following examples:

(43) [Linguists have no moral standards]
a. **A linguist [working on Binding Theory]** was so devoid of any moral sense that **he** forced a physicist [working on particles] to hire **the linguist**'s girlfriend in his lab.

b. **A linguist [working on Binding Theory]** was so devoid of any moral sense that **he** forced a physicist [working on particles] to hire **his** girlfriend in his lab.

c. <?> A mathematician I once met at a party worked at a university where **a linguist working on Binding Theory** hired **the linguist**'s girlfriend in his lab.

d. A mathematician I once met at a party worked at a university where **a linguist working on Binding Theory** hired **his** girlfriend in his lab.

If the contrast is real, it might stem from the fact that the antecedent *a mathematician...* is too far from *his* to be a plausible antecedent, with the result that the sentence with *his* is already 'sufficiently' unambiguous, which makes the less economical description *the linguist* unnecessary and the pronoun mandatory. Obviously the role played by 'distance' should be further investigated in future research.

3.3 The Status of Disjoint Reference

By its very nature, *Minimize Restrictors!* rules out a sentence only in case there is 'more economical' competitor which achieves the same truth conditions. When no competitor is available, we predict that Condition C should be obviated. This appears to be the case in the following examples, which have the property that the plurality of the matrix subject makes it impossible for a singular pronoun to be anaphoric on them:

(44) a. The Clintons are both convinced that Hilary will be elected in 2008.
b. #The Clintons are both convinced that Hilary Clinton will be elected in 2008.
c. #Hilary is convinced that Hilary will be elected in 2008.

In these examples, an R-expression is licensed even though it overlaps in reference with the matrix subject, in violation of the version of Binding Theory developed by Chomsky and Lasnik, which prescribed that an R-expression should not overlap in reference with any c-commanding expression (e.g. Lasnik 1989). Importantly, the embedded R-expression should not contain any redundant material. This is presumably what accounts for the deviance of (44)b. In (44)c, we regain a standard Condition C violation, because in this case the 'short' description *she* is to be preferred over the longer description *Hilary.* [In addition, this example is ruled out by the Preference for De Se readings which was discussed earlier].

We note for completeness that the contrasts hold just as well when the matrix subject is a pronoun, a fact which is interesting since this is normally the situation in which a Condition C effect is most severe. Nonetheless (45)a is entirely acceptable:

(45) a. How about the Clintons? What do they expect for 2008?
-They are both convinced that Hilary will be elected.
b. How about the Clintons? What do they expect for 2008?
-#They are both convinced that Hilary Clinton will be elected.
c. How about Hilary? What does she expect for 2008?
-#She is convinced that Hilary will be elected.

Similar examples can be produced with examples that involve larger groups rather than couples, and proper names rather than definite descriptions:

(46) a. The Seven Dwarves are all convinced that the youngest among them will eventually marry Snow White.
b. The Seven Dwarves are all convinced that Dopey will eventually marry Snow White.
c. How about the Seven Dwarves?
They are convinced that Dopey/the youngest among them will eventually marry Snow White.

d. How about Dopey?
#He is convinced that Dopey will eventually marry Snow White.

4 Sketch of a formal account

4.1 Principles

In order to implement the theory we have started to sketch, we need a formal device that can encode both c-command relations and the *hierarchical order* in which discourse referents are introduced, since we saw earlier that a description may be licensed in violation of Condition C if this serves to disambiguate between antecedents that are 'not too far' (this assumes that the contrast in (43) is real; if it is not, alternative theoretical options might become available). Standard assignment functions, which give values to indices of bound and free pronouns alike, cannot encode the necessary distinctions. This is because an assignment function simply associates certain values to certain variables; it may for instance have the form $he_1 \rightarrow$ John, $he_2 \rightarrow$ Peter, etc. But this neither tells us whether at the point at which this assignment function is accessed, say by a pronoun he_3, he_1 is or is not in a c-commanding position; nor does it tell us whether he_1 c-commands he_2 or vice-versa.

It is possible, however, to construct assignment functions in such a way as to encode all the information we need. This system, known in the λ-calculus as the 'de Bruijn' notation, has been applied to the analysis of anaphora by quite a few semanticists, including Dekker 1994, Ben-Shalom 1996, van Eijck 2001, Bittner 2001, 2003, and Schlenker 2005a (see Barendregt 1984, pp. 579-581 for a very brief introduction to the De Bruijn notation). The system we will develop here is simpler than that of Schlenker 2005a, in that we give a single interpretive rule for all referential expressions (be they pronominal or nominal). By contrast, in Schlenker 2005a different rules were introduced (this had the advantage of accounting for Condition B, which we entirely disregard in the present paper.)

Using the vocabulary of 'sequences of evaluation' rather than of 'assignment functions', we will pursue the intuition that a sequence represents the *linguistic context* with respect to which an expression is evaluated. The context is built incrementally as a sentence is processed, top-down, in accordance with the following rules (in what follows a 'context' is a sequence of objects, which starts with a world and is followed by an arbitrary number of individuals):

(47) (i) The initial context c* only includes a world parameter, followed by the speaker and addressee, followed by those entities that are 'super-salient' in the discourse (we will come back to this notion). In other words, c* is of the form: $c^*=w^\frown s^\frown h^\frown e_1{}^\frown ...{}^\frown e_n$, where w is the world parameter, s is the speaker, h is the adddresseee, and e_1 ... e_n are the super-salient entities (if any).
(ii) If α is a referential expression (be it a pronoun, a proper name or a definite description), we have:
$[\![[\alpha\ \beta]]\!] c = [\![[\beta\ \alpha]]\!] c = [\![\beta]\!] c^\frown([\![\alpha]\!]c)$
where $c^\frown([\![\alpha]\!]c)$ is the result of 'adding' the value of α to the sequence c.

In accordance with this simple rule, the sequence of evaluation will represent at each point:

(a) what is the world of evaluation

(b) who is talking to whom

(c) which entities are more prominent than which entities, where 'more prominent' means either i) more salient, or ii) denoted by an expression in a c-commanding position.

To give an example, if John is talking to Mary and no other entities are 'super-salient', the initial sequence of evaluation will be of the form wˆjˆm. If in addition Peter is 'super-salient', the initial sequence will be wˆjˆmˆp.

We still need to say how the value of various referential expressions are computed.

(48) (a) Anaphoric and indexical pronouns carry negative indices, and obtain their value from the sequence of evaluation, in accordance with the following rule:
[[-i]] c =c_{-i}, where c_{-i} is the i^{th} element of c counting from the end if such an element exists and is not a world, and # otherwise.

(b) By contrast, demonstrative pronouns carry positive indices, and obtain their value from a demonstration, encoded in a separate function (=the Demonstrative function, D for short), in according with the following rule:
[[i]] c =D(i)

(c) Definite descriptions (be they 'standard' descriptions or proper names, analyzed as abbreviated descriptions) obtain their values in the usual way, except that we take *the P* to denote the <u>most salient</u> P-individual, in accordance with the following rule:
[[[the N']]] c=# iff there isn't a <u>most salient</u> d (according to c) satisfying [[N']] cˆd=1.
If ≠#, [[[the N']]] c=the <u>most salient</u> d (according to c) satisfying [[N']] cˆd=1

(d) Salience according to a sequence c:
a. Elements that are in c are more salient that than those that aren't.
b. Elements that are closer to the end of c are more salient than those that are further away.

Some comments are in order.

Ad (a) and (b): The distinction between negative and positive pronouns allows us to encode formally the contrast between 'accidental coreference' and 'binding', which was forcefully argued for by Reinhart 1983. Thus in *His_1 mother likes John* the possessive pronoun *his_1* can be evaluated with respect to a sequence of evaluation that does *not* contain John, for the simple reason that positive indices obtain their value from a different function, the 'demonstrative function' D. By contrast, in *Peter likes his_{-1} mother* the possessive pronoun recovers its value from the sequence of evaluation, which will be of the form wˆjˆmˆpˆ... on the assumption that John is the speaker and Mary is the addressee.

Ad (c) and (d): We make use of a modification of the semantics for definite descriptions argued for in von Heusinger 1994. In standard analyses, inspired by Frege and Strawson, *the P* denotes the maximal P-individual, and yields a presupposition failure if there is no unique object that qualifies as a maximal P-individual (this object may be singular or plural). When *P* is singular, *the P* yields a presupposition failure unless there is exactly one P-individual (this is because in this case there are several objects that are maximal individuals satisfying *P*). When *P* is plural, *the P* yields a presupposition failure unless there are at least two P-individuals in the domain of discourse; and if it is admissible, the description denotes the sum of all P-individuals. However, this analysis faces serious difficulties, as suggested by the examples in (49)-(50):

(49) The dog is barking, but the neighbors' dog isn't.

(50) [There are ten girls and ten boys in the class. Three girls raise their hands. Talking to the speaker, I say:]
a. Wait, the girls have a question!
b. #Wait, every girl has a question! (P. Svenonius, p.c; see Schlenker 2004)

In (49) it would seem that there are two dogs in the domain of discourse, and yet *the dog* is acceptable. In (50), *the girls* can denote the three salient girls that raised their hands. By contrast, *every girl* has no choice but to quantify over all ten girls in the domain of discourse. These facts are unexpected given the standard analysis. By contrast, if one posits that *the P* denotes the *most salient* P-individual (in the case of a plural: the most salient plural P-individual), the facts are easily explained. (48)c makes use of this analysis in the singular case, and (48)d specifies that elements that appear in a sequence of evaluation c count as 'more salient' (according to c) than those that don't, and that elements that are more 'recent' (i.e. which appear closer to the end of the sequence) are more salient that elements that are less so.

Before we can come to the examples themselves, we need to say briefly how predicates, modifiers and some embedded clauses are analyzed. Modifiers and embedded clauses are treated in an entirely standard fashion, as coordination and as abstraction over worlds respectively. Predicates are more interesting. Due to the non-standard way in which sequences are constructed, we can recover from a sequence c all the information that is necessary to evaluate a predicate as true or false. If P takes a single argument, it is true under c just in case the last element of c, written below as c_1, satisfies P in the world of c, written below as c_w. If P takes two arguments, it is true under c just in case the pair of the last two elements of c, written below as c_2, satisfies P in the world of c. The general rule is given in (51)c:

(51) *Notational conventions:* If c is a context and n is a non-null integer, c_n=# if the length of c is <n+1 or if one of the last n elements of s is #; otherwise c_n=the sequence of the last n elements of s. c_w is the world of c, i.e. its first coordinate.

(a) If P is an n-place predicate,
$[\![P]\!] c = \#$ iff $c_n = \#$. If $\neq \#$, $[\![P]\!] c = 1$ iff $c_n \in I_{c_w}(P)$

(b) If P and P' are two predicates,
$[\![P\ P']\!] c = \#$ iff $[\![P]\!] c = \#$ or $[\![P']\!] c = \#$. If $\neq \#$, $[\![P\ P']\!] c = 1$ iff $[\![P]\!] c = 1$ and $[\![P']\!] c = 1$

(c) [[to VP]] c=λw' [[VP]]c[c_w/w']
where c[c_w/w'] is just like c except that its world coordinate is replaced with w'.

Our last principle, *Minimize Restrictors!*, is stated in (52). It is admittedly partial, in the sense that it will have to be specified further to apply to quantified examples. But for present purposes it will do. It is intended to apply to explicit descriptions, such as *the small President,* as well as to proper names and pronouns. *John* is taken to be short for *the John*, where *John* is a predicate true of exactly one individual (namely John). *he*$_{-1}$ is taken to be short for *the =-1*, i.e. the individual identical to -1; and similarly *he*$_1$ is short for *the =1.*

(52) Minimize Restrictors!
In a definite description *the A B* [where B can be null; the order of A and B is indifferent], the description is deviant if A could be eliminated and replaced, if necessary, with a combination of negative indices and =,
a. without changing the reference of *the A B* or making the sentence ungrammatical, and
b. without changing the pragmatic effect of *the A B*

As stated, *Minimize Restrictors!* encodes the assumption that anaphoric and indexical pronouns can be added to a Logical Form 'for free', whereas demonstrative pronouns are 'costly'. The intuitive motivation behind this hypothesis is that demonstrative pronouns must be associated with an implicit or explicit demonstration that specifies their denotation; whereas the denotation of anaphoric and indexical pronouns is fully specified by the context as defined here.

4.2 Examples

Let us come to some to some illustrations of the analysis. In the meta-language each proper name is abbreviated with its initial (j for John, m for Mary, etc). Furthermore, in each of the examples to be discussed, we assume that:

(i) John is talking to Mary in world w. (We assume that neither John nor Mary is the President.)

(ii) no restrictor is empty, and some most salient element satisfying the relevant conditions can be found.

We write *pronoun*$_{\pm i}$ for *the* =±*i* (i.e. the most salient individual identical to ±i)

We write *Peter* for *the Peter* (i.e. the most salient individual identical to Peter).

Extra-Linguistic Context

The first three examples are 'dry runs', so to speak. They do not involve any violations, but show how the system works for intransitive and transitive verbs, proper names and indexical pronouns. We provide in a. the sentence to be analyzed, in a'. its simplified Logical Form, and in b. its semantic analysis (we sometimes include both an abbreviated and a non-abbreviated Logical Form, in a'. and a". respectively).

(53) a. Peter is sick
a'. Peter be-sick

b. [[(a')]] wˆjˆm=[[be-sick]] wˆjˆmˆp
=1 iff p∈I_w(be-sick)

(54) a. Peter criticizes Ann
a'. [Peter [criticizes Ann]]
b. [[(a')]] wˆjˆm=[[criticize Ann]] wˆjˆmˆp=[[criticize]] wˆjˆmˆpˆa
=1 iff pˆa∈I_w(criticize)

(55) a. I am sick
a'. pro$_{-2}$ be-sick, *which abbreviates:*
a". the =-2 be-sick
b. [[(a")]] wˆjˆm=[[be-sick]] wˆjˆmˆj
=1 iff j∈I_w(be-sick)

More interesting, (56) illustrates the role that *Minimize Restrictors!* can play to rule out a simple example. The non-minimal description *the John* is deviant because it is less economical than *the =-2*, where we replaced the predicate *John* with a combination of = and the negative index *-2* (remember that according to (52) negative indices are 'free', and can be added to a description to compensate the elimination of a restrictor!)

(56) a. #John is sick
a'. the John be-sick
b. [[(a')]] wˆjˆm=[[be-sick]] wˆjˆmˆj
But the same sequence could have been obtained by replacing *the John* with *pro$_{-2}$*, i.e. *the=-2,* hence by *Minimize Restrictors!* the sentence is deviant.

The next three examples display explicit definite descriptions. The first one is felicitous, the second is ruled out by *Minimize Restrictors!*, and the third is ruled in because a modifier that is referentially irrelevant has an expressive component.

(57) a. the President is sick
a'. the President be-sick
b. [[(a')]] wˆjˆm=[[be-sick]] wˆjˆmˆr
=1 iff r∈I_w(be-sick)
with r=the most salient d in wˆjˆm satisfying [[President]] wˆjˆmˆd, i.e. r=the most salient d satisfying d∈I_w(President)

(58) a. #the tall President is sick
a'. the tall President be-sick
b. [[(a')]] wˆjˆm=[[be-sick]] wˆjˆmˆp
with p=the most salient d in wˆjˆmˆp satisfying d∈I_w(President) and d∈I_w(tall)
But there is a unique President, hence *tall* is redundant, and by *Minimize Restrictors!* the description is deviant.

(59) a. the stupid President is sick
a'. the stupid President be-sick
b. Same as in (58)b, except that *stupid* plays a pragmatic role, which is to convey the speaker's attitude towards the President.

We will now study some examples in which an entity - a car - is 'super-salient'. Being super-salient, the car in question appears in the initial context (as c), which has the

effect of disallowing the description *the car*, which is overly explicit since a description *the =-1* can be used to denote the very same object.

(60) a. It drives well [talking about a super-salient car]
a'. pro$_{-1}$ drive-well [evaluated in a sequence wˆjˆmˆc, with c being the super-salient car]
b. [[(a')]] wˆjˆmˆc=[[drive-well]] wˆjˆmˆcˆc
=1 iff c$\in$I$_w$(drive-well)

(61) a. #The car drives well [talking about a super-salient car]
a'. the car drive-well [evaluated in a sequence wˆjˆmˆc, with c being the super-salient car]
b. [[(a')]] wˆjˆmˆc=[[drive-well]] wˆjˆmˆcˆc
But the same denotation c could have been achived by using *pro$_{-1}$*, hence by *Minimize Restrictors!* the sentence is deviant.

At this point *Minimize Restrictors!* makes an interesting prediction. Consider the description *the stupid car* in the context we just described. *car* could not be eliminated or replaced with a combination of = and a negative index without making the sentence ungrammatical: *the stupid* appears to be simply ill-formed. *stupid* could be eliminated without making the sentence ungrammatical, but this would change its pragmatic import, which is to express the speaker's negative attitude towards the car. Thus this description is correctly predicted to be *acceptable*, as outlined in (62).

(62) a. The stupid car won't budge [about a super-salient car]
a'. the stupid car won't-budge [where for simplicity *won't budge* is unanalyzed]
b. [[(a')]] wˆjˆmˆc=[[drive-well]] wˆjˆmˆcˆc
The same denotation c could have been achived by using *pro$_{-1}$*, but the pragmatic effect would have been different, hence *Minimize Restrictors!* does not make this sentence deviant.
Hence [[(a')]] wˆjˆmˆc$\neq$# and [[(a')]] wˆjˆmˆc=1 iff c$\in$I$_w$(won't-budge)

Intra-linguistic Context

Let us now consider examples that have a bit more syntactic structure, and in which the notion of the 'intra-linguistic context', i.e. the context as it is created by the interpretation of the syntactic structure, plays an interesting role. We do not distinguish in this discussion between reflexive and non-reflexive pronouns, since we do not seek to account for Conditions A and B. (63) gives a grammatical example in which a pronoun is bound by an R-expression, and (64) illustrates the simplest case of a Condition C effect which is correctly ruled out by *Minimize Restrictors!*.

(63) a. Peter likes himself
a'. Peter like pro$_{-1}$
a". Peter like the =1

b. [[(a")]] wˆjˆm= [[like Peter]] wˆjˆmˆp=[[like]] wˆjˆmˆpˆp
=1 iff pˆp$\in$I$_w$(like)

(64) a. ??Peter likes Peter
a'. Peter like Peter
a". the Peter like the Peter
b. [[(a')]] wˆjˆm= [[like Peter]] wˆjˆmˆp=[[like]] wˆjˆmˆpˆp
But the same denotation could have been achieved with the pronoun *him$_{-1}$(self),* i.e. with *the =-1,* which is obtained from *the Peter* by (i) deleting *Peter* and (ii) adding a combination of a negative index and =. By *Minimize Restrictors!,* the sentence is deviant.

As we observed earlier, the sequence of evaluation turns out to represent the c-command relations that are found in the syntax (even though the *rules* by which the sequence of evaluation is constructed do not refer to c-command). This is essential to explain why (65)a is acceptable. We analyze *Peter's friend* as *the Peter friend,* where *friend* is a transitive predicate. Since *Peter* is itself short for *the Peter,* the full expression comes out as *the [the Peter] friend*, as shown in a". The abbreviated Logical Form given in a'. is somewhat more legible:

(65) a. Peter's friend likes Peter
a'. [the [Peter friend]] like Peter
a". [the [[the Peter] friend]] like [the Peter]
b. [[(a")]] wˆjˆm=[[like Peter]] wˆjˆmˆf=[[like]] wˆjˆmˆfˆp
=1 iff fˆp$\in I_w$(like)
with f=[[the Peter friend]] wˆjˆm=the most salient d satisfying [[Peter friend]] wˆjˆmˆd=1, i.e. the most salient d satisfying [[friend]] wˆjˆmˆdˆp=1, i.e. dˆp$\in I_w$(friend)

Why is this sentence not ruled out by *Minimize Restrictors!* ? Well, either occurrence of *Peter* could certainly be replaced *salva denotatione* with a demonstrative pronoun *he$_1$*, on the assumption that the demonstrative function D assigns Peter to the index 1. But *Minimize Restrictors!* only allows for the introduction of *negative* indices in Logical Forms, not of *positive* ones (as mentioned earlier, this distinction is intuitively motivated by the fact that positive indices have more semantic content that negative ones because unlike the latter they require an implicit or explicit demonstration). On the other hand replacing either occurrence of *Peter* with an anaphoric pronoun *he$_{-i}$* would not yield the desired denotation no matter what the value of i is. The first occurrence of *Peter* is evaluated under a sequence wˆjˆmˆd for various individuals d. No value for i would make *he$_{-i}$* refer to Peter. And the same point applies to the second occurrence of *Peter,* which is evaluated with respect to the sequence wˆjˆmˆf, where f is Peter's friend: no value of i would allow *he$_{-i}$* to refer to Peter, as is desired. Therefore *Minimize Restrictors!* does not rule out the above sentence. Exactly the same reasoning could be applied to *His$_1$ friend likes Peter*, where D(1)=Peter: neither *he$_1$* nor *Peter* can be replaced with a pronoun *he$_{-i}$ salva denotatione.*

The preceding examples involved a single clause. But *Minimize Restrictors!* can equally well derive Condition C effects that arise in bi-clausal examples. We just need to make use of the rule we posited in (51)c to handle embedded clauses:

(66) a. ??Peter forced me to hire Peter
a'. Peter Tom forced to hire Peter
b. [[(a')]] wˆjˆm=[[Tom forced to hire Peter]] wˆjˆmˆp

=[[forced to hire Peter]] w^j^m^p^t
=[[forced]] w^j^m^p^t^π
with π=λw' [[hire Peter]] w'^j^m^p^t=λw' [[hire]] w'^j^m^p^t^p
The same denotation could be obtained by replacing the last occurrence of *Peter* with *him*$_{-1}$, and since *Peter* does not serve any other pragmatic purpose, the sentence is ruled out by *Minimize Restrictors!*

When we consider longer examples, however, the Condition C violation can be made to disappear if the proper name can serve a function of disambiguation that a mere pronoun couldn't fulfill.

(67) a. **A linguist [working on Binding Theory]** was so devoid of any moral sense that **he** forced a physicist [working on particles] to hire **the linguist**'s girlfriend in his lab.
b. ??**A linguist working on Binding Theory** was so devoid of any moral sense that **he** forced me to hire **the linguist**'s girlfriend in his lab.

Giving a complete derivation of the truth-conditions of these examples would take too much space, so we will consider in (68) an example whose empirical status is much less clear, but which is considerably easier to handle on a formal level:

(68) a. Peter forced Tom to hire Peter
a'. Peter Tom forced to hire Peter
b. [[(a')]] w^j^m=[[Tom forced to hire Peter]] w^j^m^p
=[[forced to hire Peter]] w^j^m^p^t
=[[forced]] w^j^m^p^t^π
with π=λw' [[hire Peter]] w'^j^m^p^t=λw' [[hire]] w'^j^m^p^t^p
The same denotation could be obtained by replacing the last occurrence of *Peter* with *him*$_{-1}$**.** However the proper name serves a disambiguating function with respect to the sequence w'^j^m^p^t, and hence it is acceptable.

Of course it is worth asking why (68)a is not in fact as acceptable as the long sentence in (66)a. The reason is probably that, due to Conditions A and B, a pronoun would in fact disambiguate the sentence: coreference with *Tom* would require the sentence to come out as *Peter forced Tom to hire himself,* leaving Peter as the only plausible referent for *him* in *Peter forced Tom to hire him*. In effect, then, this example might be rather similar to the one in (67)b, where the presence of *me* as an intervener makes the Condition C effect reappear because *the linguist's girlfriend* could be replaced with *his girlfriend* without making the sentence any more ambiguous.

5 Extension to Discourse

In this section we will sketch a possible extension of the analysis to cases of backwards anaphora in discourse. In a nutshell, the argument is as follows:

-According to our earlier discussions, the sequence of evaluation includes all elements that are salient at some point in the semantic analysis of a sentence, either because they were 'super-salient' in the discourse situation, or because they were processed at some earlier point in the analysis of the sentence.

-In general, each new sentence may access a 'fresh' sequence of evaluation, which only includes the speaker and addressee (and thus does not include elements that were processed in the preceding sentences in the discourse).

-However, when two sentences are 'narratively parallel', in a sense to be clarified in future research, the sequence cannot be re-set and must be inherited from the preceding sentence.

-Combined with *Minimize Restrictors!,* this hypothesis derives some constraints on coreference in discourse.

5.1 Generalization and Examples

Basic Examples

Bolinger 1977, 1979 notes that the precise narrative content of a sentence can affect the possibilities it displays for backwards anaphora. Some examples can be found at the discourse level as well. The following contrasts are reminiscent of Condition C, but do not involve any notion of c-command:

(69) a. #He entered. John sat down.
b. He entered. John looked pale.
a'. (?)He entered. The idiot sat down.
b'. He entered. The idiot looked pale.

The surprising contrast is that between a. and b. There doesn't seem to be any structural difference between the two examples, and yet coreference is acceptable in b. but not in a. The analogy with Condition C is brought out by the fact that an expressive in the second sentence makes the backwards anaphora somewhat more acceptable even where it is disallowed with a proper name, as shown in a'.

But why should there be a contrast between (69)a and (69)b? One could try several potential explanations having to do with the aspectual class of the Verb Phrases at hand. But this cannot be the crucial factor, as suggested by the contrast in (70), where all the VPs involved are stative and individual-level:

(70) a. #He had brown hair. John had blue eyes.
b. He had brown hair. John was very handsome.

I would like to suggest that the difference between the 'good' and the 'bad' cases is that in the latter the two sentences are entirely parallel from a narrative point of view. In (70)a, which is deviant, two facts are stated that are on a par. In (70)b, by contrast, there is an implicit discourse relation between the two sentences: the second is naturally construed as a conclusion, one argument for which is presented in the first sentence. Similarly, in (69)b there is an asymmetry between the first sentence, which describes an event, and the second, which provides its background. No such asymmetry holds in (69)a, where each sentence describes an event on a par with the other.

Needless to say, the notion of 'narrative parallelism' will have to be investigated and clarified in future research. With considerable vagueness, our current generalization can be stated in the following way:

(71) *Tentative Generalization:* Backwards anaphora is allowed in discourse between S_1 and S_2, unless S_1 and S_2 are narratively parallel (roughly, uttered from exactly the same perspective).

Why should this generalization hold? Our hypothesis is that when two sentences are narratively parallel, the second must be evaluated with respect to the context of evaluation with respect to which the last word of the first sentence was evaluated. In other cases, the sequence of evaluation can be 're-set' at the beginning of the evaluation of each sentence, which accounts for the general availability of backwards anaphora in discourse. The hypothesis is summarized in (72).

(72) Hypothesis
(i) Normally, the context can be re-set from one sentence to the next.
(ii) However, when two sentences are narratively parallel, the second sentence is evaluated within the sentence-internal context that resulted from the first sentence.

The Role of Connectives

Before we illustrate more formally how our theory can handle these examples, it is worth pointing out that the theory of 'narrative parallelism', imprecise though it is, predicts that discourse connectives should generally have the effect of making backwards anaphora in discourse much easier because they establish discourse relations that 'break' any narrative parallelism there would be without them. This prediction appears to be borne out, though further empirical work will be required to confirm these facts:

(73) a. ??He entered. John sat down and started to read the newspaper.
b. He entered. And then, John sat down and started to read the newspaper.
c. He entered. But then John sat down and started to read the newspaper.

(74) a. #He had brown hair. John had blue eyes. (He was very handsome).
b. He had brown hair. In addition, John had blue eyes. He was very handsome.
c. He had brown hair. John even had blue eyes. He was very handsome.

Other factors

In addition, the factors that were seen to obviate Condition C effects in previous sections are also at work with respect to backwards anaphora in discourse. We already saw that expressive content can play a crucial role, as in ?*He entered. The idiot sat down.,* which to my ear is quite a bit better than *#He entered. John sat down.,* understood with coreference. Similarly, disambiguation seems to me to make (75)b somewhat more acceptable than (75)a.

(75) a. #He entered. Peter sat down.
b. He entered. Ann yelled. John sat down.

5.2 (Semi-)Formal Analysis

Using the formalism we developed in the preceding sections, a semi-formal account can be developed. I call the account '*semi*-formal' because it crucially hinges on a notion of narrative parallelism that is not made explicit, and is left for future research.

To start with an example in which two sentences are narratively parallel, consider (76).

(76) a. He entered. He sat down [talking about Peter]
a'. he_1 enter. He_{-1} sat-down. with D(1)=Peter.
b. Sentence 1: $[\![he_1\ enter]\!]^{w^\frown j^\frown m}=[\![enter]\!]^{w^\frown j^\frown m^\frown p}=1$ iff $p \in I_w$(enter)
Sentence 2: no possible change of point of view, hence Sentence 2 is evaluated with respect to the sequence obtained 'at the end' of the evaluation of Sentence 1.
$[\![he_{-1}\ sat\text{-}down]\!]^{w^\frown j^\frown m^\frown p}=[\![sat\text{-}down]\!]^{w^\frown j^\frown m^\frown p^\frown p}$
$=1$ iff $p \in I_w$(sat-down)

The discourse is entirely acceptable with coreference because the second sentence involves a pronoun, not an R-expression. In the analysis in (76) we have assumed that the two sentences are narratively parallel, and thus that the second sentence is evaluated with respect to the sequence with respect to which the last word of the preceding sentence was evaluated. In this case it is crucial that the second pronoun be anaphoric, i.e. that it bear a negative index, since otherwise *Minimize Restrictors!* would rule it out. This effect is seen in (77), which is correctly analyzed as being deviant.

(77) a. #He entered. Peter sat down.
a'. he_1 enter. Peter sat-down. with D(1)=Peter.
b. Sentence 1: $[\![he_1\ enter]\!]^{w^\frown j^\frown m}=[\![enter]\!]^{w^\frown j^\frown m^\frown p}=1$ iff $p \in I_w$(enter)
Sentence 2: no possible change of point of view, hence Sentence 2 is evaluated with respect to the sequence obtained 'at the end' of the evaluation of Sentence 1.
$[\![Peter\ sat\text{-}down]\!]^{w^\frown j^\frown m^\frown p}=[\![sat\text{-}down]\!]^{w^\frown j^\frown m^\frown p^\frown p}$
But in the context $w^\frown j^\frown m^\frown p$ the same denotation (=p) could have been achieved by using the pronoun he_{-1}, hence by *Minimize Restrictors!* the sentence is deviant.

If we had not assumed that the two sentences were narratively parallel, the sequence would have been predicted to be grammatical. This is seen in (78), which is structurally analogous to (78), but whose interpretation proceeds differently because the sequence of evaluation can be 're-set' at the beginning of the second sentence. As a result, *Minimize Restrictors!* does not rule out the second sentence any more.

(78) a. He entered. Peter was pale [talking about Peter]
a'. he_1 enter. Peter be-pale. with D(1)=Peter.
b. Sentence 1: $[\![he_1\ enter]\!]^{w^\frown j^\frown m}=[\![enter]\!]^{w^\frown j^\frown m^\frown p}$
$=1$ iff $p \in I_w$(enter)
Sentence 2: the point of view is a different one, hence Sentence 2 need not be evaluated with respect to the sequence obtained 'at the end' of the evaluation of Sentence 1.
$[\![Peter\ be\text{-}pale]\!]^{w^\frown j^\frown m}=[\![be\text{-}pale]\!]^{w^\frown j^\frown m^\frown p}$
$=1$ iff $p \in I_w$(be-pale)

Finally, we should mention two cases in which (a) several sentences are narratively parallel, and yet (b) backwards anaphora is in fact acceptable because a description plays a special pragmatic role. This is the case in (79), where *the idiot* has an expressive component that makes it acceptable.

(79) a. Peter entered. The idiot sat down.
a'. Peter enter. The idiot sat-down.
b. Sentence 1: [[Peter enter]] w^j^m=[[enter]] $w^j^m^p$ =1 iff $p \in I_w$(enter)
Sentence 2: no possible change of point of view, hence Sentence 2 is evaluated with respect to the sequence obtained 'at the end' of the evaluation of Sentence 1.
[[The idiot sat-down]] $w^j^m^p$=[[sat-down]] $w^j^m^p^p$, on the assumption that p is the most salient idiot of $w^j^m^p^p$.
Although p is already in the context $w^j^m^p$ and hence could have been referred to using *he$_{-1}$, the idiot* contributes a different pragmatic effect, as it expresses the speaker's attitude towards p, and hence the sentence is acceptable.

Similarly, in (80) *Peter* plays a role of disambiguation that a pronoun couldn't fulfill, and thus despite *Minimize Restrictors!* the sentence ends up being acceptable.

(80) a. He entered. Albert yelled. Peter collapsed. [where *he* refers to Peter]
a'. he$_1$ enter. Albert yell. Peter collapse.
b. Sentence 1: [[he$_1$ enter]] w^j^m=[[enter]] $w^j^m^p$=1 iff $p \in I_w$(enter)
Sentence 2: no possible change of point of view, hence Sentence 2 is evaluated with respect to the sequence obtained 'at the end' of the evaluation of Sentence 1.
[[Albert yell]] $w^j^m^p$=[[yell]] $w^j^m^p^a$=1 iff $a \in I_w$(yell)
Sentence 3: no possible change of point of view, hence Sentence 3 is evaluated with respect to the sequence obtained 'at the end' of the evaluation of Sentence 2.
[[Peter collapse]] $w^j^m^p^a$=[[collapse]] $w^j^m^p^a^p$
If a were not in the sequence, a violation of *Minimize Restrictors!* would be incurred. But thanks to the presence of a, the proper name (i.e. description) *Peter* serves a disambiguating function, and hence the sentence is acceptable.

6 Concluding remarks

We have tried to suggest that a pragmatic principle, *Minimize Restrictors!*, might account for Condition C and -more tentatively- for some constraints on backwards anaphora in discourse. There are many loose ends, however. I only list a few:

1. The analysis would have to be extended to handle quantified examples, which are entirely absent from our discussion.

2. It remains to be seen whether *Minimize Restrictors!* or related principles could be applied to other binding-theoretic phenomena such as Condition B and Crossover effects (one advantage of the theory of Schlenker 2005a, which was more coarse-grained with respect ton Condition C, was that it offered a unified framework for several binding-theoretic effects; this is not the case in the present analysis).

3. Complex demonstratives (e.g. *that man*) can be anaphoric and may be c-commanded by a coreferential expression in violation of Condition C. An account should follow from the kind of analysis envisaged here, but the details are currently unclear.

4. There is recent processing work on definite descriptions that should be connected to the present analysis (see for instance Grodner & Sedivy 2005).

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