

Principle C¹

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Abstract

A widely made observation is that there is something that disfavors repeating names, and name-like terms, when they are intended to corefer. This paper investigates the sentence internal version of this penalty. I begin by relating it to a more general condition in Tom Wasow's MIT dissertation that disallows an anaphor from having more information in it than that anaphor's antecedent. I attempt to sketch how that condition can be viewed as a consequence of how the presuppositions of definite descriptions are accommodated. I then argue that Principle C is a related version of this process, but one that holds of function application rather than anaphora strictly speaking. This is an idea of Ed Keenan's, which I modify so that it is related to the repeated name condition.

1 Introduction

Chomsky (1981) formulates a constraint on the referential relationships among what he calls "referring expressions." As a simplifying, though I believe equivalently good, way of formulating that condition, I will frame it in terms of definite descriptions. Here is a simple version of that condition, which he dubs "Principle C."

(1) Principle C

A non-pronominal definite description must be disjoint in reference from a DP that c-commands it.

Principle C is designed to capture the contrasts between (2) and (3). (Understand underlined DPs to corefer, i.e. not be disjoint in reference. And understand coindexation to indicate that one DP is a variable bound to the other.)

- (2) a. The woman's father met someone who admires the woman.
b. No woman₁'s father met anyone who'd vote for the woman₁.
- (3) a. *The woman met someone who admires the woman.
b. *No woman₁ met anyone who'd vote for the woman₁.

I would like to try to take some steps towards understanding why Principle C exists. My hope is to explain some of its particularities along the way.

Often Principle C effects are illustrated by somewhat simpler examples than the ones I've provided in (3). My examples involve putting the definite description that triggers a Principle C effect (what I'll call "the trigger" from now on) in a relative clause. Other examples said to illustrate Principle C effects put the trigger into a complement clause, as in (4).

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- (4) a. * The woman said that someone admires the woman.
 b. * No woman₁ said that anyone admires the woman₁.

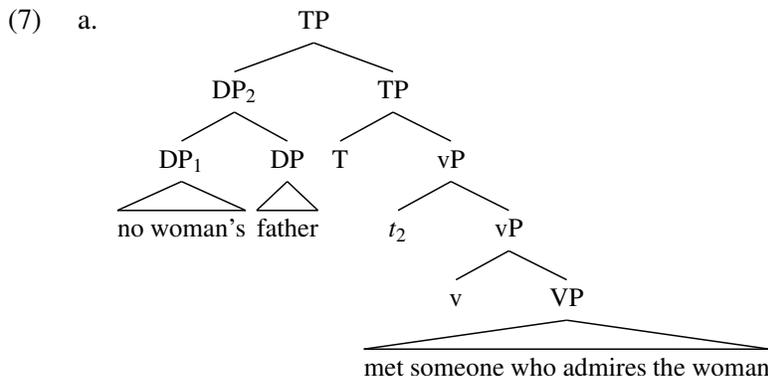
I will not consider these environments because they trigger disjoint reference effects that seem to be independent of Principle C. That can be seen by considering what happens with epithets, which trigger a disjoint reference effect in contexts like (4), see (5), but don't trigger Principle C effects, as the comparison between (3) and (6) indicates.

- (5) a. * The woman said that someone admires the idiot.
 b. * No woman₁ said that anyone admires the idiot₁.
 (6) a. The woman met someone who admires the idiot.
 b. No woman₁ met anyone who'd vote for the idiot₁.

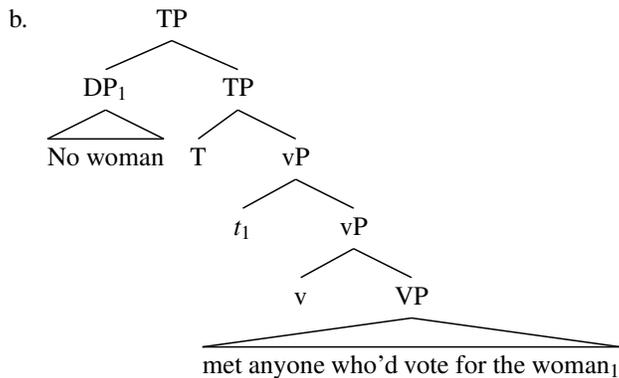
Dubinsky and Hamilton (1998) argues that epithets are subject to a disjoint reference effect that targets logophoric contexts. Epithets cannot corefer with arguments that would be the logophoric center for a logophoric anaphor in that position. Complement clauses are generally related to a logophoric center, while relative clauses aren't. This, they argue, is what explains the contrast between (5) and (6). If other definite descriptions are also subject to the kind of disjoint reference effect that epithets are, then the disjoint reference effect in (4) could have that as its cause. I'll remove this possible confound and use relative clauses throughout when seeking Principle C effects.²

This introduces one of the peculiarities of Principle C that we should try to explain. Why do the definite descriptions it applies to not include epithets? If we treat pronouns as definite descriptions – and this seems reasonable given their meanings – then we have two kinds of definite descriptions that aren't Principle C triggers: epithets and pronouns. One of my goals will be to explain this.

A second goal should be to explain why c-command seems relevant. There is a glitch with the c-command condition that should be understood. We can see that glitch by looking carefully at the syntax for (2b) and (3b). The surface syntax for these two sentences is as indicated in (7).



² I'm taking the gamble, then, that relative clauses represent the whole gamut of contexts in which anti-logophoric effects are not at play. A more complete paper would see if that is correct, and consider adjunct clauses, as well as other kinds of complement clauses, that embed the trigger.



The DP *no woman* c-commands *the woman* in (7b), and for this reason Principle C is violated. But in (7a), *no woman* doesn't c-command *the woman*, and for this reason Principle C is satisfied. However, in many circumstances, for a term to be interpreted as a variable bound by another it must be c-commanded by that binder. This isn't always the case, of course, as there are several ways for something to be construed as a variable. Definite descriptions in particular are capable of being so construed even when c-command doesn't hold. One kind of example is in (8)

- (8) In old timey movies, everyone who is introduced to a woman kisses the woman's hand.

In the most salient interpretation of this sentence, *the woman* is a variable whose value is determined by the value *a woman* gets. It's clear that *a woman* doesn't c-command *the woman*, and in fact because *a woman* falls within the scope of *everyone*, it also cannot have *the woman* in its semantic scope. We should determine whether or not this is the way that *the woman* gets its variable interpretation in (7a), because otherwise we would have grounds for thinking that *the woman* in this example actually is c-commanded by the quantifier it varies with.

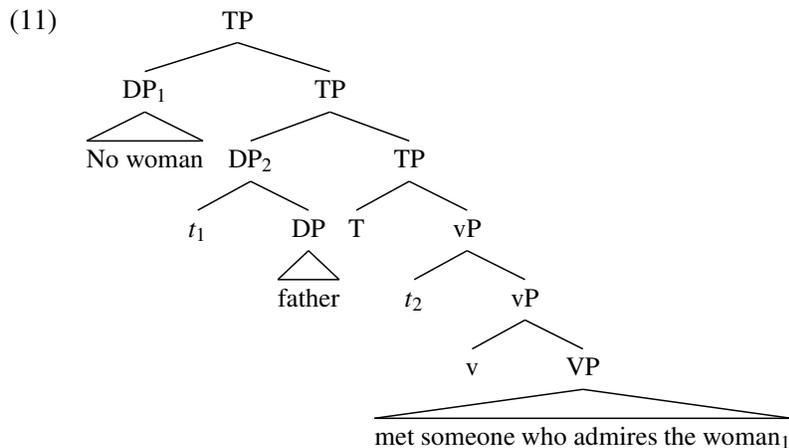
I think it is unlikely that the bound variable interpretation of *the woman* in (7a) comes about in the same way that it does in (8). One of the features of the process involved in giving the bound variable interpretation in (8) is that it (often) becomes unavailable when negative quantifiers are involved. In (9), for instance, the variable interpretation for *the woman* is not available.

- (9) In old timey movies, everyone who is introduced to no woman kisses the woman's hand.

And yet, the quantifier in (7a) is negative and still successfully binds *the woman*. Note also that the scope of *no woman* in (7a) is outside of the definite description it is part of. The interpretation this sentence gets is parallel to that of (10a) and not (10b).

- (10) a. There is no woman, *x*, is such that *x*'s father met someone who admires *x*.
 b. The father that no woman, *x*, has met someone who admires *x*.

For these reasons, I suggest that Quantifier Raising puts the quantifier in (7a) into a position where it does c-command *the woman*. From (7a) is derived (11).



But, of course, if this is the solution to the problem of understanding how *the woman* in this sentence is bound by *no woman*, it also predicts that this example should violate Principle C. The suggestion that Chomsky had for this kind of problem was to rely on a way of segregating syntactic positions that DPs occupy into two classes. What makes those classes of positions different is whether the general principles of anaphora see them or not. Those that are seen, he called “Argument positions” (A-positions), and the rest he called “ \bar{A} positions.” Principle C, along with those principles that govern which things various pronominals can be anaphoric to, only see DPs in A-positions. This is also something that I will strive to derive.

A final property of Principle C that is less frequently discussed is that its strength seems dependent on the particular definite descriptions that are involved.³ This can be seen by considering the examples in (12).

- (12)
- a. The woman met someone who admires her.
 - b. ?? The woman met someone who admires the woman.
 - c. ?? Jane met someone who admires the woman.
 - d. ?? The best student met someone who admires the student.
 - e. ?? The widow met someone who admires the woman.
 - f. ?? The tall woman met someone who admires the woman.
 - g. * The woman met someone who admires Jane.
 - h. * The student met someone who admires the best student.
 - i. * The woman met someone who admires the widow.
 - j. * The woman met someone who admires the tall woman.

This same cline shows up even when c-command doesn’t hold between one DP and the other:

- (13)
- a. The woman’s father met someone who admires her.
 - b. ? The woman’s father met someone who admires the woman.
 - c. ? Jane’s father met someone who admires the woman.
 - d. ? The best student’s teacher met someone who admires the student.

³ An exception is Lasnik (1989).

- e. ? The widow's father met someone who admires the woman.
- f. ? The tall woman's father met someone who admires the woman.
- g. * The woman's father met someone who admires Jane.
- h. * The student's teacher met someone who admires the best student.
- i. * The woman's father met someone who admires the widow.
- j. * The woman's father met someone who admires the tall woman.

Principle C, then, describes the fact that whatever is responsible for the disjoint reference effects in (13) is magnified in situations where c-command from an A-position is involved.

2 The Repeated Name Condition

I'll begin by trying to account for the difference in grammaticality that the last four examples in (12) and (13) have with the other examples in (12) and (13). This effect is sometimes called the "repeated name condition," and it can be found across sentences as well.

- (14) a. * The student's teacher was talking about her classes the other day. She told me that the young student is interested in linguistics.
- b. The young student's teacher was talking about her classes the other day. She told me that the student is interested in linguistics.

I will assume that the repeated name condition is a function of how discourses are organized. Unlike Principle C, it does not seem to be a property of sentence grammar.

A simple observation is that the definite descriptions that invoke the strongest violation of the repeated name condition are more informative than the DPs they cannot corefer with. For instance, in *the woman's father met someone who admires the widow*, *the widow* provides more information about its referent than does *the woman*. The information about the referent that *the woman* provides is just that it is an adult female, whereas *the widow* says that its referent is an adult female that has also lost a spouse by death.

Wasow (1972) studied this phenomenon, and he proposed The Novelty Constraint for it.

(15) Novelty Constraint

An anaphor may not introduce any presuppositions not associated with its antecedent.

(Wasow 1972, (25): 178)

The presuppositions of definite descriptions are given by the NP within them; *the woman*, for example, presupposes that there is a unique x in the common ground that is a woman. Wasow's Novelty Constraint allows *the woman* to be anaphoric on either *the widow* and *the woman* because its presupposition (that there is a unique woman) is already associated with its antecedent. By contrast, *the widow* cannot be anaphoric to *the woman*, because *the widow* invokes a presupposition concerning the death of a spouse that is not associated with *the woman*. Similar observations hold for each of the other pairs of DPs in (12) and (13). I will take the Novelty Constraint to be essentially correct, and seek an explanation for it. Why shouldn't a definite description used anaphorically be able to introduce new information about its referent?

An interesting thing about the NP associated with a definite description is that it can also be used to introduce a referent into the discussion. In (16), for instance, the subjects can introduce the individuals they describe into the conversation; these sentences can be the first in a discourse.

- (16) a. My daughter studies neuroscience.
 b. The college student in my family studies neuroscience.

Lewis (1979) described these as cases in which the presupposition of the definite descriptions are “accommodated.” In Stalnaker (2002)’s model, accommodation can be modeled as using the existential quantification within the presupposition to introduce an entity into the common ground. Not all definite descriptions invoke presuppositions that are equally capable of being accommodated, however. A factor in making them capable of being accommodated is how much information they contain. The sentence in (17), for instance, feels much more dependent on a common ground that satisfies the presupposition of its subject than does the subject of (16a).

- (17) The woman studied neuroscience.

This sentence cannot be the first in a discourse. Its presupposition requires that the common ground have been provided with a unique adult female, perhaps by the prior utterance of a sentence that explicitly introduces that woman (e.g.: *A woman enrolled in my class today*). I suggest that the sensitivity that accommodation has to informativity plays a role in the Novelty Constraint.

I’ll give a toy model of when the presupposition of a definite description can be accommodated. Let’s call the predicate that a definite description’s presupposition is derived from that DP’s “kernel.” In all of the cases we will examine, this predicate is the denotation of the NP that the definite description is built upon.

- (18) The kernel (K) of “the NP” is $\lambda x \llbracket \text{NP} \rrbracket (x)=1$,

The presupposition of a definite description is the existential closure of its kernel, along with the uniqueness information. For *the widow*, the presupposition is $\exists!x \text{widow}(x)$, and the presupposition for *the tall woman* is $\exists!x \text{tall}(x) \wedge \text{female}(x) \wedge \text{adult}(x)$.⁴ In the “normal” case, the presupposition of a definite description requires that it be uttered with a common ground that provides a unique entity that the definite description’s kernel holds of. I’ll say in this case that the kernel lives on the common ground (CG).

- (19) K lives on CG iff CG entails $\exists!x K(x) = 1$

To say that the kernel of a definite description lives on a common ground is just to say that kernel invokes a presupposition. A presupposition is accommodated when the kernel is used to introduce an entity into the common ground.

- (20) K is accommodated by CG iff it updates CG to CG' by adding $\exists!x K(x)$ to CG. For K to be accommodated by CG, the speaker and hearer must tacitly agree that K is sufficient to identify a unique x in CG such that $K(x) = 1$.

Finally, to insure that a kernel has an effect on the sentence it lives within:

- (21) A kernel must either be accommodated by a common ground or live on a common ground.

Let me rehearse how this is meant to work. Consider first (22).

- (22) The shortest linguistics professor at the University of Massachusetts is very strong.

⁴ $\exists!x$ means “there exists exactly one x .”

The kernel for the subject is:

$$(23) \quad K = \lambda x [\text{shortest_linguistics-professor_at-UMass}(x)=1]$$

If this is the first sentence of a discourse, the common ground will not entail that there is a unique individual that satisfies the kernel in (23). But (23) has enough information to locate an individual that meets its description so it can be accommodated by the common ground, as long as that common ground: (a) is compatible with there being linguistics professors at the University of Massachusetts, and (b) disallows there being two or more linguistics professors at the University of Massachusetts who are the shortest. Default background assumptions about the distribution of heights of a small number of individuals is indeed that their heights will not be identical, and so in this case the kernel is accommodated by the common ground.

Consider next (24).

$$(24) \quad \text{The short linguistics professor at the University of Massachusetts is very strong.} \\ K = \lambda x [\text{short_linguistics-professor_at-UMass}(x)=1]$$

The kernel of the subject in this example ($=K$) also cannot live on the common ground. But like (23), it is capable of identifying a unique individual that meets its description: if (a) the University of Massachusetts houses linguistics professors, and (b) the heights of the linguistics professors at the University of Massachusetts have an outlier at the short end of the scale. Unless this distribution of heights is part of the common ground before this sentence is uttered, accommodation here will not be perfect. The imperfection of (24), then, derives from the kernel of its subject being (slightly) insufficient to the task of identifying a unique referent under normal, default, assumptions. The hearer of (24) infers that the speaker's understanding of the common ground included information about the distribution of heights that makes the K in (24) sufficient to identify a unique referent.

A similar, but slightly more dramatic, effect is found in (25).

$$(25) \quad \text{The linguistics professor at the University of Massachusetts is very strong.} \\ K = \lambda x [\text{linguistics-professor_at-UMass}(x)=1]$$

The kernel in (25) lives on a common ground only if there is just one, unique, linguistics professor at the University of Massachusetts. That is also required of the common ground before (25) is uttered if it is to accommodate K , since only in that case will K be capable of locating a unique individual. (25) is predicted to be anomalous in all but the strange common grounds in which the University of Massachusetts has just one linguistics professor. Background assumptions are at odds with that common ground: if a university has one linguistics professor then it is probable that it has more. This is the source of (25)'s oddness. The kernel of its subject can neither live on the common ground nor be accommodated by it. Exactly the same reasoning accounts for the even worse (26).

$$(26) \quad \text{The professor at the University of Massachusetts is very strong.} \\ K = \lambda x [\text{professor_at-UMass}(x)=1]$$

This sentence requires a prior common ground in which the University of Massachusetts is lethally understaffed.

Finally, consider (27).

$$(27) \quad \text{She is very strong.} \\ K = \lambda x [\text{female}(x)=1]$$

The kernel in (27) requires that the common ground supply a unique individual that is female. Unless the context supplies a unique individual that is female, (27) cannot be the first sentence in a discourse.⁵ It will have to be preceded by something that changes the common ground appropriately; for instance, (27) could follow the sentence *Do you know Kristine Yu?*, thereby introducing a unique individual female into the common ground. That is required if the kernel of *she* is to live on the common ground, because only in that case will $\exists!x \text{ female}(x)$ be entailed. But it is equally required if the kernel of *she* is accommodated by the common ground. For only if the common ground has just a unique female in it will the K in (27) be sufficient to identify a unique individual.

My hypothesis is that it is not accidental that the sensitivity to the informativity of a definite description influences both the accommodation of a definite description's presupposition and whether it is construed as disjoint in reference with previous DPs. A theory about how presuppositions of definite descriptions are accommodated should, I suggest, connect with the repeated name condition. I will attempt to derive the repeated name condition and Wasow's Novelty Constraint from the conditions that determine whether a definite description's presupposition is accommodated. Indeed, I will try to strengthen Wasow's condition so that it not only prevents a term from being anaphoric to something with weaker presuppositions, it causes those terms to invoke the repeated name condition. To do that, I will strengthen the definition of accommodation to (28).

- (28) K is accommodated by CG iff it updates CG to CG' by adding that there is a unique x in CG' such that $K(x) = 1$. For K to accommodate CG, the speaker and hearer must tacitly agree that K is necessary and sufficient to identify a unique x in CG such that $K(x) = 1$.

This has the same consequence that the original definition of accommodation has. It requires a definite description's kernel to be sufficiently informative to uniquely identify an individual, given the common ground. The stronger condition in (28) is intended to cause the kernel of a definite description to be disjoint in reference with other DPs if the kernel of that definite description is more informative.

That the repeated name condition arises because the definite descriptions that violate it are more informative than necessary is not a new idea. It is the leading idea in Schlenker (2005), and there is considerable experimental evidence on behalf of such a constraint (e.g. Altmann and Steedman (1988), Crain and Steedman (1985), Tanenhaus, Spivey-Knowlton, Eberhard, and Sedivy (1995), Sedivy, Tanenhaus, Craig, and Carlson (1999), and Sedivy (2003)). The notion of "necessary" I have in mind is one that compares K to alternatives that are equally sufficient at identifying a unique x and determining whether K contains something irrelevant for this goal when compared to those alternatives. I am thinking of Grice's Maxim of Quantity. A fuller account than I can give here would spell this out. (See Marty (2018) for an idea.) Instead, I will rely on the simple observation that the cases at hand involve two definite descriptions whose kernels can be directly compared. If both of those kernels are sufficient for identifying a unique individual, but one does so with more descriptive content, then we can safely conclude that the more descriptive kernel does not meet the necessary-clause in (28).

⁵ A famous counter-example is from Partee (1973): a despondent-looking man utters "she left me." This example has only an idiomatic-like meaning; it reports that the man's female lover is no longer his lover. It cannot have a more transparently compositional meaning, and that, I speculate, is relevant to its ability to use the pronoun in a context that doesn't support its presupposition.

Let's see how (28) can produce the repeated name condition. Consider first the contrast in (29).

- (29) a. ? The widow's father met someone who admires the woman.
 b. * The woman's father met someone who admires the widow

The kernels of the two definite descriptions in (29a) are (30).

- (30) a. *the widow's father*
 $K = \lambda x \lambda y [\text{widow}(x)=1 \wedge \text{father_of_}x(y)=1]$
 $\text{CG} \ni \lambda w \forall x [\text{widow}(x) \rightarrow [\text{female}(x) \wedge \text{adult}(x)]] \text{ in } w$
- b. *the woman*
 $K = \lambda x [\text{female}(x)=1 \wedge \text{adult}(x)=1]$
 $\text{CG} \ni \lambda w \forall x [\text{widow}(x) \rightarrow [\text{female}(x) \wedge \text{adult}(x)]] \text{ in } w$

For each of these DPs, I also show the state of the common ground before they are uttered. A common ground is a set of worlds, and so we can characterize them with the propositions that describe those worlds. I will indicate the relevant worlds that make up a common ground with propositions that describe worlds that are elements of that common ground. Common grounds are sometimes changed by the utterance of the DPs. What is shown here is the state of the common ground before the utterance of the first definite description. The common ground at this point has no information in it beyond common background assumptions about the world that interlocutors bring to the conversation. One of those background assumptions that will be relevant concerns the meaning that *widow* has. Upon confronting the first definite description, there is no alternative but to accommodate its kernel. Doing so does not conflict with common background assumptions about the world, and so there is no perception of oddness that accompanies the accommodation. The result of speaking *the widow's father* thereby updates the common ground in the way indicated in (31).

- (31) a. *the widow's father*
 $K = \lambda x \lambda y [\text{widow}(x)=1 \wedge \text{father_of_}x(y)=1]$
 $\text{CG} \ni \lambda w \forall x [\text{widow}(x) \rightarrow [\text{female}(x) \wedge \text{adult}(x)]] \text{ in } w$
- b. *the woman*
 $K = \lambda x [\text{female}(x)=1 \wedge \text{adult}(x)=1]$
 $\text{CG}' \ni \lambda w \left\{ \begin{array}{l} \forall x [\text{widow}(x) \rightarrow [\text{female}(x) \wedge \text{adult}(x)]] \text{ in } w \wedge \\ \exists !x \exists !y \text{ widow}(x) \wedge \text{father_of_}x(y) \text{ in } w \end{array} \right.$

The kernel of *the woman* can live on CG' , if CG' entails $\exists !x \text{ woman}(x)=1$. It doesn't. That there is a unique widow in the situation being described does not ensure that there is a unique woman in that situation. As a consequence, *the woman* will have to be accommodated. If the individual that *the woman* refers to is the same as that referred to by *the widow*, then arguably its kernel, *woman*, is sufficient to identify that individual. There has been only one individual introduced into the common ground that makes $\lambda x \text{ woman}(x)$ true, and that is the widow. If *woman* is necessary to identify this individual, then it will pass the requirements of (28) and the common ground will be updated to (32).

$$(32) \quad CG' \ni \lambda w \begin{cases} \forall x [\text{widow}(x) \rightarrow [\text{female}(x) \wedge \text{adult}(x)]] \text{ in } w \wedge \\ \exists!x \exists!y \text{ widow}(x) \wedge \text{father_of_}x(y) \text{ in } w \wedge \\ \exists!x \text{ woman}(x) = 1 \text{ in } w \end{cases}$$

Is *woman* necessary to identify the relevant individual? It is if there is no alternative NP that is sufficient at identifying the widow in this context and has less information in it than *woman*. Candidate alternatives are *the female* and *she*. I believe use of *the female* invites the inference that the referent is not human, which disqualifies its use here.⁶ By contrast *she* is less informative – since it does not that the referent be an adult as does *woman* – and it should therefore be preferred. It is, and this may be why use of the *the woman* here is not perfect. Note that it improves if a non-restrictive, expressive, adjective is added such as *poor*, with its pitiable meaning.

(33) The widow's father knows someone who admires the poor woman.

To use *poor* requires a common noun such as *woman*, and this could make *her* no longer an alternative. Note that *poor*, in this example, does not make a contribution towards identifying the referent of the definite description. It is, for this reason, not part of the calculation of whether its meaning is necessary to identify a unique referent for a common ground.

Consider next (29b). The two definite descriptions in this sentence, and the state of the common ground before either have been uttered, is as in (34).

(34) a. *the woman's father*

$$K = \lambda x \lambda y [\text{female}(x)=1 \wedge \text{adult}(x)=1] \wedge \text{father_of_}x(y)=1 \\ CG \ni \lambda w \forall x [\text{widow}(x) \rightarrow [\text{female}(x) \wedge \text{adult}(x)]] \text{ in } w$$

b. *the widow*

$$K = \lambda x \text{ widow}(x)=1 \\ CG \ni \lambda w \forall x [\text{widow}(x) \rightarrow [\text{female}(x) \wedge \text{adult}(x)]] \text{ in } w$$

Upon utterance of *the woman's father*, there is no choice but to accommodate its kernel, and this updates the common ground as indicated in (35).

(35) a. *the woman's father*

$$K = \lambda x \lambda y [\text{female}(x)=1 \wedge \text{adult}(x)=1] \wedge \text{father_of_}x(y)=1 \\ CG \ni \lambda w \forall x [\text{widow}(x) \rightarrow [\text{female}(x) \wedge \text{adult}(x)]] \text{ in } w$$

b. *the widow*

$$K = \lambda x \text{ widow}(x)=1 \\ CG' \ni \lambda w \begin{cases} \forall x [\text{widow}(x) \rightarrow [\text{female}(x) \wedge \text{adult}(x)]] \text{ in } w \wedge \\ \exists!x \exists!y [\text{female}(x) \wedge \text{adult}(x)] \wedge \text{father_of_}x(y) \text{ in } w \end{cases}$$

Because CG' does not entail $\exists!x \text{ widow}(x)$, the kernel associated with *the widow* cannot live on CG' . If the kernel of *the widow* is accommodated, then CG' will become CG'' .

⁶ This follows from Heim (1991)'s maximize presupposition.

$$(36) \quad CG'' \ni \lambda w \begin{cases} \forall x [\text{widow}(x) \rightarrow [\text{female}(x) \wedge \text{adult}(x)]] \text{ in } w \wedge \\ \exists!x \exists!y [\text{female}(x) \wedge \text{adult}(x)] \wedge \text{father_of_}x(y) \text{ in } w \wedge \\ \exists!x \text{ widow}(x) \text{ in } w \end{cases}$$

If the individual that *the widow* refers to is the same that *the woman* refers to, then the requirement that the kernel of *the widow* be necessary for the purposes of identifying its referent is violated. Clearly, the speaker deemed *woman* sufficient for that purpose, and *widow* is stronger. On the other hand, if the individual that *the widow* refers to is different than the individual that *the woman* refers to, it will be at odds with CG'' 's entailments. CG'' entails that there is a unique woman and a unique widow, and that requires that they be the same. To get the disjoint reference effect, we need a method of making the referents of *the widow* and *the woman* be able to differ and yet remain consistent with the common ground that accommodates them.

One possibility involves letting definite descriptions come with referential indices. We've already seen in (11) that this is necessary to capture the fact that definite descriptions can be bound variables. When referential indices are not bound by a quantifier, they get their value by an assignment function, g , which assigns to that index a referent in the discourse model. The denotation and presupposition of a definite description with a referential index attached is (37).

$$(37) \quad \begin{array}{l} \text{a. } \llbracket \text{the NP}_1 \rrbracket = \iota x \llbracket \text{NP} \rrbracket(x) \wedge g(1) = x \\ \text{b. } K = \lambda x \llbracket \text{NP} \rrbracket(x)=1 \wedge g(1) = x \end{array}$$

The referential index adds to the meaning of the definite description that the individuals it refers to must be given by the assignment function. Assume that assignment functions are defined so that they do not assign to different indices the same referent.

$$(38) \quad n \neq m \rightarrow g(m) \neq g(n)$$

This gives us the ability to distinguish the referents of two definite descriptions by giving them different referential indices.

Reconsider now (29b) with the assumption that the two definite descriptions come with different referential indices. After the utterance of the first definite description, we'll have the situation described by (39).

$$(39) \quad \begin{array}{l} \text{a. } \textit{the woman}_2 \textit{'s father} \\ K = \lambda x \lambda y [\text{female}(x)=1 \wedge \text{adult}(x)=1 \wedge g(2) = x] \wedge \\ \quad \text{father_of_}x(y)=1 \\ CG \ni \lambda w \forall x [\text{widow}(x) \rightarrow [\text{female}(x) \wedge \text{adult}(x)]] \text{ in } w \\ \text{b. } \textit{the widow}_3 \\ K = \lambda x \text{ widow}(x)=1 \wedge g(3) = x \\ CG' \ni \lambda w \begin{cases} \forall x [\text{widow}(x) \rightarrow [\text{female}(x) \wedge \text{adult}(x)]] \text{ in } w \wedge \\ \exists!x \exists!y [\text{female}(x) \wedge \text{adult}(x) \wedge g(2) = x] \wedge \text{father_of_}x(y) \text{ in } w \end{cases} \end{array}$$

The presupposition introduced by *the widow* can be accommodated without creating an inconsistency:

$$(40) \quad CG'' \ni \lambda w \begin{cases} \forall x [\text{widow}(x) \rightarrow [\text{female}(x) \wedge \text{adult}(x)]] \text{ in } w \wedge \\ \exists!x \exists!y [\text{female}(x) \wedge \text{adult}(x) \wedge g(2) = x] \wedge \text{father_of_}x(y) \text{ in } w \wedge \\ \exists!x \text{ widow}(x) \wedge g(3) = x \text{ in } w \end{cases}$$

In this scenario, then, *the widow* and *the woman* must bear different referential indices, or the kernel introduced by *the widow* can neither live on its common ground nor be accommodated by it. This is the disjoint reference effect.

This carries over to all of the other cases in (12) and (13). It captures the same cases that Wasow's Novelty Constraint is designed for. It also works better for a case that Wasow's Novelty Constraint seems to fail on. That case arises when a pronoun is bound by a term whose presuppositions do not include those of the pronoun. One such case is (41).

(41) Every student₁ in my class thinks she₁ will get an A.

The kernel associated with *every student*₁ is (42a), and the presupposition associated with *she*₁ is (42b).

- (42) a. $\lambda x \text{ student_in-my_class}(x)=1 \wedge g(1) = x$
 b. $\lambda x \text{ female}(x)=1 \wedge g(1) = x$

When referential indices are involved in binding, the values are no longer given by the assignment function, but are given instead by the quantifier involved in the binding. This has the effect of causing the kernel of the variable to live on or be accommodated by a common ground that allows the quantifier to identify the binder and variable. In (41) this has the effect of forcing a common ground in which all the students in my class are understood to be female. This is a scenario, then, in which the presupposition of the anaphoric *she* does seem to introduce new information not associated with its antecedent, in violation of the Novelty Constraint. But anaphora would be allowed on the scheme presented here as long as the common ground contains the proposition that every student in my class is female, since that will entail for every value given to the index of *she* that there is exactly one female that has that value of the index. This accommodation satisfies (28) if there is no less contentful way of identifying the referential value of *she*₁. To the extent that all personal pronouns in English are gendered, there will be no less contentful alternative. To the extent that *they* or *he* aren't gendered, the system here predicts a slight knock on the use of *she* here. It will be analogous to (24), in which the *the short linguistics professor* requires an accommodation to the proposition that the heights of linguistics professors are not distributed normally.

3 Principle C

Let's now see how this account can be extended to capture Principle C. Recall that Principle C is responsible for sharpening the distinction between the good and bad cases of the repeated name constraint. That sharpening arises when the first definite description is in an A-position that c-commands the second definite description. In many of the cases that we've examined, there is no sharpening associated with the Principle C environment. The repeated name penalty is already sufficient to describe the effect.

- (43) a. * The woman's father met someone who admires Jane.
 b. * The woman met someone who admires Jane.
 (44) a. * The student's teacher met someone who admires the best student.
 b. * The student met someone who admires the best student.
 (45) a. * The poor woman's father met someone who admires the widow.
 b. * The poor woman met someone who admires the widow.

- (46) a. * The woman met someone who admires the tall woman.
 b. * The woman's father met someone who admires the tall woman.

We needn't design Principle C to govern these cases.

A less clear case arises when the anaphoric definite description is identical to the definite description it is anaphoric to, as in (47).

- (47) a. The woman's father met someone who admires the woman.
 b. The woman met someone who admires the woman.
 (48) a. No woman₁'s father met anyone who admires *the woman*.
 b. No woman₁ met anyone who admires *the woman*.

My consultants agree that the contrast between the cases in (47) and (48) is less dramatic than the contrasts in (43)-(46). But my consultants do not agree on whether there is any contrast between (47) and (48). I will put aside these cases until the end of this paper.

This leaves the contrast in (49).

This is Sandra.

- (49) a. ? Her father met someone who admires the woman.
 b. * She met someone who admires the woman.

I've embedded (49a) and (49b) into a discourse that provides a common ground which includes the propositions in (50).

$$(50) \quad CG \ni \lambda w \left\{ \begin{array}{l} \forall x \text{ named_Sandra}(x) \rightarrow \text{female}(x) \text{ in } w \wedge \\ \exists !x \text{ named_Sandra}(x) \text{ in } w \end{array} \right.$$

The first proposition in (50) expresses a convention about the name *Sandra* and the second is introduced upon utterance of *This is Sandra*. This context allows the pronouns that start (49a) and (49b) to be accommodated by the common ground that exists when they are uttered. Consider first what happens in (49a).

When the first definite description in (49a) is pronounced, it will introduce the kernel in (51).

$$(51) \quad her : K = [\lambda x \text{ female}(x)=1]$$

This can be accommodated by the common ground in (50) if *her* is taken to have Sandra as its referent. The kernel in (51) is both sufficient and necessary to identify the individual named Sandra in the common ground. The accommodation here consists in adding that Sandra is the unique female; we get from (50) (52).

$$(52) \quad CG' \ni \lambda w \left\{ \begin{array}{l} \forall x \text{ named_Sandra}(x) \rightarrow \text{female}(x) \text{ in } w \wedge \\ \exists !x \text{ named_Sandra}(x) \text{ in } w \wedge \\ \exists !x \text{ female}(x) \text{ in } w \end{array} \right.$$

When the subject of (49a) is uttered, (52) is the common ground to which the kernel in (53) must be assimilated.

$$(53) \quad her \text{ father} : K = \lambda x [\text{father_of_Sandra}(x) = 1]$$

The kernel in (53) cannot live on CG' , but it can accommodate it. This causes the state of affairs before utterance of *the woman* to be as (54) indicates.

(54) *the woman*

a. $K = [\lambda x \text{ female}(x)=1 \wedge \text{ adult}(x) = 1]$

b. $CG'' \ni \lambda w \left\{ \begin{array}{l} \forall x \text{ named_Sandra}(x) \rightarrow \text{ female}(x) \text{ in } w \wedge \\ \exists !x \text{ named_Sandra}(x) \text{ in } w \wedge \\ \exists !x \text{ female}(x) \text{ in } w \wedge \\ \exists !x \text{ father_of_Sandra}(x)=1 \text{ in } w \end{array} \right.$

The kernel in (54a) does not live on CG'' , because CG'' does not entail $\exists !x \text{ female}(x)=1 \wedge \text{ adult}(x)=1$. (There is nothing in CG'' that entails that the woman Sandra refers to is an adult.) But the kernel associated with *the woman* can be accommodated when *the woman* refers to Sandra; CG'' will be changed to CG''' .

(55) $CG''' \ni \lambda w \left\{ \begin{array}{l} \forall x \text{ named_Sandra}(x) \rightarrow \text{ female}(x) \text{ in } w \wedge \\ \exists !x \text{ named_Sandra}(x) \text{ in } w \wedge \\ \exists !x \text{ female}(x) \text{ in } w \wedge \\ \exists !x \text{ father_of_Sandra}(x)=1 \text{ in } w \wedge \\ \exists !x \text{ female}(x)=1 \wedge \text{ adult}(x)=1 \text{ in } w \end{array} \right.$

If *the woman* is taken to corefer with *Sandra*, then arguably the kernel *the woman* introduces is sufficient to identify the referent of *the woman* as Sandra. If *the woman* is not understood to corefer with *Sandra*, then its kernel is arguably not sufficient to identify its referent. For this reason, *the woman* is preferred to be understood as coreferent with *Sandra*. On the other hand *woman* is arguably not necessary to identify Sandra. That could be done with an expression that had less information in it, like for instance *her*. For this reason, an anaphoric interpretation of *the woman* in (49a) is judged less good than an anaphoric interpretation that uses *her* instead. This corresponds to the fact that speakers prefer (56) to (49a) to express coreference.

(56) *uttered after "This is Sandra"*

Her father met someone who admires her.

Note that this system will also favor anaphoric epithets to regular definite descriptions in this case. This is because epithets come with no presuppositions. The NP part of an epithet is a not-at-issue comment, one that projects like presuppositions do but doesn't engage in accommodation like presuppositions do. It asserts that the speaker has a particular kind of attitude to the referent of the epithet. This makes epithets very weak pronouns (see Patel-Grosz 2012). As expected, (57) compares favorably to (49a).

(57) *uttered after "This is Sandra"*

Her father met someone who admires the idiot.

The account therefore works for cases, like (49a), in which a pronoun preceding a stronger definite description is able to corefer with it. This happens when, as in (49a), the pronoun does not c-command the other definite description.

This system does not distinguish (49a) from (49b), where the pronoun c-commands the second definite description, and so (49a) and (49b) should have the same status. Our system does, however, explain why (49b) is disfavored relative to (58).

- (58) *uttered after "This is Sandra"*
- a. She met someone who admires her.
 - b. She met someone who admires the idiot.

This is just the same phenomena that arises when c-command of the Principle C trigger doesn't hold. We have provided, then, an account for one of the properties I highlighted about Principle C that was in need of explanation. We have an account for why the definite expressions that trigger Principle C do not include pronouns or epithets. What is missing is understanding what makes (49b) worse than (49a). Why is c-command from an A-position relevant?

For this, I would like to adopt an idea in Keenan (1974). The goal of his work was to understand why sentences like (59) are ungrammatical.

- (59) Each other insulted the men.

Keenan's suggestion hinged on the observation that the denotation of *insulted the men* is a function that takes *each other* as its argument. He suggested that what goes wrong in (59) is that the argument's value depends on resolving the denotation of the function that applies to it. The semantic value of *each other* depends on *the men*, which is part of what determines the function. He suggested that what ails (59) is a violation of what he called the Functional Principle, which disallows just this dependency between function and argument.

- (60) The Functional Principle

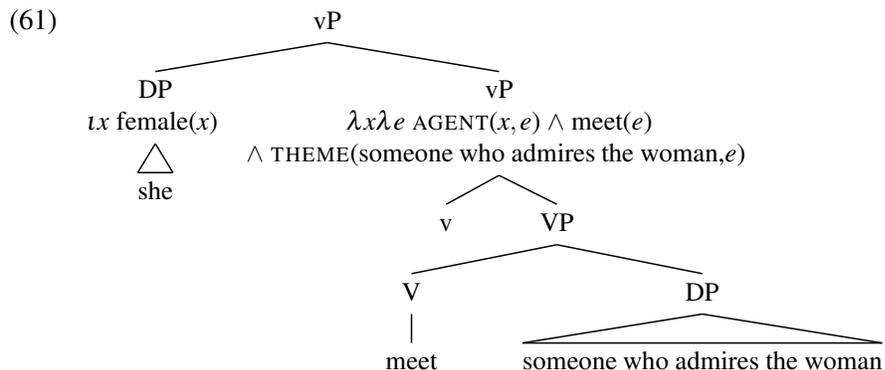
The reference of the argument expression must be determinable independently of the meaning or reference of the function symbol.

(Keenan 1974, (i) p. 298)

He suggested that this condition on natural language function application could be used to understand a variety of other effects. There are now other explanations for the ungrammaticality of (59), as well as the other effects Keenan credited it with, and the success of these explanations makes me doubt that we can safely ascribe the ungrammaticality of (59) to the Functional Principle. But the Functional Principle does seem well built for our project: distinguishing (49a) from (49b).⁷ (61)

Principle C arises just in cases where the Principle C trigger is part of the function that applies to the first definite description.

⁷ My thanks to Petr Kusily and Barbara Partee for bringing Ed Keenan's paper to my attention.



The vP's denotation in (61) is a function that takes the DP in its Specifier as an argument. In a context where a unique female individual is made salient, as in the contexts we were considering for the sentence, the referent of *she* can be determined independently of the referent of *the woman*. Strictly speaking, then, this will not violate Keenan's Functional Principle. But if we consider the presuppositions involved, something close to the spirit of Keenan's condition arises. The subject DP comes with the kernel in (62a), and the kernel from *the woman*, in (62b), will be projected to the vP containing *the woman*.

- (62) a. $K = [\lambda x \text{ female}(x)=1]$
 b. $K = [\lambda x \text{ female}(x) = 1 \wedge \text{adult}(x) = 1]$

As we saw in our examination of (49a), the kernel introduced by the pronoun lives on the common ground and the kernel introduced by *the woman* is accommodated by that common ground when *the woman* and the pronoun corefer. That accommodation adds the information that the referent of the pronoun is an adult. If we compare the two kernels, the one associated with *the woman* (=62b) does a better job of identifying the referent than does the one associated with the pronoun (=62a). There is nothing wrong with a function adding information about the referent of its argument, of course; (63) is fine.

(63) Do you know Sandra? She is an adult.

What should be blocked is when this happens by way of presuppositions. Presuppositions set the conditions under which functional application is permitted. The function f can apply to the argument a only if the presuppositions of both a and f are either accommodated by or live on the common ground. A way of expressing Keenan's idea is to make his Function Principle hold just of the conditions that allow both the function's denotation and the argument's denotation to be defined. We could frame Keenan's condition so that it requires of the background setting for function application that the conditions that define when the argument has a value cannot be weaker than the conditions that define when the function has a denotation. More particularly, the relevant conditions which determine when the function's denotation is defined must be just those that involve determining whether the argument's value is defined. That is, the presuppositions that determine when the argument's value is defined cannot be stronger than the presuppositions that determine the value of that argument and also determine when the function is defined.

Here's a stab at that.

(64) Function application definedness (FAD)

Let P_f be the kernel provided by a DP within the function f and P_a be the kernel for the argument a . If f applies to a , then P_f cannot more strongly identify the referent of a than P_a .

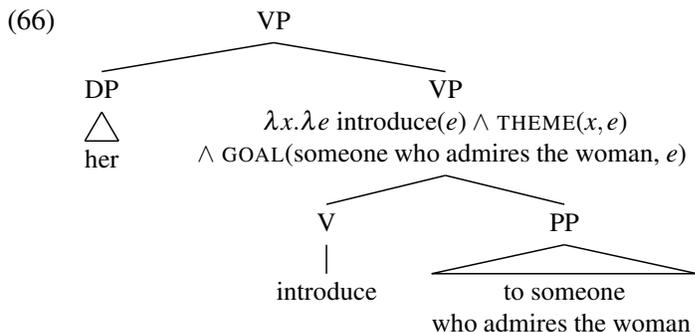
P_x more strongly identifies a referent than P_y iff the entity they hold of is the same and the existential closure of P_x entails the existential closure of P_y .

(61) violates FAD because the existential closure of (62b) ($= \exists x \text{ female}(x) \wedge \text{adult}(x)$) entails the existential closure of (62a) ($= \exists x \text{ female}(x)$), and both (62a) and (62b) hold of the same individual when *she* and *the woman* corefer. Because FAD only arises when an argument is coreferent to something that has a kernel in the function that applies to that argument, it won't arise in cases like (49a), where the argument contains the coreferent pronoun, but isn't the coreferent pronoun.

For FAD to explain why Principle C effects only show up in cases where the Principle C trigger is c-commanded by the term it is anaphoric to will require ensuring that all of the cases of c-command work out to be cases of function application instead. This isn't trivial. Direct objects, for instance, cause Principle C style disjoint reference effects for definite descriptions that follow them; (65) is an example.

(65) I introduced her to someone who admires the woman.

For FAD to apply here, explaining why *her* cannot corefer with *the woman*, there must be a function that contains *the woman* which takes *her* as its argument. In many common treatments of the semantics of this example, this is not the case. But there are semi-successful semantics for (65) that do have that property. In Larson (1988), for instance, *introduce* combines with the indirect object first, forming a function that then takes *her* as its argument, as in (66).

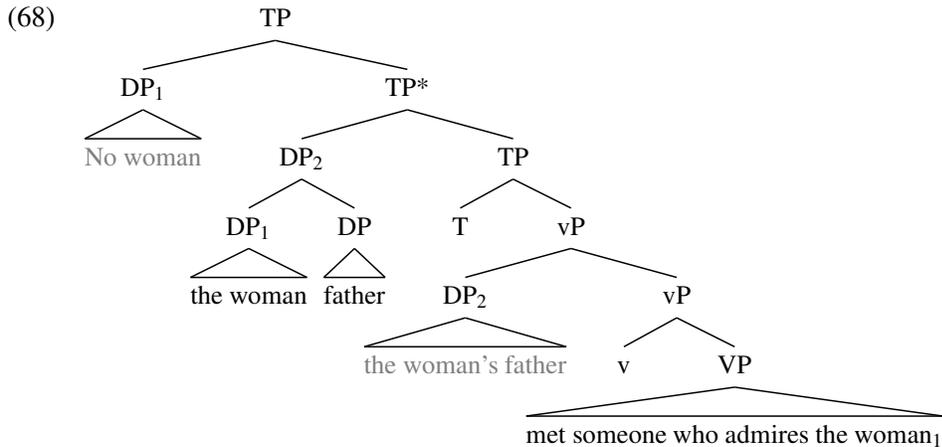


On Larson's view, the syntax involves a movement operation that brings *introduce* into a position to the left of *her*. The semantics, however, tracks the parse in (66). If FAD is correct, it will require that examples such as (65) work in a way similar to Larson's proposal.

Finally, let's consider cases involving bound variable interpretations of definite descriptions. For some, there is a contrast between the examples in (67).

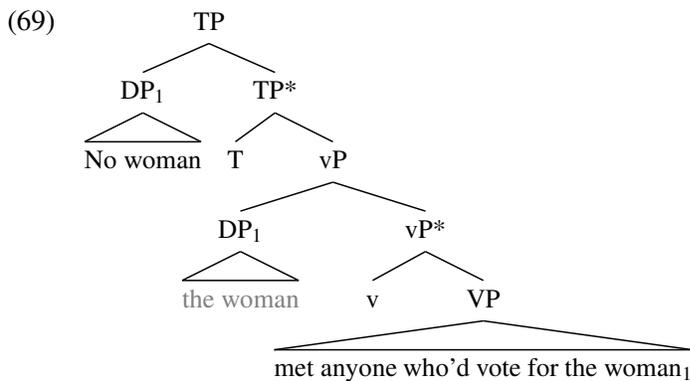
- (67) a. ? No woman₁'s father met anyone who'll vote for the woman₁.
- b. * No woman₁ met anyone who'll vote for the woman₁.

Let's consider the syntactic representations that are relevant for determining the meanings of these sentences. We will look, therefore, at the representations that arise when QR has done its job. I will also adopt the copy theory of movement (any movement theory which gives its traces presuppositions will do). The representation for (67a) is (68).



On the copy theory of movement, a DP leaves a matching definite description in the position it moves from and this definite description is coindexed and bound by the moved DP. (See, e.g., Engdahl 1980, Fox 2002, 2003, and Sauerland (1998).) Depending on what kind of movement is involved, the moved phrase will be pronounced in the position it is moved to, or in the position that the definite description it binds resides in. I've indicated which positions include spoken material by leaving them unshaded. Note that in the position of the bound definite description resulting from QR is the quantificational phrase: *no woman*. On standard treatments of quantifiers, *no woman* is a function that takes TP* as its argument. The FAD will not look at this combination partly because *no woman* has no presuppositions relevant to identifying its referent and partly because *no woman* has no referent. For a similar reason, the combination of *the woman's father* with either TP or vP does not raise the spectre of FAD since *the woman's father* will not be coreferent with *the woman*.

Consider by way of contrast, now, (67b), whose syntactic representation is (69).



As with (68), FAD will not play a role in determining whether the DP *no woman* can apply to TP*. But it will play a role in determining whether vP* can apply to *the woman*₁. The kernel associated with *the woman*₁ is in (70a), and the kernel that vP inherits from *the woman*₁ within it is the identical (70b).

- (70) a. $\lambda x \text{ female}(x)=1 \wedge \text{ adult}(x)=1 \wedge g(1)$
 b. $\lambda x \text{ female}(x)=1 \wedge \text{ adult}(x)=1 \wedge g(1)$

Because the existential closure of (70b) entails the existential closure of (70a), FAD is violated. For those speakers who find a contrast between these examples, this is what the proposal here predicts. Note that we have now derived the fact that it is the position from which QR happens that matters for Principle C, and not the position the QRd DP moves to. This is how I believe we can derive Chomsky’s proposal that Principle C sees only A positions. Perhaps Chomsky’s A positions are just those positions that are arguments of functions that FAD applies to.

For those speakers who do not find a contrast between (67a) and (67b), we can adopt a different definition of “more strongly identifies.” The present formulation of FAD prevents function application if the relevant kernel in the function entails the kernel of the argument, when they are existentially closed. This requires, as just seen, that the relevant kernels not be equivalent. For those idiolects that find the cases of binding like (67b) grammatical, but still disallow pronouns from coreferring with c-commanded definite descriptions, I suggest a slightly more stringent definition of “more strongly identifies.”

- (71) P_x more strongly identifies a referent than P_y iff the entity they hold of is the same and the existential closure of P_x entails the existential closure of P_y and the existential closure of P_y does not entail the existential closure of P_x .

This version of “more strongly identifies” will allow the two presuppositions that are being compared to be identical (because in that case there will be mutual entailment under existential closure), and this will allow (69). But it will continue to block cases where the existential closure of the function’s presupposition asymmetrically entails the existential closure of the argument’s presupposition. That is what happens in cases where the argument is a pronoun coreferent with a non-pronominal or epithetic definite description within the function that applies to it.

4 Summary

I have tried to sketch out a way to formulate the penalty that arises when a definite description is taken to be coreferent with a previous referring expression. I’ve focused on how this “repeated name” condition is sensitive to the semantic content of the NPs they contain. I’ve suggested that this sensitivity to the content of the NPs arises because the relevant condition is one on how presuppositions are used. I’ve tried to make the engine that determines when presuppositions introduced by NPs are accommodated or enforced responsible for the repeated name condition. Seating the condition in the realm of presuppositions explains why epithets, which do not invoke presuppositions or the need to accommodate them, do not invoke the repeated name condition.

With this idea about the repeated name condition in place, the view of Principle C changes. It is no longer a blanket condition on pairs of referring expressions. Many of the cases Chomsky credited to Principle C are nothing more than the repeated name condition. The cases of Principle C that remain are ones in which the

Principle C trigger is richer in semantic content than its putative antecedent. Principle C is one that disallows a richer DP from being c-commanded by a coreferent, but less rich, DP. This image of Principle C is very close to the one that Lasnik (1989) arrives at for Thai. I discuss how an idea of Ed Keenan's can be modified to derive this narrower Principle C. The modification again places the action at the level of presupposition accommodation, and thereby explains why epithets also escape Principle C effects.

Because both the repeated name condition and Principle C involve judging when presuppositions can and cannot be accommodated given the presuppositions of previously occurring DPs, they both invoke the same sensitivity to the semantic content of the NPs within those DPs. The repeated name condition and Principle C are formally distinct. But their causes come from the same engine that compares the unfolding effects on the common ground that the presuppositions of definite descriptions have. This explains, I hope, the similar sensitivity each has to the semantic content of the DPs whose coreference is being blocked.

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