

Deletion, Deaccenting, and Presupposition

by

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Submitted to the Department of Linguistics and Philosophy
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at the

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ABSTRACT

In this dissertation, I examine the effects of deaccenting – the removal of phonological accent from a constituent – on interpretation. In general, deaccenting of an element is possible only if that element is salient in the discourse context. Salience alone, however, is not a sufficient condition for deaccenting. The discourse context in (1) makes salient both the verb *hit* and the NP *John*, and it is consequently possible for these elements to be deaccented in (1a,b). However, in (1c), it is not possible to deaccent both of these elements simultaneously. (Focus is indicated by CAPITALIZATION, deaccenting by *small italics*.)

- (1) Mary hit John. Then,
a. BILL *hit* SUE.
b. BILL KICKED *Mary*.
c. #BILL *hit* *Mary*.

Deaccenting of both the verb *hit* and its direct object *Mary* in (1c) requires that the discourse context make salient a hitting of *Mary*, but this condition is not met in (1).

To account for the facts illustrated above, I propose that deaccenting plays a role in identifying the focus-related topic of a sentence, where it is a necessary condition for a sentence to be felicitous in a given context that the focus-related topic of that sentence be instantiated in the context. The focus-related topic of a sentence is generated (roughly) by replacing all focused constituents by variables and combining the resulting structure so as to end up with the smallest structure within which all properties of the remaining lexical elements are satisfied. The resulting structure will be instantiated in a context if there is another element in the context with which it is non-distinct, where variables count as non-distinct from other elements of the same semantic type. By this process, the sentences in (1) will have the focus-related topics in (2).

- (2) a. x hit y
b. *Mary*
c. x hit *Mary*

The representations in (2a,b) are instantiated in the context consisting of the sentence *Mary hit John* in (1) above, and hence (1a,b) are felicitous. (2c), however, is not instantiated in this context, and hence is infelicitous.

The analysis sketched above provides an explanation for the felicity or infelicity of a sentence in a larger discourse context based upon the focus structure of the sentence and the composition of the context. While the analysis is of some interest by itself, even more important is the use to which the analysis can be put in accounting for certain phenomena typically associated with VP deletion. Since Sag (1976) and Williams (1977), it has standardly been assumed that restrictions on pronominal interpretations in VP deletion contexts are to be explained in terms of the mechanism that assigns an interpretation to an empty VP. However, we find that identical restrictions appear in contexts in which a VP has been deaccented but not deleted. Thus, parallel to the sentence in (3a) which has only a strict and a sloppy reading available for the (deleted) pronoun, we find an identical restriction for the deaccented pronoun in (3b).

- (3) a. John_i said he_i is a genius because Bill did.
b. John_i said he_i is a genius because Bill *said he's intelligent*.

No analysis of VP deletion in the current literature is capable of accounting for this parallelism. If we assume that a phonologically deleted VP is represented in the LF representation of a sentence as a deaccented VP, however, it becomes possible to account for this parallelism in a principled fashion by assimilating the deletion cases to the deaccenting ones.

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Chapter 1

VP Deletion: The Problem

1.1 Introduction

It has long been noted that deletion of a verb phrase requires that there be a suitable “antecedent” VP in the discourse, and that the interpretations available for a deleted VP in a VP ellipsis construction are constrained by the interpretation assigned to the antecedent.¹ Sag (1976) observes for example, citing Chomsky (1965,1968), Ross (1967), Lakoff (1968) and Hankamer (1971), that ambiguities do not multiply in VP ellipsis contexts. He gives the following examples of VP ellipsis in which the antecedent VP is two ways ambiguous, and points out correctly that in each case the sentence as a whole is only two ways ambiguous.

- (1) (= Sag’s (2))
- a. John likes flying planes, and Bill does too.
 - b. Betsy divulged when Bill promised to call me, and Sandy did too.
 - c. The chickens are ready to eat, and the children are too.

The elided VP in each of these sentences is ambiguous just as its antecedent is, but the interpretation assigned to the elided VP has to be identical to that assigned to the antecedent. While one might be tempted to attribute this identity of interpretation to

¹Here and throughout this chapter, I will refer to the licensing VP as the *antecedent*. I do not, however, intend to thereby commit myself to there being a direct connection between the licensing VP and the elided VP, and will in fact be arguing in chapter 3 that no such relation is directly represented in the grammar.

the presence of the word *too* in each of these sentences, the examples in (2) argue strongly against any such account.

- (2)
- a. John likes flying planes because Bill does.
 - b. Betsy divulged when Bill promised to call me because/before Sandy did.
 - c. The chickens were ready to eat when the children were.

None of these examples contains the word *too*, and yet in each case we find that the interpretation of the elided VP must be identical to the interpretation of the antecedent VP.

Analyses like those of Sag (1976,1977) and Williams (1977) are based on the premise that identical interpretation of a deleted VP and its antecedent should follow from the analysis of VP deletion itself. For Sag, VP ellipsis is analyzed as a deletion process which is subject to a constraint that the interpretation of the deleted VP must be present already in the previous discourse. For Williams, VP ellipsis is treated as a reconstruction process which copies an antecedent VP onto an elided VP. Since the interpretation of the antecedent VP must already be resolved before deletion is licensed (Sag) or before reconstruction occurs (Williams), given a particular interpretation for the antecedent VP in sentences like (1) and (2), the interpretation of the elided VP under either of these analyses is predicted to be fixed.

In all of the above examples, the antecedent VP was syntactically two ways ambiguous and obviously so, giving rise to a two way ambiguity for the sentence as a whole. However, as has long been known, examples in which an antecedent VP contains a pronoun can also give rise to an ambiguity in VP ellipsis. In particular, in certain cases in which the pronoun in the antecedent VP is understood as coreferent with some other expression in that sentence, the corresponding VP ellipsis sentence can receive any of a number of non-equivalent interpretations, and yet the interpretation of the antecedent VP does not on the surface appear to be similarly ambiguous. Examples illustrating this point are given in (3), where the coindexing in the antecedent VP is meant to indicate intended referential identity between the pronoun *he* and the R-expression *John*.

- (3) a. John_i thinks he_i is brilliant and Bill does too.
b. John_i thinks he_i is brilliant because Bill does.
c. John_i said he_i is brilliant before Bill did.

In all of these sentences, fixing the intended referent of the pronoun as that of the matrix subject *John* would appear to yield an unambiguous interpretation for the antecedent VP. The corresponding pronoun in the elided VP, however, gives rise to an ambiguity in the interpretation of these sentences: the elided pronoun can either be interpreted as referring to *John* (a strict interpretation), or it can be interpreted as referring to *Bill* (a sloppy interpretation). Sag and Williams reduce this case to the previous set of cases by arguing that the antecedent VP is in fact ambiguous. Pronouns, they argue, can be given either a *bound variable* interpretation or a *referential* interpretation. When a pronoun is given a bound variable interpretation in an antecedent VP, Sag's identity constraint on VP ellipsis forces a bound variable interpretation in the deleted VP as well, while Williams' reconstruction analysis copies a bound variable, giving rise to a sloppy reading. When a pronoun is given a referential interpretation in an antecedent VP, Sag's identity constraint forces a referential interpretation in the deleted VP as well, and Williams' analysis copies a referentially interpreted pronoun, giving rise to a strict reading.²

Central to the above analyses – and to virtually every other analysis of these facts within the generative tradition – is an assumption that the resolution of ambiguities arising in VP deletion contexts should be made to follow directly from the analysis of VP deletion itself. (Cf. for example Sag (1976), Williams (1977), Lappin (1984), Haik (1985), Ristad (1991), Fiengo and May (1991), Dalrymple, Shieber and Pereira (1991), and Dalrymple (1992), among others.) There are only two exceptions to this generalization that I am aware of. The first of these is Kitagawa (1991), who argues that VP deletion should be handled via reconstruction of syntactic material (similar to Williams' approach) with pronominal interpretation within VP deletion environments

²I ignore the distinction between deictic uses of a pronoun which introduce a new referent into discourse and other referential uses in which a pronoun is used to refer to some individual previously introduced into the discourse.

constrained only by Binding Theory constraints which operate independently.³ The other exception to the above generalization is found in a suggestion made in Chomsky and Lasnik (1992). They argue that deletion should be treated as an optional phonological rule which applies to deaccented material (i.e. material which lacks phonological accent). Accounting for the constraints on ambiguity resolution in VP deletion contexts for them falls under the more general problem of accounting for parallelisms of interpretation found quite generally in deaccenting environments. In this chapter, I will argue that these latter theories are correct in not locating the source of parallelism of interpretation directly in the mechanisms posited to account for the interpretation of deleted material in VP deletion contexts.

The argument I will present is of a very general nature. My first concern will not be to argue against any particular analysis of VP deletion. Rather, it will be to show that all of the above mentioned analyses (including those of Kitagawa and of Chomsky and Lasnik) have too narrowly delimited the problem to be solved. I will show, following the lead of Chomsky and Lasnik, that a large fraction of the problems involving parallelism of interpretation which are central in motivating analyses of VP deletion arise in an identical fashion when the “dependent” VP is deaccented rather than deleted. This is true both of the basic cases which parallel those illustrated in (1) above and of the more complicated cases of pronominal interpretation, as well as of cases discussed in Lasnik (1972) and Lakoff (19??) (cited in Chomsky and Lasnik) involving quantifier scope. None of the above-mentioned analyses can be directly extended to cover the facts that obtain in the VP deaccenting cases without the addition of several *ad hoc* stipulations. Since one of the primary reasons for adopting any of these theories has been their ability to account for both the parallelism of interpretation in the ambiguous antecedent cases and for the ambiguities of pronominal interpretation within an ellipsis site, this failing calls the analyses themselves into question. I will argue that any account of the parallelism between the ellipsis cases and the deaccenting cases must treat the deaccenting cases as basic.

³As we will see below, however, there do appear to be constraints on pronominal interpretation in VP deletion contexts which are completely independent of Binding Theory constraints, for which Kitagawa offers no explanation.

The remainder of this dissertation is organized as follows. In section 1.2, I will outline three competing theories of VP ellipsis, those of Sag (1976,1977), Williams (1977) and Dalrymple, Shieber and Pereira (1991). The purpose of this section will be to underscore the dependence present in each of the theories between ambiguity resolution in VP ellipsis contexts and the analysis of VP ellipsis itself. In the following section, I will show that parallel restrictions on ambiguity resolution obtain in deaccenting environments, and will furthermore show that the account given of the restrictions in the VP ellipsis cases cannot be extended directly to cover these cases as well. I argue that any analysis which accounts for the parallelism between the VP ellipsis cases and the deaccenting cases in a principled fashion must treat the deaccenting cases as basic and reduce the analysis of ambiguity resolution in VP ellipsis cases to that in their corresponding deaccenting cases. I develop such an analysis in chapter 2. There I show that the basic function of deaccenting is to identify the topic of a sentence, with topics serving to relate a sentence to a context of utterance. Finally, in chapter 3 I return to the problems raised above and show how the analysis of ambiguity resolution in deaccenting and ellipsis contexts can be given a natural explanation in terms of the analysis of topics developed in chapter 2.

1.2 Previous Analyses of VP Ellipsis

In this section, I review three theories of VP ellipsis – Sag (1976,1977), Williams (1977), and Dalrymple, Shieber and Pereira (1991). The review in this section is far from exhaustive, meant more to illustrate the basic ideas motivating these theories rather than the details of how they are worked out. As such, I will only be applying these theories to the basic examples given above that illustrate restrictions on interpretation of a deleted VP. A somewhat more detailed examination of restrictions on interpretation in VP ellipsis contexts will be taken up in chapter 3.

1.2.1 Sag: A Deletion-based Analysis of VP Deletion

As mentioned in the introduction to this chapter, Sag (1976,1977) treats VP deletion as deletion. That is, he assumes that the base generated form of a VP deletion sen-

tence contains a full-fledged VP in the ellipsis site, and that this VP gets deleted in the phonological component of the grammar. To illustrate, consider the following sentences:⁴

- (4) a. John said he is brilliant before Bill did.
b. John likes flying planes because Bill does.

The facts in need of explanation for these sentences are the following. In (a), if the pronoun in the matrix VP is understood as referring to *John*, then the corresponding pronoun in the deleted VP can be interpreted as referring either to *John* or to *Bill*, but cannot be reinterpreted as taking some other discourse antecedent. If the original pronoun in the matrix clause is given a discourse antecedent, on the other hand, the corresponding pronoun in the deleted VP must be interpreted as having that same discourse antecedent. It cannot be reinterpreted as having a separate discourse antecedent, nor can it be understood as referring to *John* or to *Bill* (unless the discourse antecedent itself is taken to refer to *John* or *Bill*). In (b), the matrix VP is two ways ambiguous between what we could refer to loosely as an activity reading of *flying planes* and what could be called an object reading of that phrase. The deleted VP shows the same ambiguity. However, the interpretation of the deleted VP is dependent on that of the matrix VP – the two VPs must be interpreted identically. Thus the sentence is only two ways ambiguous, and not four ways as one might expect if the two VPs could be interpreted independently.

On Sag's analysis, these sentences have an underlying representation containing a full-fledged VP in the subordinate clause, as illustrated below.

- (5) a. John said he is brilliant before Bill said he was brilliant.
b. John likes flying planes because Bill likes flying planes.

This representation is the input to both the phonological component of grammar and the logical component of grammar. In the phonological component, the VP in the subordinate clause gets deleted. In the logical component, both VPs enter with their complete

⁴I ignore problems related to tense and/or to the presence or absence of *do* here and throughout this section. These problems are by no means trivial, though they are irrelevant to considerations of this and the following section.

structure intact. If interpretation of the two VPs were left unconstrained, then in the first example we would expect the interpretation of the pronoun in the matrix VP and that of the pronoun in the subordinate VP to be independent, and similarly in the second example, we would expect each of the VPs to be interpreted separately, giving rise to a potential four way ambiguity. We noted above, however, that in sentences like (4a) interpretation of the pronoun in the deleted VP is restricted, while sentences like (4b) are only two ways ambiguous. The VPs in the subordinate clause cannot receive an interpretation which is independent of the interpretation assigned to their antecedents in the superordinate clause.

In order to make a deletion account viable, Sag argues that deletion in the phonological component must be semantically constrained. In particular, he argues that a VP can be deleted only if its interpretation is identical up to the point of alphabetic variance with that of its antecedent. He states this constraint as follows:

- (6) (= Sag's (12))
 With respect to a sentence S, [VP deletion] can delete any VP in S whose representation at the level of logical form is a λ -expression that is an alphabetic variant of another λ -expression present in the logical form of S or in the logical form of some other sentence S', which precedes S in discourse.

Alphabetic variance is defined as:⁵

- (7) Formulae ϕ and ϕ' are **alphabetic variants** if there are formulae $\phi_0, \phi_1 \dots \phi_n$ such that ϕ_0 is ϕ , ϕ_n is ϕ' , and, for each i from 1 to n , ϕ_i is formed from ϕ_{i-1} by replacing some constituent λ -expression $[\lambda\alpha_i\psi_i]$ by an immediate alphabetic variant $[\lambda\alpha'_i\psi'_i]$ thereof.
- (8) $[\lambda\alpha\psi]$ and $[\lambda\alpha'\psi']$ are **immediate alphabetic variants** if ψ and ψ' are alike except that ψ' contains free occurrences of α' at all and only those places where ψ contains free occurrences of α .

In order for the restriction in (6) to do the work it is intended to, both the deleted VP and the antecedent VP must be represented as λ -expressions at the level of logical

⁵This definition is based on a definition given in Quine (1947), modified to apply to a language with λ -abstraction. To keep things simple, I assume that the formal representation of quantification involves a λ -abstracted predicate as an argument of a quantified expression.

form. We must thus assume that in the derivation of logical forms, λ -abstraction applies at least optionally to all VPs. This assumption alone suffices to ensure proper interpretation of (4b) – the LF representations of the superordinate and subordinate clauses will be alphabetic variants of each other only if they are structurally identical. Since the ambiguity in question is itself structural, forcing identity of structure at LF will result in identity of interpretation, giving the desired two readings of the sentence. To generate the strict and sloppy readings available in (4a), however, two further assumptions are required. First, it is necessary to assume that pronouns are potentially ambiguous between a bound variable interpretation and a referential interpretation.⁶ Second, we must assume that pronominal interpretation is obligatorily resolved prior to application of the constraint in (6). With these assumptions, derivation from the base generated structures in (5) of logical forms which license deletion of the subordinate VP will proceed as follows:

⁶Referring to the second type of interpretation available for a pronoun as “referential” is misleading, though the practice is commonplace throughout the literature. Within a syntactic theory, the notion of reference can play no role. Reference is an inherently semantic notion, linking an occurrence of a singular term with a real world object. Syntax, on the other hand, abstracts away from the real world, and so the symbols used in syntactic representations are necessarily abstract as well. Calling an interpretation of a pronoun referential, then, clearly cannot mean substituting an actual referent – i.e. a real world individual – in for the pronoun in the syntactic representation of the sentence containing the pronoun. The simplest way of avoiding this confusion while maintaining the basic insight of Sag and Williams analyses is to treat the so-called referent as a discourse referent of the sort posited in Kamp’s Discourse Representation Theory, or as a file in Heim’s theory of file change semantics. While I will continue to use the term “referential” in identifying this type of interpretation, I do not intend the term to be taken literally in these contexts.

- (9) a. **(underlying structures)**
- i. John said he is brilliant before Bill said he is brilliant.
 - ii. John likes [PRO flying planes] because Bill likes [PRO flying planes]
 John likes [NP flying planes] because Bill likes [NP flying planes]
- b. **(λ -abstraction of the (relevant) VPs)**
- i. John $\lambda x[x \text{ said he is brilliant}]$ before Bill $\lambda y[y \text{ said he is brilliant}]$
 - ii. John $\lambda x[x \text{ likes [PRO flying planes]}]$ because Bill $\lambda y[y \text{ likes [PRO flying planes]}]$
 John $\lambda x[x \text{ likes [NP flying planes]}]$ because Bill $\lambda y[y \text{ likes [NP flying planes]}]$
- c. **(pronominal interpretation)**
- i. John $\lambda x[x \text{ said } x \text{ is brilliant}]$ before Bill $\lambda y[y \text{ said } y \text{ is brilliant}]$
 John $\lambda x[x \text{ said John is brilliant}]$ before Bill $\lambda y[y \text{ said John is brilliant}]$
 John $\lambda x[x \text{ said Sam is brilliant}]$ before Bill $\lambda y[y \text{ said Sam is brilliant}]$
 - ii. (does not apply)
- d. **(check for identity between VPs)**

Only those derivations which pass Sag's identity constraint are given. In the first representation in (9c.i), the pronouns have been interpreted as bound variables, giving a sloppy interpretation. In the second and third representations in (9c.i), the pronouns have been interpreted referentially. In each of these representations, in order for the two VPs to be alphabetic variants, it is necessary for the two pronouns to be interpreted identically. No other combination of pronominal interpretation in the matrix and subordinate VPs will result in the two being alphabetic variants of one another, and hence the impossibility of any substantively distinct interpretation for the VP deletion sentence in (4a) is derived. For the second sentence, since the logical forms associated with the different interpretations of the VP are structurally distinct, the sentence as a whole will only pass Sag's identity criterion if each of the VPs is assigned the same structure, and hence given the same interpretation. We thus account for the fact that the VP deletion sentence in (4b) is only two ways ambiguous, as desired.

An obvious characteristic of Sag's analysis is that it makes essential use of semantic information to constrain what on the surface would appear to be a phonological process of deletion. If such constraints are found to be necessary, however, then the overall organization of the grammar will have to be radically revised. Under most current conceptions

of the organization of grammar, the phonological component and the interpretational component are related only indirectly via S-structure. Accordingly, properties of a representation which are exclusively present in the post-S-structure levels of one branch of syntax (e.g. the interpretational branch) are in principle unavailable to the other branch (e.g. the phonological branch). Since the constraints on phonological deletion posited by Sag make essential reference to aspects of a derivation which are purely interpretational, adopting his analysis would require us to abandon our underlying assumptions about the organization of grammar. Such a drastic measure should be avoided if possible. If we maintain our assumptions about the organization of grammar, however, it follows that Sag's analysis cannot be maintained without modifications.

To give an overview, Sag's analysis can be seen as an attempt to salvage what is probably the simplest account of VP deletion one could imagine, one in which deletion is constrained by identity. He notes, however, that there are restrictions on interpretation of a deleted VP when the antecedent VP is ambiguous or when it contains a pronoun. To account for these restrictions, Sag proposes that the notion of identity which is important for determining when a VP can be deleted is that of identity of interpretation, *not* merely phonological identity or identity of underlying form. Using identity of interpretation to condition VP deletion, however, comes at a theoretical cost, since deletion for Sag is a phonological rule and phonological rules cannot under current conceptions of grammar be subject to purely semantic constraints.

1.2.2 Williams: A Reconstruction-based Analysis of VP Deletion

The analyses of Sag (1976) and of Williams (1977) are similar in several respects, though they are not notational variants of one another. With respect to the interpretation of pronouns, the two theories are alike. However, whereas Sag argues for a deletion based analysis of VP ellipsis, Williams argues for a reconstruction based analysis. Like Sag, Williams forms λ -abstracts from VPs in logical form. Rather than utilizing these λ -expressions for checking identity between two VPs, however, Williams assumes that

the elided VP is base generated with empty terminal nodes, and that the λ -expression representing the antecedent is copied directly onto this empty VP. To give a sample derivation, consider once again the examples examined in section 1.2.1, repeated below.⁷

- (4) a. John said he is brilliant before Bill did [e].
 b. John likes flying planes because Bill does [e].

Consider first the derivations allowed for the sentence in (4a). At LF, λ -abstraction applies to the matrix VP yielding a representation like that given in (10a) below. At this point, the pronoun is interpreted, and as was the case with Sag's analysis, it can be interpreted referentially as in (10b.i-ii), or it can be interpreted as a variable bound by a λ -operator as in (10b.iii). Finally, the interpreted VP of the superordinate clause is substituted for the empty VP in the subordinate clause, leading eventually to the LF representations in (10c).

- (10) a. John; $\lambda x(x \text{ said he; is brilliant})$
 b. i. John $\lambda x(x \text{ said John is brilliant})$
 ii. John $\lambda x(x \text{ said Sam is brilliant})$
 iii. John $\lambda x(x \text{ said } x \text{ is brilliant})$
 c. i. ...before Bill $\lambda x(x \text{ said John is brilliant})$
 ii. ...before Bill $\lambda x(x \text{ said Sam is brilliant})$
 iii. ...before Bill $\lambda x(x \text{ said } x \text{ is brilliant})$

Of these three interpretations, the first represents a strict reading of the pronoun, the second a variant strict reading, and the third a sloppy reading, which as we have already seen exhaust the range of possible interpretations for this sentence.

For the sentence in (4b), the derivation is equally simple. Since the matrix VP is structurally ambiguous, there will be two underlying representations for this VP, as shown in (11a) below. At LF, λ -abstraction applies to the superordinate VPs as illustrated in

⁷As mentioned, Williams assumes that the empty VP following *does* is generated with the full syntactic structure of the antecedent with empty terminal nodes. Since this part of his analysis is irrelevant to the present discussion, however, I will represent the empty VP simply as [e].

(11b), and the resulting λ -expressions are copied onto the empty VP in the subordinate clause as shown in (11c).

- (11) a. **(underlying representation)**
i. John likes [PRO flying planes] because Bill does [e].
ii. John likes [_{NP} flying planes] because Bill does [e].
- b. **(λ -abstraction)**
i. John $\lambda x[x$ likes [PRO flying planes]] because Bill does [e].
ii. John $\lambda x[x$ likes [_{NP} flying planes]] because Bill does [e].
- c. **(reconstruction)**
i. John $\lambda x[x$ likes [PRO flying planes] because Bill does $\lambda x[x$ like [PRO flying planes]]
ii. John $\lambda x[x$ likes [_{NP} flying planes]] because Bill does $\lambda x[x$ like [_{NP} flying planes]]

Since at the level at which reconstruction applies the antecedent VP is no longer ambiguous, it follows straightforwardly that there will only be two readings available for the sentence as a whole.

The similarities between Williams' and Sag's analyses are quite apparent. There are, however, important distinctions between the two. For Sag, the fact that an identity constraint applies in the case of VP deletion is in a sense accidental – there is no necessary connection between deletability of an expression and identity between that expression and some antecedent, nor is there any reason to suspect that a similar constraint would not apply to other phonological processes. For Williams, on the other hand, the identity constraint is built into the very mechanism which accounts for the interpretation of a deleted VP. This constraint comes about by requiring the interpretation of an antecedent VP to be fully determined prior to copying it onto an empty VP.

1.2.3 Dalrymple, Shieber and Pereira: VP Deletion as Pronominal Interpretation of an Empty VP

Dalrymple, Shieber and Pereira (1991) (henceforth DS&P) present an analysis of VP deletion which is couched in a more general theory of ellipsis resolution. Like Williams, DS&P derive the interpretation of an empty VP from an antecedent. However, the

mechanism by which they do so is quite different from that of Williams. Rather than treating ellipsis resolution as a copying procedure applying to syntactic representations, they treat it as a form of pronominal interpretation in which the interpretation assigned to the empty VP is calculated from the semantic interpretation of some antecedent sentence. The basic analysis splits a VP deletion sentence into two semantic components, the first consisting of the interpretation assigned to the overt material of the sentence (e.g. of a subject NP), and the second consisting of an empty predicate whose interpretation needs to be provided. A parallel division is then imposed on the antecedent sentence, where the first part must be semantically composed of items parallel to those contained in the overt part of the VP deletion sentence, and the predicate of the second part when applied to the first must yield the original interpretation of the (antecedent) sentence. The interpretation of the empty VP of the VP deletion sentence is then identified with this predicate which constitutes the second part of the antecedent sentence. When applied to the overt part of the VP deletion sentence, the interpretation of the VP deletion sentence as a whole is derived. This procedure can be schematized as follows. Analyze a VP deletion sentence ψ as a function P which applies to a list of arguments α^* , where α^* contains all the overt material of the sentence. Then, identify an antecedent sentence φ which can be similarly broken down into a function P' and a list of arguments α'^* such that $P'(\alpha'^*) =$ the interpretation of φ , and such that α'^* and α^* are parallel (in some sense yet to be specified). The interpretation of the VP deletion sentence can then be given by identifying P with P' and applying P to α^* .

The analysis of ambiguities related to pronouns under this analysis derives from an indeterminacy in the value of P' . DS&P assume that all pronouns receive a uniform interpretation, which for our purposes can be identified with the referential interpretation of Sag and Williams. A sentence which contains a pronoun and which is otherwise unambiguous will thus have a unique semantic interpretation for each referential value assigned to the pronoun. The potential for ambiguity in a VP deletion sentence arises whenever the antecedent sentence contains two referential expressions which have the same semantic value, one of which is contained in the parallel part α'^* and the other of which is not. Under such circumstances, there will in general be two values for P' which are

non-equivalent but which applied to α^* yield the same original semantic interpretation as that of φ .

To illustrate the above mechanism for ellipsis resolution, consider once again our familiar cases of VP deletion from (4), repeated below.

- (4) a. i. John said he is brilliant before Bill did [e].
ii. John likes flying planes because Bill does [e].

Since the interpretation of the elided VP is derived from the partial semantic interpretation of the VP ellipsis sentence and the complete semantic interpretation of the antecedent sentence, the first step in deriving the interpretation of the elided VP is to give these semantic interpretations. I give these interpretations below, where I restrict my attention in (i) to interpretations in which the pronoun is interpreted as *john*.

- (12) a. i. said(john,brilliant(john))
ii. likes(john,flying(john,planes))
likes(john,flying-planes)
b. i. Q(bill)
ii. Q(bill)

The next step in generating an interpretation for the empty material in the subordinate clause is to split the VP deletion sentence into two semantic parts, one consisting of the interpretation of the overt subject *Bill* ($= \alpha^*$) and another consisting of the interpretation of the empty VP ($= P$), represented above as the variable Q. Having made this division in the VP deletion clause, we next impose a similar division in the antecedent clause, where the element(s) corresponding to *Bill* (i.e. α^*) in the antecedent clause must be parallel to this element (where parallelism can be taken to be defined structurally for our purposes). DS&P refer to such parallel elements as *primary occurrences*, which in our examples are the subjects *John* and *Bill*. Thus, corresponding to the division in the VP deletion clause will be a division of the antecedent clause into a (list of) parallel element(s) α^* consisting of the single element *john* and a predicate P' which when applied to α^* must yield the relevant interpretation in (12). That is, P' will have to satisfy one of the following equations.

- (13) i. $P'(\text{john}) = \text{said}(\textit{john}, \textit{brilliant}(\textit{john}))$
 ii. $P'(\text{john}) = \text{likes}(\textit{john}, \textit{flying}(\textit{john}, \textit{planes}))$
 $P(\text{john}) = \text{likes}(\textit{john}, \textit{flying-planes})$

In solving for P' , DS&P put two restrictions on the solution. First, all primary occurrences in the interpretation of the antecedent sentence must be λ -abstracted, and second all controlled arguments must also be λ -abstracted. I indicated these expressions in (13) by writing them in italics. To account for the control structure in (ii), DS&P additionally assume that all identically interpreted occurrences that get abstracted get substituted for by the same variable. The restrictions on P' , however, stop there. In our current examples, this leaves us with a choice of solutions for the value of P which includes the possibilities given in (14e).

- (14) i. $P' = \lambda x. \text{said}(x, \textit{brilliant}(\textit{john}))$
 $P' = \lambda x. \text{said}(x, \textit{brilliant}(x))$
 ii. $P' = \lambda x. \text{likes}(x, \textit{flying}(x, \textit{planes}))$
 $P' = \lambda x. \text{likes}(x, \textit{flying-planes})$

For the (i) example, the two (classes of) solutions to this equation given are non-equivalent. In the one solution, the non-primary occurrence of *john* in (13i) keeps its referential value. In the other solution, this non-primary occurrence of *john* gets abstracted along with the primary occurrence, and thus gets treated as a variable bound by the same λ -operator. For each of the two equations given in (13ii), all solutions for P' come out equivalent. Solutions to the first equation will be equivalent to the value of P' given in the first equation in (14ii), while solutions to the second equation will be equivalent to the value of P' given in the second equation in (14ii).

We have now generated the interpretations which are to be equated with the interpretation of the empty VPs in the subordinate clauses in our original sentences in (4). The interpretations assigned to these sentences as a whole can be given by applying the predicate P' just generated to the parallel element in the phrase containing the ellipsis site, in our examples *Bill*. This step is illustrated in two parts below, with substitution of P' in place of P (= Q from (12) above) illustrated in (15a) and the result of λ -conversion given in (15b).

- (15) a. i. $\lambda x.\text{said}(x,\text{brilliant}(\text{john}))[\text{john}]$ before $\lambda x.\text{said}(x,\text{brilliant}(\text{john}))[\text{bill}]$
 $\lambda x.\text{said}(x,\text{brilliant}(x))[\text{john}]$ before $\lambda x.\text{said}(x,\text{brilliant}(x))[\text{bill}]$
 ii. $\lambda x.\text{likes}(x,\text{flying}(x,\text{planes}))[\text{john}]$ because $\lambda x.\text{likes}(x,\text{flying}(x,\text{planes}))[\text{bill}]$
 $\lambda x.\text{likes}(x,\text{flying-planes}))[\text{john}]$ because $\lambda x.\text{likes}(x,\text{flying-planes}))[\text{bill}]$
- b. i. $\text{said}(\text{john},\text{brilliant}(\text{john}))$ before $\text{said}(\text{bill},\text{brilliant}(\text{john}))$ (strict)
 $\text{said}(\text{john},\text{brilliant}(\text{john}))$ before $\text{said}(\text{bill},\text{brilliant}(\text{bill}))$ (sloppy)
 ii. $\text{likes}(\text{john},\text{flying}(\text{john},\text{planes}))$ because $\text{likes}(\text{bill},\text{flying}(\text{bill},\text{planes}))$
 $\text{likes}(\text{john},\text{flying-planes}))$ because $\text{likes}(\text{bill},\text{flying-planes}))$

As can be seen, this procedure generates the exact same range of interpretations for the sentences in (4) as do Sag's and Williams' analyses. The strict/sloppy ambiguity induced by the pronoun in the antecedent clause in the (i) example, however, is given a distinct explanation. As mentioned above, the pronoun itself is assumed to be interpreted in one and only one fashion, equivalent to the referential interpretation of Sag and Williams. The ambiguity in interpretations assigned to the empty VP comes from the mechanisms available for generating interpretations applied to an antecedent VP in which all ambiguities have already been resolved.⁸

⁸The mechanism outlined above for generating interpretations for VP deletion sentences faces what I believe to be an insuperable problem. As I mentioned above, ambiguity of interpretation in VP deletion sentences is predicted whenever a sentence contains two referring expressions with the same semantic interpretation, one of which is contained in the parallel portion of the antecedent sentence (i.e. in α^*) and the other of which is used to generate the predicational portion (i.e. P'). In all such instances, there will be two options for how to treat the second such expression – it can either retain its original interpretation, or it can be abstracted along with the primary occurrence in α^* . For the cases considered above, this flexibility yields the correct results. However, the analysis predicts that the interpretation of the ellipsis sentence should be independent of the manner in which the interpretation of the antecedent sentence is generated. In particular, whether the interpretation P' is generated from a pronoun or from an R-expression in the antecedent sentence should be entirely irrelevant to the range of readings they predict to be available. Thus, the two sentences given below, for example, should on their view come out as completely synonymous – each should have both a strict reading and a “sloppy” reading.

i: John's mother loves him, and Bill's mother does too.

ii: John's mother loves John, and Bill's mother does too.

What we find, however, is that only the first case, where the interpretation assigned to P' originates from a pronoun, is a sloppy reading available. DS&P could account for these facts by stipulating that aside from primary occurrences, no other occurrences of R-expressions can be abstracted. Making such a move, however, would first be highly stipulative, and second violate the spirit of the analysis. The status of an expression as a pronoun or as an R-expression is only part of the syntactic representation of that expression, and does not show up in the semantics (on their analysis). Since the interpretation assigned to P' is derived from the semantic representation of a sentence and not from some syntactic representation, this distinction is thus in principle unavailable. Making such a distinction would then be to admit defeat. For this and other reasons, I do not believe that the analysis offered by DS&P is

The analysis of DS&P is somewhat less constrained than the analysis of Williams and, to some extent, that of Sag. This is so since DS&P assume that the general procedure outlined above can be used for generating interpretations of overt pronouns as well as for empty material. Thus, the connection between “deletion” and interpretation assignment is in one sense fairly loose. However, the possibility of restricting the interpretation of an empty element is crucially dependent on the possibility of assigning to this empty element the interpretation generated from some discourse antecedent, and in this regard the connection between deletion and interpretation is quite rigid. In this respect, DS&P’s analysis is closer to Williams’ than to Sag’s.

1.2.4 Summary of the Three Analyses

To summarize, we saw that each of the above analyses can account for the core cases of interpretation restrictions in VP deletion environments. While details of the mechanisms used to account for these restrictions differ among the three analyses, they do share some things in common. In all three analyses, the restrictions on interpretation are tied directly to the mechanisms for interpreting empty VPs. For Sag, the connection is simply stipulated, while for Williams and DS&P it is an integral part of the analysis that such a connection exists. The looseness of the connection in Sag’s theory shows up in his having to posit an overt identity restriction on deletion, while for Williams and DS&P, identity of interpretation follows from deriving the interpretation of the deleted material directly from (a phrase containing) the antecedent.

1.3 VP Deaccenting

The above analyses account for a large range of facts, including the facts (i) that pronominal interpretation in VP deletion contexts gives rise to a restricted range of ambiguities, and (ii) that ambiguity in general does not multiply in VP deletion contexts. Sag ac-

tenable, nor do I see a simple way of fixing it up so as to retain the essence of the analysis and overcome these problems. Since I am not interested either in defending the analysis or in modifying it, I will not make further comments on its adequacy or inadequacy except with respect to the problem of accounting for restrictions on deaccenting.

completes this by only allowing a VP to be deleted when that VP has a logical form which is identical up to the point of alphabetic variance with the logical form of some antecedent VP in the preceding discourse. Williams' accounts for these facts by copying an antecedent VP onto an empty VP, stipulating that this copy operation can only apply after all ambiguities in the antecedent have been resolved. Strict and sloppy readings for pronouns fall out from the assumption that there is an ambiguity inherent in pronominal interpretation, pronouns in general being capable of receiving either a bound variable interpretation or a referential interpretation. DS&P account for these facts in a manner similar to that of Williams in that they resolve all ambiguities in the antecedent prior to deriving the interpretation assigned to an empty VP. They differ, however, in interpreting pronouns unambiguously, deriving the restrictions on pronominal interpretation by allowing for some flexibility in the "reconstructed" predicates which can be derived from an antecedent sentence which contains a pronoun. All three analyses assume that the facts in question should be handled by the mechanism responsible for interpreting the empty VP. It is somewhat surprising under these analyses, then, that these same restrictions show up identically in cases in which a VP is deaccented but not deleted.

To illustrate this fact, compare the interpretations available for the sentences in (4) above with those available for the sentences in (16) below, which differ from (4) only in that the VPs which were deleted in (4) are overt but deaccented in (16).⁹

- (16) a. John said he is brilliant before Bill *said he is brilliant*.
 b. John likes flying planes because Bill *likes flying planes*.

Here we find that the interpretational possibilities for the pronoun *he* in the subordinate clause in (16a) are exactly identical to those for the corresponding pronoun in the deleted VP in (4a). Similarly, just as (4b) was only two ways ambiguous, we find that the example in (16b) here with deaccenting instead of deletion is likewise only two ways ambiguous. These facts pose a serious problem for each of the three theories of VP deletion outlined above. For Sag, the constraints on interpretation in VP deletion contexts were derived

⁹Here and elsewhere, I represent deaccenting by printing deaccented constituents in *small italics*. As mentioned earlier, deaccented constituents are pronounced without any phonological accent, which in the normal case will result in these constituents being spoken with a steady low tone with little or no intonational contour.

by placing restrictions on when it is possible to *delete* a VP. The constraint makes no mention of when it is possible to *deaccent* a VP. For Williams, matters are even worse. In order for Williams' account of the facts of VP deletion to go through, it is necessary for there to be an empty VP onto which the antecedent can be copied, but in neither of the deaccenting examples in (16) is there any such empty VP. DS&P are similarly in hot water, lacking an empty VP to assign some interpretation to. Thus, none of the accounts offered for the restrictions on interpretation in (4) can account directly for the similar restrictions in (16) as these analyses now stand.

The obvious first attempt at a solution to this problem would be to argue that conditions on VP deaccenting and conditions on VP deletion are identical, i.e. that the two phenomena differ solely in their phonological aspect. For Sag, this would simply require extending the analysis of VP deletion directly to deaccenting by claiming that the constraint which is applicable in the two cases is identical. For Williams, a more drastic move would be called for but again the problem could be skirted by allowing copying to overwrite deaccented lexical items or variables if they are identical to those being copied in. Such a move would require importing an additional identity constraint into the theory, but at least it could be made to work for the examples under consideration so far. Finally, for DS&P one might allow the mechanisms of ellipsis resolution to assign interpretations not only to empty elements and pronouns, but to deaccented material as well, adding again some kind of identity constraint to prevent massive over-application of the mechanism. No such solution could be maintained for the following examples, however. In these examples, we find that it is possible to deaccent a phrase when deletion of that same phrase would be impossible.

- (17) a. John said he is brilliant before Bill *said he is a smart guy*.
b. John likes soaring gliders because Bill *likes flying aircraft*.

Here, the VP in the subordinate clause has been deaccented, licensed (as I will argue below) by the VP in the matrix clause. The only difference between these sentences and the sentences in (16) is that in (16) the superordinate and subordinate predicates are identical whereas in (17) they are distinct. Crucially, all of the restrictions on pronominal interpretation found in the previous examples carry over without exception to the

sentence in (17a), and likewise with the restrictions on ambiguity resolution for the sentence in (17b). The simple-minded extensions of Sag, Williams and DS&P floated for consideration above, however, would be unable to account for the possibility of deaccenting in these examples for the simple reason that the antecedent VP and the deaccented VP are not identical.

A last attempt might be made to save the simple-minded extension strategy by arguing that the notion of identity needs to be replaced by some looser notion of similarity. However, as long as deletion and deaccenting are both taken to be subject to the same constraints, no such loosening of the identity restriction on deletion/deaccenting can account for the full range of facts in need of explanation. In particular, any such analysis would inevitably lead to the prediction that the original VP deletion sentences in (4a) above share an interpretation with the VP deaccenting sentences in (17), which is patently not the case. To see why, consider each of the three theories in turn. For Sag, who treats VP deletion as a deletion process, the problem is this: if deletion and deaccenting are both subject to the same restrictions, and if these restrictions allow for the phrase *said he is a smart guy* to be deaccented in (17a), then this phrase should be allowed to be deleted as well. Since deletion itself does not change the interpretation assigned to a VP, we would then predict that a possible interpretation of the VP deletion sentence in (4a) should be the interpretation naturally assigned to the sentence in (17a). That is, VP deletion sentences would be predicted to be wildly ambiguous in ways in which they clearly are not. For Williams, the problem with extending the VP deletion analysis directly to deaccenting is in a sense the opposite. Recall that Williams relies on a copying mechanism for restricting the interpretation of empty VPs. If we attempt to account for those same restrictions in deaccenting cases by allowing the copying operation to apply here as well constrained by some notion of similarity, we would once again predict that VP deletion sentences like that in (4a) should be interpreted identically to any sentence which differs from it solely in having a deaccented VP instead of a null VP. In particular, we would expect the sentence in (17a) to be interpreted identically to (4a). Unlike Sag, however, who would suffer from a massive overgeneration of interpretations for VP deletion sentences, Williams' problem would be the opposite – for Williams, all

sentences containing a deaccented VP with the same antecedent should be interpreted exactly as we naturally interpret the corresponding VP deletion sentence. Again this result is not consistent with the facts. For DS&P, the problems are essentially identical to what they are for Williams. By trying to account for the restrictions on interpretation in the deaccenting case by applying the mechanism of VP deletion resolution directly to a deaccented VP, the prediction that a deaccented VP should be interpreted exactly like a deleted VP becomes unavoidable. In short, a simple-minded extension of the analyses which treated VP deletion and VP deaccenting identically would run afoul for the simple reason that the possibilities for interpretation of a deleted VP are more restricted than are those for a deaccented VP.

A second obvious solution to try would be to maintain that the essence of at least one of the three analyses under consideration is correct, and argue that the constraints which apply to VP deaccenting are a subset or subpart of the constraints that apply to VP deletion. For Williams and DS&P, it is not at all clear that any extension along these lines is possible without forcing essential changes to be made to the theories themselves. Under their analyses, the constraints on interpretation which exist in ellipsis cases are inherent to the mechanism by which an interpretation is assigned to the elided VP from some antecedent, making the identity between interpretation of the antecedent VP and interpretation of the elided VP necessary. For Sag, on the other hand, such an extension is in principle possible provided that it is possible to maintain the identity constraint he gives in (6) for VP deletion while constructing a suitable constraint for deaccenting which is implied by this constraint. To see what such a solution would have to look like, consider this constraint once again, repeated here.

- (6) (= Sag's (12))
 With respect to a sentence S, [VP deletion] can delete any VP in S whose representation at the level of logical form is a λ -expression that is an alphabetic variant of another λ -expression present in the logical form of S or in the logical form of some other sentence S', which precedes S in discourse.

The type of analysis we are envisioning should be derivable from (6) by either eliminating conditions from this constraint or by making some of these conditions less restrictive.

There is no motivation, however, for assuming that the conditions on the antecedent phrase are any different for the deletion cases and the deaccenting cases, nor is it plausible to assume that the two types of cases differ in whether or not the VPs are subject to λ -abstraction at logical form. This leaves only the condition of alphabetic variance to play around with. Eliminating this condition is not an option since without it – or some variant of it – there will be no explanation at all of the restrictions on interpretation which apply to deaccented VPs. This type of solution will only be possible, then, if the notion of alphabetic variance itself can be weakened in an appropriate manner.

To see whether this is possible, consider once again the definition of alphabetic variance given in (7), repeated below.

- (7) Formulae ϕ and ϕ' are **alphabetic variants** if there are formulae $\phi_0, \phi_1 \dots \phi_n$ such that ϕ_0 is ϕ , ϕ_n is ϕ' , and, for each i from 1 to n , ϕ_i is formed from ϕ_{i-1} by replacing some constituent λ -expression $[\lambda\alpha_i\psi_i]$ by an immediate alphabetic variant $[\lambda\alpha'_i\psi'_i]$ thereof.
- (8) $[\lambda\alpha\psi]$ and $[\lambda\alpha'\psi']$ are **immediate alphabetic variants** if ψ and ψ' are alike except that ψ' contains free occurrences of α' at all and only those places where ψ contains free occurrences of α .

Recall that Sag needs this definition in the form it is in to account for the VP deletion facts. Hence we cannot alter the notion of alphabetic variance itself. What we can do, however, is formulate a derivative notion – call it *containment variance* – which has the property that if ϕ is an alphabetic variant of ϕ' , then ϕ is also a containment variant of ϕ' . As an approximation to this condition, consider the following definition.

- (18) Formulae ϕ is a **containment variant** of ϕ' if there are formulae $\phi_0, \phi_1 \dots \phi_n$ such that ϕ_0 is ϕ , ϕ_n is ϕ' , and, for each i from 1 to n , ϕ_i is formed from ϕ_{i-1} by replacing some constituent λ -expression $[\lambda\alpha_i\psi_i]$ by an immediate containment variant $[\lambda\alpha'_i\psi'_i]$ thereof.
- (19) $[\lambda\alpha\psi]$ is an **immediate containment variant** of $[\lambda\alpha'\psi']$ if ψ and ψ' are similar except that ψ' contains free occurrences of α' at all and only corresponding places where ψ contains free occurrences of α , and the interpretation of $[\lambda\alpha'\psi']$ is contained in the interpretation of $[\lambda\alpha\psi]$.

Of course, the notion of *semantic interpretation* in question here would have to be more than merely an extensional notion, or any true sentence would be predicted to be able to license the deaccenting of any other true sentence, which clearly is not the case. Furthermore, the notion of two formulae being *similar* would have to be spelled out in such a way that the position of an expression in φ could correspond to the position of some position in ψ without φ and ψ having to be syntactically identical. I will assume for the sake of argument that this problem can be overcome. If so, then given a sufficiently articulated notion of semantic interpretation, the above definition of containment variance could be used in a constraint similar to that given in (6) for licensing VP deletion. An illustration of what such a constraint would look like is given in (20) below.

- (20) With respect to a sentence S, deaccenting can apply to any phrase in S whose representation at the level of logical form is containment variant of another expression present in the logical form of S or in the logical form of some other sentence S', which precedes S in discourse.

There are two problems with such an approach. The first is that the notion of *containment* required cannot be defined in purely syntactic terms, i.e. in terms which make reference only to the formal properties of the abstract symbols involved. As we will see in chapter 2, no purely syntactic analysis can account for the deaccenting of the second VP in sentences like the following (modelled after sentences considered in Lakoff (1972)).

- (21) John called Mary a republican, and then BILL *insulted Mary*.

The implication which is felt to hold between *calling Mary a republican* and *insulting Mary* in this example clearly does not follow directly from the meanings of the terms involved. It rather requires some degree of reasoning to establish the connection, reasoning which obligatorily makes use of non-linguistic knowledge. The reasoning process is of course fairly straightforward: John called Mary a republican; being a republican is a bad thing; therefore John called Mary something bad; to call someone something bad is to insult them; therefore John insulted Mary.¹⁰ However, as I will argue in chapter 2, it is

¹⁰The premises may not all be universally held to be true, but the reasoning process is fairly obvious none the less.

necessary to appeal to this implication relation in order to explain the acceptability of the deaccenting in (21). Since syntactic processes operate independently of reasoning processes, the fact that reasoning is required to explain the felicity of this example indicates that any analysis which simply compares the syntactic representation of the antecedent sentence with that of the deaccented sentence in determining the felicity of a discourse fragment such as (21) cannot be correct. The second objection to the above approach is of a theoretical nature. The accounts given for the two phenomena are clearly similar, but the similarity is not a principled one. That is, even if the account could be made to work, it would answer the question of when deletion and deaccenting are possible (to the extent to which it gets the facts right, of course), and it would also answer the question of what constraints on interpretation obtain in the two cases, but it would leave us without an explanation for why these constraints are virtually identical.

1.3.1 Further Evidence

The arguments I have just given in the previous section all indicate that the general approaches taken to VP deletion over the past many years have been misguided. If the parallelism noted between restrictions on interpretation in VP deletion and VP deaccenting environments hold up in the end, then the argument is quite strong. The argument is not, I repeat, that the analyses in question do not capture the facts they are intended to capture. Rather, the argument is that each of the analyses fails to capture a broader generalization. Two sets of data are intuitively subject to identical restrictions, and yet all of the analyses presented can only account for one of the two sets in a principled fashion.

I have until now only considered in detail the interpretational possibilities of a limited number of sentences. For these sentences, the evidence was clear that a parallelism truly does exist between restrictions on interpretation in VP deletion and VP deaccenting environments. In this section, I will examine a wider range of cases of VP deletion and deaccenting, and will show that the parallelism holds in each case. This will offer a strong piece of support to the argument against previous analyses of VP deletion made in the previous section.

As mentioned in the introduction to this chapter, any account of VP Deletion has to take into account the fact that sentences like those in (1) (repeated here) as well as sentences like those in (2) (also repeated here) are only two ways ambiguous.

- (1) a. Betsy divulged when Bill promised to call me, and Sandy did too.
b. The chickens are ready to eat, and the children are too.

- (2) a. Betsy divulged when Bill promised to call me because/before Sandy did.
b. The chickens were ready to eat when the children were.

While the antecedent VP in each of these examples is ambiguous, whatever interpretation is assigned to that VP must also be assigned to the deleted VP. Similar observations have been made elsewhere in the literature regarding a wide range of ambiguities. Lasnik (1972), for example, considers (22a) which shows this same property in a *do so* construction, while Chomsky and Lasnik (1992) make the same point (citing the earlier work of Lasnik (1972) and Lakoff (19??)) with the sentence in (22b). Each of these sentences parallels their VP deletion counterparts in (23).

- (22) a. John wants to catch a fish and so does Bill.
b. John said that he was looking for a cat, and so did Bill.

- (23) a. John wants to catch a fish and Bill does too.
b. John wanted to catch a fish before Bill did.
c. John said that he was looking for a cat, and Bill did too.
d. John said that he was looking for a cat because Bill did.

In all of these examples, we find that the interpretational parallelism between the deleted VP and its antecedent which motivated previous analyses of VP deletion hold identically in cases in which the dependent VP is deaccented but not deleted. For example, each of the sentences below exhibits the same two way ambiguity as its counterpart(s) in (1),

(2) and (23) above.¹¹

- (24) a. Betsy divulged when Bill promised to call me, and Sandy *divulged when Bill promised to call me too*.
b. Betsy divulged when Bill promised to call me before Sandy *divulged when Bill promised to call me*.
c. The chickens are ready to eat, and the children *are ready to eat too*.
d. The chickens were ready to eat when the children *were ready to eat*.
e. John wants to catch a fish, and Bill *wants to catch a fish too*.
f. John wanted to catch a fish before Bill *wanted to catch a fish*.

Lasnik attributed the parallelism between (22a) and (24e) to properties of conjunction structures, since the examples he was considering all contained conjunction. However, consideration of the full range of examples given here clearly indicates that this characterization of the source of the parallelism is incomplete at best. Chomsky and Lasnik (1992) argue that the parallelism derives from constraints on deaccenting, and that VP deletion is no more than an extreme case of deaccenting. However, just as we found that deaccenting was possible even when the two VPs were not identical in the examples considered in detail in the previous section, here again we find that identity is not required for deaccenting. Once again, despite the lack of identity between the VPs, the same restrictions on interpretation apply to the deaccented phrase here as applied above. These facts again support the first half of Chomsky and Lasnik's analysis according to which parallelism of interpretation derives from constraints on deaccenting. They would appear to be inconsistent with the second half of their analysis however, which reduces VP deletion directly to deaccenting.

¹¹I find the examples paralleling (22a) and (23a,b) in (24e,f) less convincing than the other examples under consideration. If the indefinite expression *a fish* is given a non-specific interpretation in the antecedent VP, then the only possible interpretation available for the corresponding deleted expression is a non-specific interpretation as well. However, if given a specific interpretation in the antecedent VP, I find both a specific and a non-specific reading available for the corresponding deleted expression, though the former is perhaps easier to obtain than the latter. The judgment is unfortunately subtle, so I hesitate to hang much on it, though I do believe the additional non-parallel reading is present. I do not find this additional reading to be problematic, since if it does exist it can be explained as an instance of the types of interpretational mismatch illustrated in (25) below. Since the judgment is so delicate, however, I will ignore this possibility here and throughout this dissertation.

- (25) a. Betsy divulged when Bill promised to telephone me, and Sandy *said when Bill promised to get in touch with me too.*
 b. Betsy divulged when Bill promised to call me before Sandy *said when Bill promised to get in touch with me.*
 c. The chickens are prepared to eat, and the children *are ready to consume too.*
 d. The chickens were prepared to eat when the children *were ready to consume.*
 e. John wants to spear a marlin, and Bill *wants to catch a fish too.*
 f. John wanted to spear a marlin before Bill *wanted to catch a fish.*

Like their counterparts in (24), each sentence here is only two ways ambiguous (although see previous footnote). It appears, then, that the arguments made in the previous section generalize to quite a wide range of data, offering firm support for the conclusions reached there.

The facts just considered indicate that the explanation for restrictions on interpretation in VP deletion contexts should be identical to that given for similar restrictions on interpretation in deaccenting contexts. There are two principled ways in which these explanations can fall together. One can either show that each of the classes of interpretational restrictions is based on a single underlying notion and that it is this underlying notion which is responsible for the similarities between the two sets of data, or one can show that the explanation for one of the sets of data reduces to that for the other set. I have argued that it is impossible to reduce the deaccenting cases directly to the deletion cases since there are cases in which deaccenting of a VP is possible but in which deletion of that same VP is not possible. If a reduction is to be possible, then, it will have to be a reduction of the explanation for the VP deletion cases to that for the deaccenting cases. In chapter 3 I show how such a reduction is possible. Before getting to that point, however, it is necessary to first develop an analysis of the restrictions which apply in deaccenting environments. It is this task that I turn to now.

Chapter 2

Deaccenting and Presupposition

2.1 Introduction

We saw in chapter 1 that ambiguity resolution in VP deletion contexts is largely paralleled in corresponding deaccenting cases. We concluded from this observation that a complete theory of ambiguity resolution in such contexts has to start from an account of the deaccenting cases, with the VP deletion cases being handled as a sub-case of deaccenting. In this chapter, I will look more in detail at the process of deaccenting. There are two main questions I will be addressing: (i) is deaccenting identical to lack of focus, or are focus and deaccenting distinct processes; and (ii) what are the conditions under which a given element or collection of elements in a sentence can be deaccented? The standard assumption in the literature regarding (i), implicit or explicit, is that deaccenting is identical to lack of focus, and hence I will approach the problem of accounting for constraints on deaccenting from this perspective.

The relation between focus and discourse context has been widely studied. For our present purposes, I take as a starting point the analysis laid out in Chomsky (1971). There it was proposed that for a given sentence S which contains a focused constituent F ($S = \dots F \dots$), the (focus-related) presupposition of S is the existential closure of the expression generated by replacing F with a variable, i.e. $\exists x[\dots x \dots]$. A sentence like (26) under this theory thus presupposes (27) on the interpretation in which *the Yankees* is taken to be focus.

(26) The Red Sox played the YANKEES

(27) $\exists x$ [The Red Sox played x]

This basic analysis of focus and of focus-related presupposition forms the heart of most subsequent analyses of the phenomenon, including those of Williams (1980), von Stechow (1981), Rochemont (1986), Jacobs (1989), and Krifka (1990,1991) among others, and I will accordingly refer to it as the standard analysis.

While it is rarely made explicit what role focus-related presuppositions play in determining the felicity of a given sentence, it is generally assumed that focus-related presupposition is an instance of a broader class of presuppositions, and that consequently the analysis of focus-related presupposition will fit into such a broader theory.¹ The only major challenges to this analysis that I am aware of are the analyses of Jackendoff (1972), Rooth (1985) and Rochemont (1986). For these authors, the contribution of focus-structure to the acceptability of a sentence does not lie in what is presupposed to be true but rather in (roughly) what is taken to be under discussion. One of the major goals of this chapter will be to argue in support of these latter analyses that what has been identified as the focus-related presupposition of a sentence does not in fact fit into standard models of presupposition. While the analysis I develop is more in line with these three non-standard analyses than with the standard analysis, however, I argue that even these analyses are too restrictive in the role they assign to focused constituents.

I take Karttunen (1974) to be representative of standard analyses of the role that presupposition plays in determining the felicity of a given sentence. According to Karttunen, the presuppositions of a sentence relate that sentence to a context. The particular

¹The classical notion of presupposition is one which applies only to declarative sentences. Since focus and deaccenting play the same role in questions as in declarative sentences, clearly the classical notion cannot be used directly to account for the interaction between focus-related presuppositions and contexts. However, Higginbotham (1991) shows how the classical notion of presupposition can be extended to questions, making it possible in principle to account for focus-related presuppositions in terms of the classical notion of presupposition. The argument of the present section is intended to show that even under such an extension, focus-related presupposition cannot be reduced to classical presupposition. Since extending the analysis of focus-related presuppositions and of classical presuppositions to questions does not shed any extra light on the problem at hand, I will not discuss the focus-related presuppositions of questions in any detail.

analysis that Karttunen argues for is that the presuppositions of a sentence must be *satisfied* by the context of utterance in which the sentence occurs, with satisfaction defined as follows.

- (28) Context *C* *satisfies-the-presuppositions-of A* just in case *C* entails all of the basic² presuppositions of *A*.

Context for Karttunen is defined as “a set of logical forms that describe the set of background assumptions, that is, whatever the speaker chooses to regard as being shared by him and his intended audience.” Like Karttunen’s presuppositions, I take focus-related presupposition to play a role in determining the felicity of a sentence in a given context. I will argue below, however, that the satisfaction conditions for focus-related presupposition are distinct from those for standard presuppositions. In a nutshell, I argue that *entailment* plays no role in determining when a focus-related presupposition is satisfied. Rather, the operative notion for satisfaction of a focus-related presupposition is *instantiation*, a notion more directly related to *topic* than to *presupposition*. I will make these notions more precise below.

In dealing with questions of focus-related presupposition, two aspects of the problem must be kept in mind – the semantic aspect, and the phonological aspect. It is common practice to distinguish elements which are phonologically accented from those which are not by the use of CAPITALS to indicate accent, and I will make use of this convention here as well. Such elements I take to be uniformly included in a semantic focus of a sentence. It is also common to assume that some of the elements of a sentence which do not

²Karttunen’s relativization of satisfaction to *basic* presuppositions of a sentence derives from the perspective he takes on the problem of presupposition inheritance. Instead of determining the presuppositions of a complex sentence from the presuppositions of its parts, Karttunen advocates an approach to presupposition satisfaction by which the presuppositions of a complex sentence are satisfied only if the presuppositions of its parts are satisfied in their local context. The basic idea is that in a complex sentence consisting of two conjuncts *A* and *B* (in that order), the local context for *B* consists of the local context for *A* augmented by *A* itself. The presuppositions of the complex sentence as a whole will then be satisfied only if the presuppositions of *A* are satisfied by the context of utterance, and those of *B* are satisfied by the context of utterance augmented by *A*. Basic presuppositions, then, will be those presuppositions associated with the non-complex propositions which make up a (possibly complex) sentence. Most of the sentences I will be concerned with in this chapter will be non-complex, so that the complexities of presupposition projection can be largely ignored. I adopt Karttunen’s treatment of presupposition satisfaction none the less for the conceptual simplicity it makes possible in relating sentential properties to contexts.

receive primary accent can still be included in a semantic focus together with an accented element, though this distinction is rarely made orthographically. Here, I depart from tradition by using *small italics* to indicate elements of a sentence specifically intended to be excluded from the semantic focus of a sentence. It should be emphasized that this convention only makes explicit what other analyses of focus assume implicitly, and does not constitute a substantive proposal about the mechanisms of focus-assignment. Elements presumed to be contained within a semantic focus but not phonologically prominent I write in normal type. Using the sentence in (23) as illustration, this convention can be used to indicate NP focus as in (29a), VP focus as in (29b), and S focus as in (29c).

- (29) a. *The Red Sox* played the YANKEES.
b. *The Red Sox* played the YANKEES.
c. The Red Sox played the YANKEES.

This orthographic convention is convenient in that it is compatible with several distinct theories regarding the exact mechanisms of focus assignment, and makes it possible to specify in a more precise fashion what assumptions are being made with respect to the focus structure of a sentence. Implicit in my adoption of this convention is the assumption that semantic focus assignment is completely disambiguated at some level of representation. In this chapter, I will assume that differences in semantic focus are represented at least by the level of LF. In section 2.4, I will argue that in order to relate phonological accent and semantic focus, semantic focus must be represented by the level of S-structure as well, or rather, a unique semantic focus must be determined by the S-structure representation of focus.

2.2 Focus-Related Presupposition as Topic

2.2.1 The Standard Analysis

As mentioned earlier, most if not all current analyses of focus-related presupposition are based upon Chomsky's proposal which derives a focus-related presupposition by replacing the foci of a sentence with variables which get existentially quantified. To facilitate

discussion, I formalize this proposal below, borrowing somewhat from Williams (1980).

- (30) Given a sentence S and its foci F_1, \dots, F_n , replace each F_i in S by a variable x_i . Call the resulting structure P . The presupposition of S is given by existentially closing P , i.e. $\exists x_1, \dots, x_n[P]$.

Fitting this definition of presupposition in with Karttunen's analysis relating presuppositions to contexts gives the following:

- (31) Given a sentence S and an associated structure P as in (30), S can be felicitously uttered in a context C just in case C entails $\exists x_1, \dots, x_n, [P]$.

I refer to this analysis as the *standard analysis*.

We are now in a position to examine this analysis. To start with, consider the sentence *Mary saw John*, given below with two distinct pronunciations.

- (32) a. MARY *saw* JOHN.
b. Mary SAW *John*.

I assume for the sake of discussion that the focused elements are *Mary* and *John* in (a), and *saw* in (b) (as indicated orthographically), and that the remaining elements are excluded from semantic focus. According to (30), the focus-related presuppositions associated with these sentences are those given in (33).

- (33) a. $\exists xy[saw(x, y)]$
b. $\exists R[R(mary, john)]$

The motivation for pairing the sentences in (32) with the focus-related presuppositions in (33) is presumably to account for the conditions under which utterance of the sentences in (32) will be felicitous. If we treat focus-related presupposition together with other types of presupposition along the lines suggested in Karttunen, then the prediction we are led to is that the sentences in (32) should be felicitous in contexts which entail the respective propositions in (33). In many cases, this prediction is borne out. When a proposition added recently to the context obviously entails the relevant proposition in (33), the corresponding sentence in (32) is felicitous, as illustrated below.

- (34) a. BILL saw SUE. Then MARY *saw* JOHN.
b. JOHN called out to MARY. Then, *Mary* SAW *John*.

Problems arise, however, when we start to look at the negative cases, i.e. at cases in which the sentences in (32) should be infelicitous. This should occur whenever the sentences occur in a context which does not entail the proposed presuppositions. But when will this situation obtain? The clear intention of the standard theory is that it should obtain in contexts like the following (# indicates infelicity).

- (35) a. JOHN called out to MARY. Then, #MARY *saw* JOHN.
b. BILL called out to SUE. Then, #*Mary* SAW *John*.

In these examples, the first sentence does not entail the focus-related presupposition of the second. If we assume the standard possible worlds definition of entailment, then a proposition *p* will entail a proposition *q* if and only if the set of worlds in which *p* is true is a subset of the set of worlds in which *q* is true. Applying the definition here, it can be seen straightforwardly that the first sentence of the examples in (35) will not entail the second sentence since there are possible worlds in which the first sentence is true and in which the second sentence is false. In (35a), one such world would be a world in which no sentient life forms have eyes, and in (35b), one such world would be a world in which either *Mary* or *John* (or both) does not exist.

If contexts were restricted to propositions which have been uttered in a discourse, no more would have to be said to account for the infelicity of the discourse fragments in (35). However, the notion of context which Karttunen adopts is not restricted in this fashion, contexts containing in addition a large number of propositions which can be viewed as assumed common ground between a speaker and a hearer. If included in this common ground is any proposition entailing that someone has once upon a time seen someone else, then the second sentence of (35a) would be predicted to be felicitous, since then the set of worlds denoted by the context would be a subset of the set of worlds denoted by the presupposition in (33a). Likewise, if it is part of the common ground that *John* and *Mary* both exist, then the second sentence of (35b) should be felicitous, since again every world consistent with the context would also be consistent

with the focus-related presupposition in (33b). In many instances, however, it would be unproblematic to include such propositions in the common ground and yet the discourse contexts would be no more felicitous than they would be if such propositions were not included in the common ground. Suppose for instance that the discourse fragment in (35) occurred as the beginning of a conversation between two members of a gang, four of whose members were *Bill, Sue, Mary* and *John*. It will be part of the common ground between these two speakers that the four other gang members in question exist, and hence the context should be able to contain a proposition indicating this state of affairs. However, such a context would then entail the focus-related presupposition of (32b) given in (33b), and hence (32b) would be predicted to be felicitous in any discourse between these two speakers, in particular in a discourse such as that given in (35b). Even in such a setting, however, this discourse fragment is infelicitous – mere common ground cannot be what satisfies the focus-related presupposition of a sentence, and so positing the focus-related presuppositions in (33) for the sentences in (32) will not suffice to account for the infelicity of the discourse fragments in (35) within Karttunen’s assumptions regarding presupposition satisfaction.

2.2.2 Revisions to the Standard Analysis

The first way in which the focus-related presuppositions given in (33) might be defended in light of the above discussion is to alter the notion of context in such a way that the only propositions contained in a context are those which can be taken to be somehow “active” in the minds of the discourse participants. This notion differs from that assumed by Karttunen in that propositions which undeniably qualify as common ground between two participants in a conversation will not thereby qualify as being active. Such propositions as *The sky is blue, Africa is bigger than New Zealand* etc. will in general be part of the common ground between speakers, but are not likely to be active except in conversations about the sky, blueness, geography and the like. Since this notion of context differs from that assumed by Karttunen, let me refer to contexts viewed in this light as *active contexts*. The objections raised in the previous paragraph would then become irrelevant on the assumption that the only propositions contained in the active context at the

point at which the second sentences in (35) are processed are the first sentences of those examples. However, this modification can be seen to be insufficient by consideration of the slightly more complex sentence given in (36a) below.

- (36) a. *John BELIEVES Mary's alive.*
b. $\exists R[R(\textit{john}, \textit{alive}(\textit{mary}))]$

According to the standard theory, the focus-related presupposition for the sentence in (36a) is that given in (36b). By the modified analysis above, then, the sentence in (36a) should be felicitous whenever the active context entails the presupposition in (36b). The problem with this analysis, however, is that any active context which entails the existence of both *John* and *Mary* and in which the predicate *is alive* is defined is a context which will entail (36b), since every world in which these conditions are met will be a world in which either John thinks Mary is alive or in which it is not the case that John thinks Mary is alive. Thus, in a context like that given below, the sentence in (36a) is expected to be felicitous since the active context entails the focus-related presupposition in (36b). This prediction is clearly not borne out.

- (37) *Mary doesn't know if John's alive. (However,) #John BELIEVES Mary's alive.*

This example shows that if we wish to continue on the assumption that focus-related presuppositions are what the standard analysis says they are, the role that such presuppositions play in relating a sentence to a context cannot be that assumed for other instances of presupposition. In particular, the relation which is required to hold between a context and the presupposition of a sentence which occurs in that context cannot be entailment.

When considering an example like that in (37), it is fairly clear intuitively what has gone wrong. The second sentence indicates (at least) that Mary's being alive is under discussion, and yet the context of utterance for this sentence contains no mention of her being (or not being) alive. To account for these intuitions and subsequently explain the infelicity of (36a) in (37), I propose that the focus-related presupposition generated by the standard analysis be treated (roughly) as a *topic* rather than as a presupposition.

The basic idea I would like to pursue is that the focus structure of a sentence indicates what the utterer of the sentence takes to be under discussion, and not what the utterer takes to be true.

2.2.3 Toward a Theory of Focus-Related Topic

If the main role of what I have been calling focus-related presupposition is to indicate the topic of discussion rather than a presupposition, then there are some obvious changes that will have to be made in the analysis of what the focus-related presupposition of a sentence is. If we were to simply rename the focus-related presuppositions of the standard theory as focus-related topics and leave the form of these entities unchanged, we would be left with an analysis which claims that all such topics are existential statements. The focus-related topic of (32a) would then be that someone saw someone, and that of (32b) that there is some relation which holds between *John* and *Mary*. Until we specify the role that focus-related topics are to play in relating sentences to contexts, this treatment of topics cannot be supported or refuted. However, it would certainly be unintuitive to claim that this is an accurate representation of what is under discussion in the examples in question. More appropriate would be to say that in the first case, what is under discussion is pairs of individuals one of whom saw the other, or perhaps the seeing relation itself, while in the second case what is under discussion is (properties which hold between) *John* and *Mary*. To reflect these intuitions, let us revise the standard theory as follows:

- (38) Given a sentence S and its foci F_1, \dots, F_n , the *focus-related topic* of S is derived by replacing each F_i in the LF representation of S by a variable x_i .

Notice that the above definition identifies a focus-related topic as a syntactic representation possibly containing free variables. Since the role that focus-related topics is to play in determining the felicity of a given discourse fragment does not require that focus-related topics be interpretable, allowing the focus-related topic of a sentence to contain free variables is not problematic. Given the above revision in the characterization of focus-related topics as well as the envisioned role that focus-related topics are to play in relating a sentence to a context, the felicity conditions for utterance of a sentence in a

context will also have to be revised. I propose the following as the general form such a condition should take, which I refer to hereafter as the felicity condition on focus-related topics.

- (39) A sentence S is felicitous in an active context C only if³ C *instantiates* the focus-related topic of S .

Instantiation is defined in (40).

- (40) A context C *instantiates* a focus-related topic α if and only if C contains some expression β such that α is identical to some potential focus-related topic of β .

γ is a **potential focus-related topic** of β if there is some expression β' which differs from β at most in its focus structure such that the focus-related topic of β' is γ .

According to this definition, a focus-related topic will be instantiated in a context whenever the context contains some logical form which in turn contains an instance of the topic (in the sense in which the logical form for the sentence *Mary is alive* contains an instance of *x is alive*). I give a more detailed discussion of instantiation in section 2.3.1 below, where I justify adopting the definition given here. Notice incidentally that the notion of context I am assuming to be relevant for the felicity conditions given in (39) is that of an active context introduced earlier.

The revised analysis given above can handle all of the cases considered so far. To illustrate, consider once again the examples in (32) and (36), repeated here as (41).

- (41) a. JOHN *saw* MARY.
b. John SAW *Mary*.
c. John BELIEVES *Mary's alive*.

³The felicity condition given here clearly cannot be strengthened to *if and only if*, since there will in general be several factors which go into determining the felicity of a given discourse fragment. Thus, in a discourse fragment like that below, the second sentence may or may not be felicitous in the context of the first depending on whether the second sentence can be interpreted as being relevant to the first.

i: No one knows whether Mary saw BILL. JOHN *saw* Bill.

What the felicity condition in (39) gives is only a necessary condition for felicity, and not a sufficient condition. What further factors go into determining relevance of one statement to another is a question which is beyond the scope of this dissertation.

According to the definition given in (38), the focus-related topics for these sentences will be the following.

- (42) a. x saw y
b. john *R* mary
c. john *R* [mary is alive]

According to the felicity conditions for focus-related topics given in (39), the sentences in (41) should be felicitous only in a context in which their corresponding focus-related topics in (42) are instantiated. Reviewing the contexts considered earlier, we can see that the analysis makes the correct predictions for all of these examples. I repeat the relevant contexts below.

- (43) a. Bill saw Sue. Then MARY *saw* JOHN.
b. John called out to Mary. Then, #MARY *saw* JOHN.
c. John called out to Mary. Then, *Mary* SAW *John*.
d. Bill called out to Sue. Then, #*Mary* SAW *John*.
e. John doesn't know if Mary's alive. However, *John* BELIEVES *Mary's alive*.
f. Mary doesn't know if John's alive. However, #*John* BELIEVES *Mary's alive*.

Consider first the example in (43a). At the point in the discourse at which (41a) occurs, the active context C consists entirely of the first sentence, *Bill saw Sue*. As mentioned, the focus-related topic of (41a) is (42a), i.e. x saw y . This focus-related topic will be instantiated in C if and only if C contains some sentence which has (42a) as a potential focus-related topic. The sole sentence contained in C satisfies this requirement. If this sentence were assigned a focus structure in which the subject *Bill* and the object *Sue* were focused and the verb *saw* was excluded from focus, then the focus-related topic of this sentence would be (42a), i.e. exactly the same as the actual focus-related topic of (41). Since (42a) qualifies as a potential focus-related topic of the sole sentence contained in C , according to the definition of instantiation given above, the focus-related topic of (41a) is instantiated in C . This sentence thus satisfies the felicity condition on focus-related topics given in (84) above, and is thus correctly predicted to be felicitous.

When we look at (43b), we find that the focus-related topic of the second sentence (= (41a)) is not instantiated in the active context consisting solely of the first sentence (=

John called out to Mary). The focus-related topic of the second sentence is again *x saw y*. There is no assignment of focus-structure to the first sentence, however, which will yield this same focus-related topic, and hence this focus-related topic is not instantiated in this context. As a consequence, this discourse fragment does not satisfy the felicity condition on focus-related topics given in (84) and is hence correctly predicted to be infelicitous. When we look at the other pairs of examples in (43), we find that the same contrast found to hold between (a) and (b) obtains in each case. The focus-related topic of the second sentence in (c) (= (42b)) is straightforwardly instantiated in the first, while in (d) it is not, and similarly for (e) and (f). If we assume that each of these discourses occurs in an otherwise neutral setting, then the felicity of (a), (c), and (e) as well as the infelicity of (b), (d), and (f) are exactly what is predicted by the above analysis. Since the felicity conditions stated in (39) are stated in terms of active context, restricting judgments to neutral contexts will amount to judging each case as if it were used discourse initially. Questions of common ground will be of no relevance for the predictions of the theory.

2.3 Problems and Extensions

The analysis just sketched goes a long way toward accounting for our intuitions about when a sentence with a given focus structure is felicitous. There are three questions which the theory must answer, however, before it can be considered adequate.

The first question is whether the definition of instantiation given in (40) above is adequate. I have only considered cases so far in which the question of whether a focus-related topic is instantiated in a given context has a fairly obvious answer, cases in which the material in the context which instantiates a focus-related topic trivially contains the focus-related topic, and cases in which the context does not contain any sentence which is even closely related to the focus-related topic of the sentence in question. There are many other instances of felicitous discourse which fall in between these extremes, where there is some relation which holds between a focus-related topic and a context but where this relation is non-trivial. A simple illustration can be seen in (44) below.

(44) Yesterday, SAM killed BILL. Today, JOHN *died*.

According to the theory outlined above, the focus-related topic for the second sentence is *x died*. As the definition of instantiation now stands, this focus-related topic is not instantiated in the active context, and yet this discourse fragment is perfectly felicitous. Examples like this would thus appear to call for a modification of the definition of instantiation given earlier. I argue, however, that modifying the definition of instantiation to account for cases like this would be a mistake – to do so would inevitably lead to a definition of instantiation which would be too imprecise to be of any theoretical value. Instead, I argue that the felicity of discourse fragments of this sort would be explained by allowing the initial context to be augmented.

This brings us to the second problem the analysis has to face, which is that of restricting context augmentation. If we allow contexts to be incremented freely, then we would no longer have an explanation of why some of the discourse fragments we have been considering are infelicitous – context incrementation could always save an otherwise infelicitous utterance. To avoid this problem, I propose that context incrementation be restricted in such a way that a proposition P can be added to a context C only if the identity of P can be reasonably determined from contextual clues. The primary way in which this can happen is if P can be calculated as a conversational implicature of a given sentence uttered in the context C , along the lines of Grice (1967/87). Whether there are other legitimate ways in which contexts can be incremented I leave as an open question, though in this dissertation I will only consider incrementation by conversational implicatures. Allowing for context incrementation will provide us with an explanation of the felicity of (44) of the following form: Sentence S with focus-related topic T occurs in an initial context C . C does not instantiate T . However, φ can be calculated as a conversational implicature of S in C and hence can be reasonably added to C , and the resulting context $C' = C + \varphi$ does instantiate T . Instantiation under this approach remains a purely syntactic process which compares two syntactic representations for identity while it becomes possible to explain the felicity of a sentence in a given discourse context even when the initial context does not instantiate the focus-related topic of the sentence in question. Felicity in these cases will be dependent on context incrementation, and so a discourse fragment which requires such context incrementation will only be as acceptable

as the incrementation itself.

The final question the theory must answer is that of how to deal with multiple focus constructions. To account for a large number of cases involving multiple foci, the analysis requires no modification. There is a class of cases, however, in which the analysis cannot adequately predict when a sentence containing multiple foci will be acceptable. This class includes examples like (45) in contexts like that given in (46).

(45) JOHN COMFORTED *Mary*.

(46) MARY was CRYING, so JOHN COMFORTED *Mary*.

According to the above analysis, the focus-related topic of the second sentence in this example is $x R \textit{mary}$. If we define instantiation in such a way that each part of this topic must correspond to some element of the same semantic type contained in the context (as might seem reasonable), then this topic should only be instantiated in contexts containing a two place relation one of whose arguments is *mary*. In the example in (46), however, this situation does not obtain, and yet the example is still acceptable. To overcome this problem requires, I will argue, a new characterization of focus-related topic.

2.3.1 Instantiation

The first problem is that of defining the notion of instantiation. I gave the following definition of instantiation immediately above based on the contexts considered in (43) above.

(40) A context C **instantiates** a focus-related topic α if and only if C contains some expression β such that α is identical to some potential focus-related topic of β .

γ is a **potential focus-related topic** of β if there is some expression β' which differs from β at most in its focus structure such that the focus-related topic of β' is γ .

While this definition suffices for those examples, the analysis as it stands is still unable to account for the acceptability of the example considered in (44) at the outset of this section. I repeat that example here.

(44) Yesterday, SAM killed BILL. Today, JOHN *died*.

Here, the focus related topic of the second sentence is *x died*. However, as we saw above, there is no potential focus-related topic of the first sentence which is identical to this expression. There are two approaches one could consider for accounting for the felicity of this discourse fragment. The first would be to modify the definition of instantiation so that a context consisting entirely of the first sentence in (44) instantiates the focus-related topic of the second. The second approach would be to maintain the definition of instantiation as given, and to find a way to augment the active context in (44) so that the augmented context instantiates the focus-related topic of the second sentence in that example.

Although it is no doubt possible to account for the felicity of cases like (44) by extending the definition of instantiation, from a conceptual point of view I believe it would be misguided to do so. The main reason for thinking so is that there is an intuitive distinction between the other cases considered previously of cases and the case of (44). In the cases considered previously, determining the acceptability or unacceptability of a sentence within a given context was a fairly mechanical affair. In a sense, there was no need to figure anything out. With examples like that in (44), on the other hand, more seems to be required. In particular, it is necessary to be able to reason that when a person is killed that person dies. For a person who failed to make this connection, the deaccenting of the second conjunct in (44) would be incomprehensible. The connection is of course obvious. However, the need to make the connection differentiates this example from previous examples, where determining whether the focus-related topic of a sentence is instantiated in a given context could be done purely mechanically, with reasoning playing no role whatsoever. In order to capture this distinction, I propose that the definition of instantiation should remain as it is given in (40) above. In order to account for the felicity of (44), then, it will be necessary to augment the context with some proposition

which contains an occurrence of the focus-related topic of the second sentence. The distinction will follow, then, if the process of augmenting a context is one which depends on a persons ability to reason.

While I believe that this approach to accounting for the felicity of (44) is on the right track, constraining the way in which a context can be augmented is a fairly intricate affair. Suppose for example that we decided to allow contexts to contain not only the logical forms of sentences actually uttered but also entailments of these sentences. Given such a modification, we could predict the felicity of the discourse fragment in (44), since the sentence *Sam killed Bill* entails *Bill died*, and there is a potential focus-related topic of this latter sentence which is identical to the focus-related topic of the second sentence in the discourse fragment. However, such a solution would be far too liberal in what it allowed, in the same way that the standard analysis couched in terms of focus-related pre-supposition was too liberal. The problem with such an account is that it is a consequence of the definition of entailment that any sentence entails a tautology, and consequently any tautology should be able to be added to the context. For example, *Sam killed Bill* entails *Either Sam is exactly six feet tall or Sam is not exactly six feet tall*. Under the proposed extension of the analysis, then, we would expect this second sentence to be able to be added to any context containing the first, and a discourse fragment like that given below would thus be expected to be felicitous, contrary to fact.

(47) Yesterday, SAM killed BILL. And now, JOHN's *exactly six feet tall*.

In fact, the same trick would allow us to license a sentence with any accenting pattern at all within any context, since it would always be possible to add to the context a trivially true proposition which contained an expression having a potential focus-related topic identical to the focus-related topic of the sentence in question. Allowing entailments to be added to a context would thus make the analysis vacuous.

A second approach one might consider would be to only allow *logical entailments* of a sentence to be added to a context. Such an approach could allow us to account for the felicity of the discourse fragment in (44) if we adopted a suitable meaning postulate which related *kill* to *die*. However, consideration of examples like the following (modeled

on similar examples from Lakoff (1972)) indicate that this is the wrong approach to take.

(48) John called Mary a republican. Then, BILL *insulted Mary*.

The problem posed by this example is that the relation which holds between calling someone a republican and insulting them is not an entailment relation, and nor would it be appropriate to add a meaning postulate to the language which licensed such an entailment relation. While *die* may well be part of the meaning of *kill*, *insult x* cannot plausibly be considered part of the meaning of *call x a republican*. If we are to allow augmentation of a context dependent upon material already contained in that context, restrictions on what can be added in this fashion cannot depend solely on the semantic meaning of what is present in the context. Rather, restricting such incrementation of contexts requires appeal to pragmatic notions.

2.3.2 Context Incrementation

We have now seen two examples associated with focus-related topics in which the focus-related topic of the example would appear not be instantiated in the local context and yet the examples are still acceptable. Both examples by hypothesis involved discourse initial utterances, the first illustrated in (44) and the second in (48), both repeated here.

(44) Yesterday, SAM killed BILL. Today, JOHN *died*.

(48) John called Mary a republican. Then, BILL *insulted Mary*.

To these, we could add the following as a third such example.

(??) I HATE *computing over telephone lines*.

If we consider this sentence uttered as the beginning of a discourse, it is not too difficult to imagine situations in which the focus pattern illustrated would be acceptable, i.e. in which the sentence would be felicitous. This example differs from the previous two,

however, in that there is by hypothesis no linguistic material already present in the active context at the time of utterance, and hence there can be no issue of redefining instantiation so as to accommodate such examples. For this example, not only *can* we appeal to context incrementation in order to explain its potential felicity, we in fact *must* do so.

I would like to suggest that these two problems are essentially identical. In neither case is the focus-related topic of the sentence in question instantiated in the local context at the point at which the sentence occurs in the discourse, in violation of the felicity condition given in (39) of section 2.2.3. However, in both cases it is possible to add a proposition to the context which does instantiate the relevant focus-related topic. Such incrementation of contexts can be seen as an extension of Lewis's (1979) notion of accommodation. For Lewis, the role of accommodation is to add a proposition to the context which will make what a speaker says true, whereas here, I am extending the notion so that it can apply to make what a speaker says felicitous as well. This extension is required in light of the view of focus-related topics proposed above as functioning to determine the felicity of an utterance, and not the truth value. With respect to the cases discussed in (48) and (49) above, we could account for the felicity of the first case if we could motivate accommodating a proposition such as *John insulted Mary*, while we could account for the felicity of the second case by accommodating a proposition such as *the speaker is computing over telephone lines*.

Before delving into the specifics of licensing accommodation, it is important to keep two aspects of the overall analysis of felicity with respect to focus-related topics separate. I argued above that felicity of a sentence in a given context is dependent on the focus-related topic of that sentence being instantiated in that context. The question of whether this situation obtains can be answered directly by inspection of the context and the focus-related topic of the sentence. That is, instantiation of a focus-related topic is defined with respect to a *fixed* context, so given an initial context, determining whether the focus-related topic of a sentence is instantiated in that context is a purely mechanical matter. By allowing for incrementation of contexts, I do not intend to alter this characterization of instantiation in the least. Incrementation of contexts will simply add some proposition(s)

to an existing context C to produce a new context C' , with this new context serving as the fixed context for the purposes of determining whether the focus-related topic of a given sentence is instantiated. Thus, allowing for context incrementation via accommodation will not affect the formal analysis developed above of the felicity conditions for a sentence uttered in a context. Problems of accommodation are formally distinct from problems of instantiation.

I claimed above that we could account for the felicity of the examples in (49) and (48) above by allowing certain propositions to be accommodated, though I have not yet specified the procedure by which such accommodation is possible. In specifying such a procedure, it is necessary to keep in mind two separate classes of cases to which accommodation can potentially apply. First, there are the cases like (49) and (48) in which the discourse fragment is perceived to be felicitous, but in which the context does not instantiate the focus-related topic of one of the sentences in the discourse. Second, there are discourse fragments like that given in (47) below, which again contain a sentence whose focus-related topic is not instantiated in the context, but which contrary to the former class of cases are perceived to be infelicitous.

(47) Yesterday, SAM killed BILL. And JOHN's *exactly six feet tall*.

If an analysis in terms of accommodation is to have any explanatory value, it must be capable of distinguishing between these two classes of cases. The most straightforward approach to this problem would be to give a formal characterization of the procedure by which a proposition can be added to a context via accommodation, a procedure which would be applicable in the former class of cases but blocked from applying in the latter class of cases. I do not believe such an approach is tenable, however, for reasons which will become evident shortly. Rather, from a formal perspective, I argue that accommodation is equally possible in each of the above cases. The distinction between the two classes of cases indicated above will not come from the formal procedure by which a proposition is accommodated, but rather from pragmatic constraints on the application of this procedure.

Formally, I propose that in order for a proposition to be added to a context via accommodation for the purposes of licensing the focus structure of a given sentence, that proposition must be calculated as a conversational implicature of the sentence in question within the context of utterance, implicatures being calculated along the lines of Grice (1967,87). As we will see, the restriction this imposes on the propositions which can be accommodated is only an indirect one. The method used for calculating such an implicature in the good cases (such as (48), (44) and (49)) can be equally applied in the bad cases (such as (47)) as well. However, calculating the relevant implicature will in general require acceptance of some reasoning procedure as valid. The difference between the good cases and the bad cases will come down to the difference in acceptability of this additional proposition. The analysis of the acceptability of a discourse fragment which requires accommodation will have the following pattern: utterance of a sentence S with focus-related topic T in context C violates the restriction on felicity given in (39) since T is not instantiated in C . Satisfaction of this restriction is a necessary condition for S to be relevant within C , and hence S violates the maxim of relevance. If I assume that the speaker is following the Cooperative Principle, then in order to make the speaker's utterance conform to the maxim of relevance, it is necessary to augment the context with some proposition ψ which does instantiate T . There will in general be an infinite number of such potential propositions. In order to determine a specific one, there must be some way of determining which such proposition to add. This will be possible in general if C contains some proposition φ and I can attribute to the speaker the belief that ψ follows from φ . If attributing such a belief to a speaker is unobjectionable, then accommodation of ψ will likewise be unobjectionable. If it is objectionable, on the other hand, then accommodation of ψ will be too, since accommodating ψ is only possible if the speaker is taken to hold some such belief.

In the case of (48), I assume that the proposition which must be accommodated in order for the discourse fragment to be felicitous is the proposition *John insulted Mary*. In order for this proposition to be accommodated, it must be calculated as a conversational implicature of the second sentence in (48) in the context of the first. A plausible means by which this implicature could be calculated would be as follows. Suppose (48) to

have been uttered by a speaker who is following the Cooperative Principle. The second sentence uttered by the speaker (i.e. S) has a focus-related topic T of the form x *insulted mary*. It is part of the conventional meaning associated with focus-related topics that in order for a sentence to be relevant within a given context, the focus-related topic of the sentence must be instantiated in the context. T is not instantiated in the context of the first sentence of the speakers utterance ($= C$). In order for S to be relevant it is necessary to add some proposition to C which does instantiate T . A speaker who utters (48) can generally be taken to know this to be so and to know that his audience knows this to be so. His audience can thus plausibly take him to intend for his listeners to add some proposition ψ to C , where ψ instantiates T , and to be capable of determining which such proposition he intends them to add. Since the only element which can be taken to be in C is the proposition *John called Mary a republican* ($= \varphi$), the speaker must assume that his audience can figure out what ψ is from this context alone. They can do this only if they assume that the speaker takes the following inference to be valid for some value of ψ : ψ follows from φ . Taking ψ to be the proposition *John insulted Mary*, this condition can be satisfied, since it is not implausible to assume that that speaker considers it insulting to call someone a republican. They can thus take the speaker to have implicated first that calling someone a republican is an insult, and second (and consequently) that John insulted Mary. This implicature is of a generalized nature – calculating the implicature does not depend on the specific speaker or on the specific circumstances of utterance. Since it is necessary to be able to calculate the second implicature (i.e. ψ) in order for (48) to obey the felicity condition given in (39), and since calculation of this second implicature requires that the speaker believe ψ ($=$ *John insulted Mary*) to follow from φ ($=$ *John called Mary a republican*), a person who utters (48) commits himself to the validity of this inference. Since it is not implausible that a speaker will consider this inference to be valid, it is relatively easy to accept (48) as a well-formed discourse fragment.

For comparison, consider the case of (47). For this example, calculation of a suitable implicature – say *Someone is exactly six feet tall* – would proceed exactly as it did above. The context C consists of the proposition *Sam killed Bill* ($= \varphi$), and the sentence S uttered in this context is the sentence *JOHN's exactly six feet tall*. The focus-related topic

T of S is by hypothesis *x is exactly six feet tall*. It is part of the conventional meaning associated with focus-related topics that in order for a sentence to be relevant within a given context, the focus-related topic of the sentence must be instantiated in the context. T is not instantiated in C , however, in violation of the maxim of relevance. In order to make S relevant in C it is necessary to add some proposition ψ to C which does instantiate T . A speaker who utters (47) can generally be taken to know this to be so and to know that his audience knows this to be so. His audience can thus plausibly take him to intend for his listeners to add some proposition ψ to C , where ψ instantiates T , and to be capable of determining which such proposition he intends them to add. Since the only element which can be taken to be in C is the proposition *Sam killed Bill* (i.e. φ), the speaker must assume that his audience can figure out what ψ is from this context alone. They can do this only if they assume that the speaker takes the following inference to be valid for some value of ψ : ψ follows from φ . Determining a specific value for ψ will be difficult, however. To see why, suppose the audience takes ψ to be the proposition *Someone is exactly six feet tall*. If this proposition is added to the context, then the resulting context will clearly instantiate T . However, we can only add this proposition to the context if we assume that the speaker takes the following inference to be valid: *someone is exactly six-feet tall* follows from *Sam killed Bill*, and this assumption is a highly implausible assumption to make. Since utterance of (47) would commit a speaker to some such assumption, it is generally perceived to be unacceptable.

The explanation just given is intended as an explanation for why discourse fragments like those in (48), (44), (49) etc. are readily considered to be acceptable while discourse fragments such as that in (47) are not. The explanation given makes the relative acceptability of the examples dependent upon an undefined (and in fact undefinable) notion of plausibility of attributing certain beliefs to a speaker. I do not take this to be a drawback to the analysis, however, for a simple reason. While under normal circumstances the acceptability of the discourse fragments under consideration are what they are indicated to be, it is possible to craft a situation in such a way that the relative acceptability of these discourse fragments is reversed. For example, if (48) were to be uttered at the democratic national convention, it would be seen as impeccable, whereas the same example would

be unacceptable (or rather completely baffling) if uttered amongst republicans who think that there is no higher praise which could be given of a person than to call that person a republican. The reason for the distinction is obvious under the analysis given above – in the former case, it is easy to imagine the speakers committing themselves to the notion that calling a person a republican is an insult, while in the latter case it is difficult to do so. Similarly, (47) would be (at least potentially) impeccable if uttered at a convention of detectives who were united by their belief that all murderers are exactly six feet tall. In each case, if the assumptions needed to calculate the relevant implicature are acceptable to the discourse participants, the discourse fragment as a whole will be acceptable, and if they are not, it will be unacceptable.

According to the analysis just sketched, a sentence with a focus-related topic should be acceptable in two types of contexts – those in which the focus-related topic is already instantiated, and those in which a hearer can augment the context with a specific proposition which he can calculate as an implicature of what the speaker has said in the context given. In the examples in (48), calculating such an implicature is relatively straightforward, and only requires attributing to the utter of the example beliefs which one might plausibly be willing to accept. Likewise, in (49) the calculation will be fairly simple provided we allow non-linguistic contextual clues to be used in calculating the relevant implicature, though I leave it to the reader to convince himself or herself that this is indeed the case. In (47), on the other hand, calculation of a suitable implicature will in general require attributing to the speaker beliefs which are implausible. Unless given independent justification for attributing such beliefs to a speaker in a specific circumstance, the implausibility of these beliefs makes the discourse fragment itself come across as unacceptable. The relative acceptability of the former examples and the unacceptability of the latter example thus receives the longed for explanation.

In addition to giving us the means to distinguish between the various examples considered in this section, the analysis just given also allows us to account for the distinction mentioned earlier between examples like (41) in contexts like (43) and examples like (48). In the former type of example, determining whether a sentence is potentially acceptable within a given context is independent of assumptions one makes about the beliefs of the

speaker. The theory predicts this since in such examples the context already contains everything needed to determine that the focus-related topic of the sentence is instantiated in the context, and determining whether a topic is instantiated in a given context is a purely mechanical affair. In the latter type of example, the focus-related topic is not instantiated in the original context, and hence the example cannot be determined to be acceptable in such a purely mechanical fashion. If it is acceptable at all, it must be because the context can be augmented with some proposition which will instantiate the focus-related topic of the sentence in question. By requiring that propositions added to the context be calculated as implicatures of a speaker's utterance within the context of utterance, since calculation of an implicature in general is dependent upon attributing certain beliefs to the speaker, the plausibility of augmenting a context in a given manner will be dependent on the plausibility of attributing the relevant beliefs to the speaker. The proposition added to the context will of course have to instantiate the focus-related topic of the sentence in question, and in this regard both cases will involve the same mechanical checking procedure to determine whether the focus-related topic is in fact instantiated. The latter cases, however, will also be dependent on the beliefs attributed to a speaker. The difference between the two types of cases thus receives a principled explanation.

2.3.3 Multiple Foci

The final problem that the analysis must face challenges the characterization of focus-related topic given in (38). As mentioned above, the problem boils down to accounting for the acceptability of sentences like (45) in contexts like that given in (46), repeated here.

(46) MARY was CRYING, so JOHN COMFORTED *Mary*.

This sentence poses a problem for the analysis on the assumption that the sentence contains two distinct foci, one containing the subject NP *John*, and the other containing the verb *comforted*. There are two ways this assumption could be cashed out consistent with analyses of focus-related presupposition in the literature. Under all analyses, the

subject will be treated as an independent focus, the only question being how to treat the focus containing the verb. One option would be to treat the focus as consisting entirely of the verb itself, hence replacing the verb alone by a variable in determining the focus-related topic of the sentence. A second option, more in line with the analyses of Chomsky (1971) and Selkirk (1984), would be to treat the entire VP as focus. Under such a treatment, the variable which replaces the VP in generating the focus-related topic for the sentence would presumably be constrained to ranging over properties which relate *Mary* to a subject. These two options would result in the focus-related topics given in (49) below.

- (49) a. $x R \text{ mary}$
 b. $x R_m$, where $R_m(x)$ iff $R(x, \text{mary})$

What is important for our present purposes is that under either analysis, there are two variables introduced in generating the focus-related topic of (45). I will remain neutral for now between the two options. If we take the simple-minded view of instantiation hinted at above and assume that every variable in a focus-related topic must correspond to an element in the context of the same semantic type, then this example cannot be handled by the analysis. In order for either of the focus-related topics in (49) to be satisfied, the context would have to contain a two place relation holding of *Mary* and someone else, and yet the context given contains no such relation.

Two possible solutions suggest themselves for how to avoid the problems posed by this example. The first is to allow the two foci in (45) to combine into one and replace the result with a single variable in determining the focus-related topic of the sentence. The focus-related topic for the sentence would then be one of the expressions given in (50) below.

- (50) a. $R \text{ mary}$
 b. R_m , where R_m iff $R(\text{mary})$

Regardless of which of the two representations in (49) we start with, however, it is difficult to see how to produce either of the focus-related topics given in (50) without violating the principle of strict compositionality. Any solution along these lines would require semantic

composition of two elements – a transitive verb and its subject – which do not form a constituent at any level of representation. Going from (49a) to (50a), the violation of strict compositionality is readily apparent. Going from (49b) to (50b), the violation is less obvious, yet still unavoidable. As represented in (49b), the variable associated with the VP ranges over properties which relate *Mary* to some subject. Combining such a property with a subject will thus result in a proposition in which *Mary* is related to the subject. That is, the resulting proposition will still be represented as a two-place relation holding between *Mary* and a subject. Reducing this relation to a one-place relation holding of *Mary* requires combining the relational term and the subject term into a single property-denoting expression, but this is just bringing a violation of strict compositionality in through the back door. I take these objections to be sufficient grounds for rejecting such an approach.

The second possible solution to the problem is to modify the way in which we generate focus-related topics in the first place, so that the focus-related topic generated for a sentence like (45) is directly instantiated in (46). This is the approach I will pursue. The basic idea behind this approach is to generate the focus-related topic of a sentence directly from the deaccented elements of a sentence, ignoring foci except insofar as their presence is required by some deaccented element. This approach will allow us to generate a focus-related topic for (45) which consists entirely of the object *Mary*, since this is the only deaccented element in the sentence and it does not select any of the foci of the sentence. The problem of having to combine foci on this approach simply does not arise, and so neither does the problem of potentially violating strict compositionality. Developing such an approach to focus-related topic will require making explicit the relation that holds between syntactic focus assignment, focus-related topic, and phonological accent, about which I have said little so far. I will develop the alternative analysis sketched above immediately below. There, I first take a closer look at the interaction between the semantic and phonological aspects of focus assignment, and after that will return to a detailed analysis of cases involving multiple foci.

2.4 Phonological Accent and Semantic Focus

In section 2.3.3, I argued that the generation of focus-related topics must be flexible enough to allow the focus-related topic of a sentence like (45) to be instantiated in a context like that in (46) (repeated below). I assumed there that (45) should be analyzed as containing two foci – one containing the subject and one containing the verb – and argued that such an assumption makes it impossible to account for the felicity of the discourse fragment in (46) under an analysis of focus-related topics in which the variables substituted in for the foci of a sentence play an ineliminable role. The problem, recall, is that (45) would have to be associated with a focus-related topic equivalent to (51), but generating such a focus-related topic from a sentence which contains two foci would inevitably violate the principle of strict compositionality.

(45) JOHN COMFORTED *Mary*.

(46) MARY was CRYING, so JOHN COMFORTED *Mary*.

(51) $\lambda R[R(\textit{mary})]$

I claimed that this problem could be avoided by an analysis which generates the focus-related topic of a sentence directly from the deaccented elements of the sentence, though I left this claim undefended. In this section, I defend this claim by working out the details of such an analysis.

2.4.1 Semantic Focus Identification

In order for an analysis along the lines proposed to be viable, it is necessary to be able to determine what the deaccented elements of a sentence are. I have so far been assuming that deaccented elements are those elements which are excluded from the semantic focus of a sentence. However, I have not yet said under what conditions a given element can be identified as part of the semantic focus, or under what conditions an element can be taken to be excluded from the semantic focus. There are two general approaches which have been taken to this question. The first approach is that of Chomsky (1971), according

to which any constituent which contains a phonologically accented element qualifies as a potential semantic focus for a sentence. This approach can be seen as a minimalist approach in that the only restrictions it assumes are restrictions which are adopted by every analysis. Later analyses such as Selkirk (1984) and Rochemont (1986) have argued for a narrower conception of semantic focus according to which only a specified subset of those constituents containing a phonologically accented element qualify as potential semantic foci. The mechanisms argued for by all these authors for associating semantic focus and phonological accent are quite different, as are the corresponding conceptions of semantic focus which underlie the analyses. In order to determine when an element is or is not contained in a semantic focus of a sentence, then, we must first have an independent notion of what it means for something to be a semantic focus in the first place.

2.4.1.1 The Natural Response Test

By far the most common test used for determining the potential semantic foci of a sentence is what I will call the *natural response test*. The underlying idea behind the test is that a sentence will qualify as a natural response to a question/negative sentence only if the presupposition of a question/negative sentence and the focus-related presupposition of an answer are identical in relevant respects. Accordingly, by showing that a sentence with a particular focus structure is a natural response to a question with presupposition *P*, it follows that that sentence itself presupposes *P*. If the arguments of the previous sections are correct in showing that what have traditionally been assumed to be (focus-related) presuppositions are really focus-related topics, then clearly this test will have to be modified if it is to be of any use in identifying the focus-related topic of a sentence. I will ignore this complication for the moment, however, to illustrate how this test has been used and what it has been taken to show.

The test itself originates in Chomsky (1971). Although Chomsky himself does not give an explicit characterization of the test, we can reasonably reconstruct such a test from the clues he gives as to how it applies. I give such a reconstruction below based

upon yes-no questions/negative sentences and their responses.⁴

- (52) Given a sentence $S = \dots F \dots$, F is a semantic focus of S if
- i: F contains an element which is phonologically accented, and
 - ii: there is an F' such that F' contains a phonologically accented element and "(No,) ... F' ..." is a natural response to the yes-no question/negative sentence formed from S .

The intended application of this test is to examples like the following where, as Chomsky observes, the question/negative sentence in (53) can be answered naturally by any of the responses given in (54).

- (53) $\left\{ \begin{array}{l} \text{He wasn't} \\ \text{Was he} \end{array} \right\}$ warned to look out for an ex-convict with a red SHIRT (?)

- (54) a. (No,) he was simply told to be more CAUTIOUS.
b. (No,) he was warned to expect a visit from the FBI.
c. (No,) he was warned to look out for an AUTOMOBILE salesman.
d. (No,) he was warned to look out for an ex-convict wearing DUNGAREES.
e. (No,) he was warned to look out for an ex-convict with a CARNATION.
f. (No,) he was warned to look out for an ex-convict with a red TIE.

(53) is by assumption the yes-no question/negative sentence formed from the sentence in (55) below. The naturalness of the responses in (54) to (53) is then taken to show that any of the phrases in (56) constitute potential semantic foci for (55).

- (55) He was warned to look out for an ex-convict with a red SHIRT.

- (56) a. warned to look out for an ex-convict with a red shirt
b. look out for an ex-convict with a red shirt
c. an ex-convict with a red shirt
d. with a red shirt
e. a red shirt
f. shirt

⁴The formulation of the natural response test given here is based on a suggestion by Noam Chomsky (p.c.).

If we adopt the test as given above, then this conclusion regarding possible semantic foci is unassailable. However, the test as stated actually makes most of the responses given in (54) unnecessary for establishing this conclusion. According to (52), that any of the phrases in (56) are potential semantic foci for the sentence in (55) follows from consideration of (54f) alone as a natural response to (53). (52) states that a constituent *F* is a semantic focus of a sentence if there is an *F'* which can substitute in for *F* in the response to the question/negative sentence formed from that sentence. The only restriction on *F* and on *F'* other than this is that each must contain a phonologically accented element. Suppose that we take *F* to be (56d). Then if we choose as our *F'* the phrase *wearing DUNGAREES*, we derive the sentence in (54d). The fact that this sentence constitutes a natural response to the question in (53) thus indicates that the phrase originally chosen as *F*, i.e. (56d), is a potential semantic focus for (55). However, the exact same conclusion follows if instead of the phrase *wearing DUNGAREES* we choose as our *F'* the phrase *with a red TIE*, since this phrase meets all the restrictions required to hold of *F'*. Substituting this phrase in for *F* in (53) gives the sentence in (54f), which we have already determined to be a natural response to (53). Thus, consideration of (54f) alone is sufficient to establish that (56d) is a potential semantic focus of (55). By the same reasoning, it is easy to see that the naturalness of the response in (54f) is sufficient to show that any of the phrases in (56) is a potential semantic focus for the sentence in (53).

The ability to use a single response to a question to identify any of a number of constituents as potential semantic foci has two drawbacks. The first drawback is that it is impossible to use the test as given in (52) to argue conclusively for a narrow semantic focus in any particular sentence. The most that can be shown is that the semantic focus *might* be narrow. Consequently, the test can only be used to determine the potential semantic foci compatible with any given phonological accent assignment in a sentence, and cannot (except in extreme cases) be used to determine what the *actual* semantic focus of a sentence is in a given instance. This of course is not a fault of the test, but merely a limitation of its applicability. A more serious problem facing this test is that it gives intuitively implausible results in cases in which accent location differs from what it

was in (53). To illustrate, consider the sentence in (57).

(57) He was warned to look out for an ex-convict with a RED shirt.

We can use the naturalness of the question/answer pair given in (58) to show that *red* is a potential semantic focus of this sentence.

(58) a. Was he warned to look out for an ex-convict with a RED shirt?
b. (No), he was warned to look out for an ex-convict with a BLUE shirt.

By the reasoning employed in the previous paragraph, however, the naturalness of this same question/answer pair can equally be used to indicate that any of the phrases in (56a-e) is a potential semantic focus for this sentence, a conclusion which does not receive any independent support. In the case of (53), we saw that the naturalness of the single sentence (54f) could be used to show that any of the phrases in (56) is a potential semantic focus for the sentence. This conclusion was plausible largely because of the fact that in each case other than in (56f) the same conclusion could have been reached with a different question-answer pair in which the constituent substituted in for *F* was completely distinct from *F*. In the case of (57), on the other hand, there is no such corroborating evidence that the semantic focus of the sentence can include anything other than the word *red*. For example, none of the sentences in (54a-e) qualify as natural responses to the question in (58a). While the test does not predict that these responses *should* be possible, it also gives no explanation for why no such response in fact *is* possible. Thus, the only evidence that any of the phrases in (56a-e) are potential semantic foci for (57) is the naturalness of the question-answer pair in (58).

If the intuitive implausibility of analyzing the phrases in (56a-e) as potential semantic foci for (57) were the sole objection to the test formalized in (52), the objection would carry little weight. However, recall that one of the main reasons the test was needed in the first place was to give an independent characterization of semantic focus which could be used in the analysis of focus-related topics. If we adopt this characterization of semantic focus for the purpose of determining what the focus-related topic of a given sentence is, however, we find ourselves unable to explain the infelicity of several discourse fragments.

According to the analysis developed in the previous sections of this chapter, the focus-related topic of a sentence is generated by replacing the semantic foci of a sentence by variables. The analysis then states that a sentence will be felicitous in a given active context only if the focus-related topic of the sentence is instantiated in that context. If we use the characterization of semantic focus given by the natural response test, we predict that the sentence in (57) should be felicitous (with respect to the focus-related presupposition of the sentence) in contexts which instantiate any of the focus-related topics in (59), since according to the natural response test each of these qualifies as a potential focus-related topic of (57).

- (59)
- a. He was warned to look out for an ex-convict with a x shirt.
 - b. ~~He was~~ warned to look out for an ex-convict with a x .
 - c. He was warned to look out for an ex-convict x .
 - d. He was warned to look out for x .
 - e. He was warned to x .
 - f. He was x .

The analysis would therefore predict that (57) should be felicitous in contexts like those given below, and yet clearly this is not the case.

- (60)
- a. First he was warned to look out for an ex-convict with a red tie.
Then # he was warned to look out for an ex-convict with a BLUE shirt.
 - b. First he was warned to look out for an ex-convict wearing dungarees.
Then # he was warned to look out for an ex-convict with a BLUE shirt.
 - c. First he was warned to look out for an insurance salesman.
Then # he was warned to look out for an ex-convict with a BLUE shirt.
 - d. First he was warned to expect a visit from the FBI.
Then # he was warned to look out for an ex-convict with a BLUE shirt.
 - e. First he was told to be more cautious. Then # he was warned to look out for an ex-convict with a BLUE shirt.

Adopting the characterization of focus given by the natural response test would thus force a major revision in the analysis of focus-related topics in order to account for the infelicity of these examples. It is difficult to see how any such analysis could be based upon the notion of semantic focus as given by the natural response test above, however.

In order to avoid running into problems with examples like those in (60), it would appear necessary to restrict the possible semantic foci of the sentence in (57) to the word *red*. If we are to use some variation of the natural response test to obtain this result, clearly some changes in the formulation of the test given in (52) will have to be made. For ease of reference, I repeat the natural response test below.

- (52) Given a sentence $S = \dots F \dots$, F is a semantic focus of S if
- i: F contains an element which is phonologically accented, and
 - ii: there is an F' such that F' contains a phonologically accented element and “(No,) $\dots F' \dots$ ” is a natural response to the yes-no question/negative sentence formed from S .

There are two obvious changes one could make in this formulation to obtain the desired results. The first would be to stipulate that any given question/negative sentence-answer pair identifies at most a single constituent as a potential semantic focus, that constituent being the smallest constituent which satisfies the constraints on F in (52). In the original set of examples considered above, the naturalness of (54f) as a response to (53) could then only be used to identify (56f) as a potential semantic focus of (55) since this represents the narrowest possible focus assignment which satisfies the natural response test. Likewise, with (57), the naturalness of the question-answer pair in (58) could only be used to identify *red* as a potential semantic focus since this again is the narrowest possible focus assignment which satisfies (52). The account is of course stipulatory, but it will yield the desired results. The second change one could make in the formulation of the natural response test would be to alter the restrictions themselves. As mentioned earlier, and as is evident in (52i), the only restriction Chomsky assumes on the relation between a semantic focus and a phonological accent is that the former must contain the latter. The lack of any further restrictions on this relation makes it possible to identify any of the phrases in (56) above as a possible semantic focus for (57), an identification which as we saw lead us into trouble. Allowing only a restricted subset of the constituents which contain a phonologically accented element to qualify as potential semantic foci would again restrict the class of potential semantic foci for any given sentence, making it possible in principle at least to account for the facts considered above.

While it is possible to alter the natural response test along one of the two lines pro-

posed, making such a change without further evidence that it is required would amount to little more than a stipulation of facts. However, independent motivation for adopting one of these changes comes from consideration of an alternate formalization of the natural response test based on the naturalness of a sentence as an answer to a WH question. I give a formalization of such a test below.

- (61) Given a sentence $S = \dots F \dots$, if the the WH question Q formed from S by substituting a WH phrase in for F at D-structure and raising that WH phrase to the matrix Comp at S-structure is well-formed, then F is a potential semantic focus of S if and only if S is a natural response to Q .

Given the well-known constraints which apply to S-structure WH-movement, this test is unavoidably limited in its range of potential applicability. If the question formed according to the procedure given in the test is itself ill-formed, then the resulting question-answer pair will not be natural, but for reasons which have nothing to do with whether or not the constituent identified as F in the answer is a potential focus of the sentence. This is the reason for relativizing the test to cases in which the WH question is well-formed. The need to limit any test based upon WH question-answer pairs in this fashion was largely what drove Chomsky to develop the natural response test on the basis of yes-no questions and negative sentences. Despite its limitations, however, the test can be used to argue for a narrower conception of semantic focus than that derived via the original test given in (52) above.

To illustrate how the extension of the natural response test given in (61) functions, consider the sentence in (62).

- (62) John said that Bill saw SUE.

This sentence constitutes a natural response to any of the questions given in (63) below.

- (63) a. Who did John say that Bill saw?
b. What did John say that Bill did?
c. What did John say?
d. What did John do?
e. What happened?

According to (61), it follows that all of the constituents of (62) given below are potential semantic foci of this sentence, since these are the constituents of (62) which are substituted for by a WH expression in (63).

- (64) a. Sue
b. saw Sue
c. (that) Bill saw Sue
d. said that Bill saw Sue
e. John said that Bill saw Sue

This example contrasts with the sentence in (65), where the range of potential semantic foci as determined by (61) is much more highly constrained.

- (65) John said that Bill SAW Sue.

On the surface, the only distinction between this sentence and the sentence in (62) lies in the location of the phonological accent. However, this distinction makes a large difference in what constituents qualify as potential semantic foci for the sentence. This can be seen from the fact that (65) does not constitute a natural response to any of the questions given in (63) above. Indeed, the only WH question to which (65) does constitute a natural response is the question given in (66).

- (66) What did John say that Bill did to Sue?

Given the extension of the natural response test in (61), we can conclude from these facts that the only potential semantic focus of (65) is the verb *saw*.

When we compare the results of applying the extension to the natural response test to (65) to with the results of applying the original test to this example, we find that the two results diverge. In particular, according to the extension, none of the phrases in (64b-e) is a potential semantic focus of (65), while according to the original test they all are. Once again, when we consider the role which semantic foci play in focus-related topic generation, we find that the narrower conception of focus – that given by the extension in (61) – gives us the desired results. Of the following discourse fragments, only the first is acceptable, a result which will follow directly from the analysis of interaction between

focus-related topics and discourse contexts developed above on the assumption that the potential semantic foci of (65) are what is determined by the test in (61), but which will be unexplainable on the assumption that the potential semantic foci of the sentence are what the test in (52) determines them to be.

- (67)
- a. First, John said that Bill heard Sue.
Then John said that Bill SAW Sue.
 - b. First, John said that Bill went to the party.
Then, # John said that Bill SAW Sue.
 - c. First, John said that there was a party.
Then # John said that Bill SAW Sue.
 - d. First, John went to the party.
Then, # John said that Bill SAW Sue.
 - e. There was a party.
John said that Bill SAW Sue.

If the only potential semantic focus of (65) is *saw*, then in order for this sentence to be felicitous in a discourse the focus-related topic given in (68) must be instantiated in the discourse.

(68) john said that bill *R* sue

Of the discourse fragments given in (67), this situation obtains only in the example given in (a), and hence only this example is predicted to be felicitous, as is indeed the case. If all of the phrases in (64) were potential semantic foci, however, then each of the discourse fragments given in (67) would be expected to be felicitous, since (65) would then have as potential focus-related topics any of the topics given in (69) in addition to that given in (68), and one of these topics is instantiated in each of the discourse contexts in (67).

- (69)
- a. john said that bill *R*
 - b. john said that *P*
 - c. john *P*
 - d. *P*

Once again, the original version of the natural response test yields a definition of semantic focus which cannot be used in the determination of the focus-related topic of a sentence.

Now, however, we have an separate version of the test which does yield an acceptable characterization of semantic focus, at least for the limited range of cases to which it is applicable.

Since both of the above tests purport to be identifying the same thing – the potential semantic foci for a sentence – the fact that they diverge in what they identify as the potential semantic foci for some sentences indicates that they cannot both be maintained as formalized. If we assume that the analysis of focus-related topics developed earlier is essentially on the right track, then we can use this fact to argue that the WH question version of the test should be maintained as is while the yes-no question/negative sentence version of the test should be modified. However, our whole reason for looking at the natural response in the first place was to find an independent characterization of the potential semantic foci of a sentence to justify the semantic focus assignments assumed in developing the analysis of focus-related topics. To use this analysis to choose between the two tests would make the analysis circular. The most we can say is that the analysis of focus-related topics developed above is plausible to the extent to which the WH question form of the natural response test can be argued to take precedence over the yes-no question/negative sentence form of the test. Fortunately, such an argument can be made.

2.4.1.2 Association with “only”

The argument I would like to make in favor of the WH question form of the natural response test is based upon the interaction between the operator *only* and the focus structure of a sentence. The sensitivity of *only* and similar operators to focus structure was explored in depth in Jackendoff (1972), and has also been looked at by Anderson (1977), Taglicht (1984), Root (1985,1991), Kratzer (1989), and Tancredi (1991a,1991b) among others. While syntactic and semantic analyses of this operator differ, all analyses agree that there is a relation between the operator itself and some focused element in its scope, and that the focus structure assigned to a sentence affects not only the felicity conditions of utterance, but the truth conditions as well. The above analyses are all based on the premise that in the semantic interpretation of a sentence containing *only*, a focused constituent in the scope of *only* gets substituted for. The usual assumption is that

what replaces this focused constituent is a variable which is constrained to ranging over elements of the same semantic type as that of the focused constituent. What is important for our purposes is that this constituent is widely assumed to have to constitute a semantic focus. When a sentence has more than one possible semantic focus assignment consistent with its phonological accent assignment, the sentence will in general be ambiguous. To illustrate, consider the following sentence.

- (70) a. Bill only saw SUE.
 b. $\forall x[saw(bill, x) \rightarrow x = sue]$
 c. $\forall R[R(bill)] \rightarrow R = \lambda x[saw(x, sue)]$

According to both versions of the natural response test considered above, both *Sue* and *saw Sue* are potential semantic foci for this sentence. Since *only* is sensitive to the focus structure of a sentence, the interpretation assigned to this sentence as a whole will depend on which phrase is identified as the semantic focus for the sentence. If focus is assigned narrowly to *Sue* in (70a), the interpretation of this sentence is that given in (b), which can be paraphrased as *Everyone that Bill saw is Sue*⁵ (\equiv the only person Bill saw was Sue). If focus is assigned broadly to the entire VP, on the other hand, then the sentence is interpreted as (c), paraphrasable roughly as *Everything Bill did was see Sue* (\equiv the only thing Bill did was see Sue).

Consider now what happens when we alter the focus structure of this sentence as in (71).

- (71) Bill only SAW Sue.

If phonological accent on *saw* is consistent with semantic focus being assigned to the VP, then (71) should have an interpretation identical to that given in (70c) above, i.e. (71) and (70a) should share an interpretation. If on the other hand phonological accent on *saw* is not consistent with semantic focus being assigned to the VP, the only interpretation predicted to be available for this sentence would be that given in (72) below.

⁵This is clearly an unnatural English paraphrase of (a), but suffices to capture the intended reading of the sentence given in (b).

(72) $\forall R[R(\textit{bill}, \textit{sue})] \rightarrow R = \lambda x, y[\textit{saw}(x, y)]$

By determining whether (70c) is a possible interpretation for (71), then, we can simultaneously determine whether phonological accent assignment to the verb *saw* can result in semantic focus assignment to the VP. We can see from the following examples, however, that such an interpretation is unavailable for (71).

(73) John only SAW Sue.
That is, he didn't hear MARY/HEAR Mary.

If semantic focus assignment to the VP were possible in (71), we would expect the second sentence in (73b) to corroborate the first sentence in that example, and hence we would expect this discourse fragment to be acceptable. However, there are no circumstances in which this expectation is borne out. If we compare this situation with that which obtains with the sentence in (70a), we find a strong contrast in acceptability.

(74) John only saw SUE.
That is, he didn't hear MARY.

If we use the interpretation of (70a) given in (70c) to explain the acceptability of this discourse fragment, as I believe is necessary, and if we further assume that this same interpretation is available for (71), then the contrast between the acceptability of (74) and (73) would be unexplainable. The easiest way to explain the distinction is to assume that the two sentences fail to share an interpretation. If we make this assumption, then given the semantics for *only* sketched briefly above, the contrast between (73) and (74) can be taken to show that semantic focus assignment to the VP in (71) is impossible.

If the argument just given is valid, then the conclusion of the argument – that phonological accent on the verb *saw* is incompatible with semantic focus assignment to the VP – argues in favor of the notion of semantic focus given by WH question version of the natural response test considered in the previous section. According to this version of the test, phonological accent on the verb *saw* is only compatible with semantic focus assignment to that verb itself, while according to the original version of the test the same

phonological accent should be compatible with semantic focus assignment to the VP as well.⁶

2.4.1.3 Refinements and Caveats

We have just seen evidence favoring the WH question version of the natural response test in (61) over the original version of the test given in (52). However, as mentioned earlier, the WH question version of the test is limited in its applicability, in that it can only determine a constituent to be a potential semantic focus if a WH expression substituted in for that constituent could be moved at S-structure to the most local Comp. This means that for the original example considered in (55), we are left without any means for determining whether any of the constituents of the embedded NP *an ex-convict with a red SHIRT* are potential semantic foci for the sentence. This gap can of course be remedied, and in fact we have already seen in brief outline two forms that such a remedy can take. The remedy consists in revising the original version of the natural response test so that it agrees with the WH question version in all cases in which this latter version can be applied. The revision I adopt here is one argued for by Rochemont (1986), which restricts the relation between semantic focus assignment and phonological accent location by requiring that the phonologically accented element be the rightmost element of a constituent identified as a semantic focus. The resulting version of the natural response test is that given in (75) below.

⁶Actually, the WH question version of the natural response test is not strictly applicable to the case at hand, since there is no WH question which can be formed by substituting a WH expression in place of the verb and raising that WH expression to Comp at S-structure. In order to extend the test so as to apply to focused verbal elements, it is necessary to allow the "WH expression" which replaces the relevant verbal constituent to consist of the dummy verbal element *do* together with the WH expression *what*. Focus on the verb in the sentence in (i) will then be determined to be possible by the naturalness of (i) as a response to the question in (ii), while focus on the VP will be determined to be impossible by the unnaturalness of (i) as a response to (iii).

- i: John SAW Sue.
- ii: What did John do to Sue?
- iii: What did John do?

While such an extension will complicate the formulation of the test given in (61), it poses no conceptual problems.

- (75) Given a sentence $S = \dots F \dots$, F is a semantic focus of S if and only if
- i: F contains an element which is phonologically accented, and
 - ii: the phonologically accented element in F is the rightmost accentable element in F , and
 - iii: there is an F' such that F' contains a phonologically accented element which is the rightmost accentable element in F' and “(No,) $\dots F' \dots$ ” is a natural response to the yes-no question/negative sentence formed from S .

For arguments in favor of this particular restriction on the relation between semantic focus assignment and phonological accent location, I refer the reader to Rochemont (1986). We can see that this restriction will have the desired results in the problematic cases considered above since in each of these cases the only constituents of which the phonologically accented elements are the rightmost elements are the constituents consisting entirely of the phonologically accented elements themselves. I repeat the examples in question below.

- (76) a. He was warned to look out for an ex-convict with a RED hat.
 b. John said that Bill SAW Sue.

In (76a), the only constituent containing *red* as its rightmost accentable element is the AP dominating *red*, while in (76b) the only constituent containing *saw* as its rightmost accentable element is the V dominating this verb. Thus in these cases the only constituent which will satisfy the second requirement in (75) will be this AP and V respectively, and hence these will be the only constituents which could possibly be identified as semantic foci.

Before proceeding, it is worth noting what exactly the natural response test is and what it is not. What it is is a test for determining when a constituent is a potential semantic focus of a sentence, based on a relation that holds between two sentences, one a response to another. The way the test is to be applied is to take a sentence whose semantic focus structure is in question, construct an appropriate question/negative sentence from that sentence and then construct a response to that question/negative sentence by making an appropriate substitution for a particular constituent of the original sentence. What it is not is a felicity condition for sentences occurring in discourse contexts. The test itself makes no predictions about how the focus structure of a sentence will affect the felicity

of that sentence in a given context, nor is the felicity of a sentence as an answer to some question in a larger context assumed to be of any use in identifying the potential semantic foci of a sentence. This point is worth making explicit because without the ability to keep the natural response test separate from the question of felicity of an utterance in a given discourse context, any explanation of such felicity based upon the focus structure of a sentence as determined by the natural response test will be unavoidably circular. To the extent to which association facts of the sort considered in section 2.4.1.2 can be used to independently determine the possible semantic foci of a sentence, such circularity will not be devastating to the analysis. It is not clear to me at this point, however, that a completely general test for the potential semantic foci of a sentence can be based upon the semantics of *only*, and consequently avoiding circularity in the natural response test is important.

2.4.2 Focus-Related Topics Revisited

We now have all the tools needed to tackle the main problem of this section, that of relating the focus-related topic of a sentence to the focus structure of that sentence. I left this problem unsolved in section 2.3.3 above, although I hinted at a solution there. The main problem encountered in that section was that of accounting for the acceptability of (45) in the discourse fragment given in (46), repeated here.

(45) JOHN COMFORTED Mary.

(46) MARY was CRYING, so JOHN COMFORTED Mary.

I claimed that the analysis of the interaction between focus-related topics and contexts could be used to explain the felicity of this example only if it were possible to generate as the focus-related topic of (45) an expression equivalent to (51), repeated here.

(51) *R* mary

If we analyzed the original sentence in (45) as containing two separate foci, one containing the subject *John* and one containing the verb *comforted*, any analysis which attempted

to generate such a focus-related topic by substituting variables in for the foci and combining these variables into a one-place property would be unable to avoid violating strict compositionality. Such a problem could be sidestepped if it could be shown that the sentence does not in fact contain two separate foci. However, if we adopt the revised natural response test developed above, and if we further assume that every phonologically accented element must be contained in a semantic focus, concluding that (45) does indeed contain two foci becomes unavoidable. The simple explanation of why is that the only constituent which contains *John* as its rightmost accentable element is the NP directly dominating *John*, and similarly the only constituent which contains *comforted* as its rightmost constituent is the V directly dominating *comforted*. In order to satisfy the restrictions on the relation between semantic focus assignment and phonological accent location in (75ii), the sentence has to be analyzed as containing two semantic foci.

The way around the problem posed by this example I claimed is to generate the focus-related topic of the sentence directly from those elements which are excluded from the semantic foci of the sentence. Since we have just seen that the only assignment of semantic foci which is consistent with the phonological accents indicated is one in which the NP *John* and the V *comforted* each constitute independent foci, and since this assignment of semantic foci leaves *Mary* outside of any semantic focus, generating the focus-related topic of a sentence from the elements excluded from semantic focus in this instance comes down to generating the focus-related topic from the NP *Mary*. Suppose then that we take this NP to be the focus-related topic of (45). The prediction we will be led to is that the sentence in (45) should be felicitous in contexts which contain an occurrence of *Mary*, since any such context will instantiate the proposed focus-related topic according to the definition of instantiation given in (40). I believe this prediction to be correct, although other factors of relevance will undoubtedly enter into the overall determination of felicity of a discourse fragment. I give further contexts which support this analysis below.

- (77) a. MARY doesn't like ATTENTION. Still, JOHN COMFORTED *Mary*.
 b. JOHN saw BILL hit MARY, so JOHN COMFORTED *Mary*.

If focus-related topics are to be generated from the deaccented elements of a sentence (i.e. from those elements excluded from semantic focus), we must give a general characterization of how such generation is to proceed. For the sentence in (45), since the only deaccented element of the sentence was *Mary*, I simply stipulated that this element itself should be the focus-related topic of the sentence, without giving any indication of how to derive such a focus-related topic. In the majority of cases, however, there will be far more than a single deaccented element. We have already considered one such example in (36a), repeated here.

(36) a. *John BELIEVES Mary's alive.*

In this sentence, the only semantic focus assignment consistent with the accenting pattern is that in which the V dominating *believe* is analyzed as a semantic focus. It was noted above that this sentence is felicitous in contexts containing an occurrence of *John* as well as an occurrence of *Mary's alive*, but that separate occurrence of the phrases *John*, *Mary*, and *is alive* in a context is not sufficient for (36) to be felicitous. That is, a discourse fragment like that given in (78a) is felicitous, while one like that in (78b) (repeated from (37)) is not.

(78) a. *John doesn't know if Mary's alive. (However,) John BELIEVES Mary's alive.*
 b. *Mary doesn't know if John's alive. (However,) #John BELIEVES Mary's alive.*

This array of facts would receive a straightforward explanation under an extension of the standard theory according to which the focus-related topic of a sentence is generated by replacing the semantic foci of the sentence with variables. The resulting focus-related topic would then be that given in (79) below, which is only instantiated in the local context in the first of the examples considered above, and not in the second.

(79) *john R mary is alive*

However, we can no longer avail ourselves of such an analysis, since adopting such an analysis leaves us with no account for the example in (45), as we have just seen. None the less, if we are to generate the focus-related topic of this sentence from the deaccented

elements of the sentence, the resulting focus-related topic will have to be identical to (79) in relevant respects.

To obtain the desired results, I propose a minimal modification to the analysis of focus-related topics given in (38) above. There, I analyzed the focus-related topic of a sentence as the representation which results from replacing the semantic foci in the LF representation of the sentence with variables. We can account for the facts under consideration if we assume that the focus-related topic of a sentence is not the entire representation which results from this substitution of variables for semantic foci but rather a set of sub-structures derived from this representation. In the case of (45) (= *JOHN COMFORTED Mary*), we want the focus-related topic of the sentence to be *Mary*. In the case of (36), we need the focus-related topic to minimally include *John* and *Mary's alive*. Both of these results can be obtained if we take the focus-related topic of a sentence to be a set of partial LF representations, although giving a formal characterization of this set is fairly tricky. As a first approximation to such a characterization, consider the following.

- (80) Given a sentence S and its foci F_1, \dots, F_n , replace each F_i in the LF representation of S by a variable x_i . Call the resulting representation P . The *focus-related topic* of S is then the smallest set of partial LF representations $\mathcal{T} = \{\alpha_1, \dots, \alpha_m\}$ such that for each i , $1 \leq i \leq m$, α_i is the representation of the Complete Functional Complex (CFC) associated with some non-variable element in P , and every non-variable element in P is contained in some such α_i .

Applying this definition to the sentence in (36) will proceed as follows. First, we substitute a variable in for the focused verb *believe*, generating the representation in (81) (ignoring details).

- (81) [S John R [S Mary is alive]]

Then we identify the CFC's of the remaining elements. In this case, we end up with three CFC's, that of the matrix subject *John*, that of the embedded subject *Mary*, and that of the embedded predicate *alive*. These CFC's are given in (82).

- (82) {[NP John], [NP Mary], [S Mary is alive]}

The smallest subset of (82) which contains all of the elements *John*, *Mary*, and *alive* is that which consists of the first and third elements of (82). Thus, the revised focus-related topic of the sentence in (36) will be that given in (83) below.

(83) {[subNP John], [S Mary is alive]}

Notice that the variable substituted in for the verb is not a member of any of the elements of the set in (82) since it is not selected by any of the heads which are used to generate this set, and hence it appears nowhere in the focus-related topic of (36) in (83) either.

Having characterized the focus-related topic of a sentence as a set of representations rather than as a single representation, in order to make use of this notion in determining the conditions under which a sentence will be felicitous, it is necessary to slightly modify the current analysis. The felicity conditions given earlier for a sentence in a given context required that the focus-related topic of the sentence be instantiated in the context. Instantiation, however, is defined in such a way that the types of elements the definition applies to are syntactic representations, not sets of such representations. The simplest way to correct this problem is to adjust the felicity conditions which relate a focus-related topic to a context. I propose the following modification.

(84) A sentence *S* with focus-related topic $\{x_1, \dots, x_n\}$ will be **felicitous** in an active context *C* just in case for each $i, 1 \leq i \leq n, x_i$ is instantiated in *C*.

Considering once again the discourse fragments given in (78) above, we can see immediately that each of the elements of the focus-related topic given in (83) is instantiated in the active context consisting of the first sentence of (78a) and hence the felicity of this example is expected. In the case of (78b), however, we find that the second element of the focus-related topic given in (83) is not instantiated in the active context consisting of the first sentence of that example. The infelicity of this example is thus exactly what the present analysis predicts.

While the intuition behind the above treatment of focus-related topics is fairly clear, the characterization given in (80) is still somewhat imprecise. The analysis assumes that a syntactic representation can be given corresponding to the Complete Functional Complex of any head, although it is not entirely clear how this is to be done. For example,

consider cases like those in (85a-c) in which a deaccented verb selects a CP complement.

(85) BILL *claimed* JOHN COMFORTED *Mary*.

Here, there are two deaccented elements in the sentence, the matrix verb *claimed*, and the embedded object *Mary*. This latter element is unproblematic under the current analysis. However, the question of how to represent the CFC of the matrix verb *claimed* is more difficult to deal with. According to the analysis of focus-related topics given above, the input for generation of the focus-related topic of (85) should be the representation in (86).

(86) x *claimed* y *R* *Mary*

Given that the verb selects both a subject and a complement clause, if we are to include the complete functional complex of the verb in the focus-related topic for this sentence, both the subject and the embedded clause must be represented. The only representation available for the complement clause, however, is the representation *y R Mary*. If we take this as our representation of the complement clause in generating the focus-related topic of (85), the focus-related topic which results will be the set containing the expression in (86), and we correspondingly predict that (85) should only be felicitous in contexts in which (86) is instantiated. This prediction is not borne out, however. In order for (86) to be instantiated in a context, the context will have to contain a sentence with *claim* as a predicate, and with a complement clause of *claim* consisting of a two-place relation one of whose arguments is *Mary*. In examples like (87) below, however, we find that the sentence in (85) is perfectly acceptable despite the fact that these conditions are not met.

- (87) a. SUE *claimed* that MARY was CRYING. Then, BILL *claimed* JOHN COMFORTED *Mary*.
b. MARY *claimed* that JOHN is a JERK. However, BILL *claimed* JOHN COMFORTED *Mary*.

In (87a), we see that it is possible for the complement to *claimed* in the context sentence to consist of a one-place relation holding of *Mary*, not a two-place relation, and yet the

discourse fragment is still acceptable. In (87b), we find that the complement to *claimed* in the context sentence need not even contain *Mary* in order for the discourse fragment to be felicitous. If we take the focus-related topic of (85) to be the set consisting of the representation in (86), we have no way of explaining the acceptability of these discourse fragments. To avoid this problem, we clearly have to prevent assigning this set as the focus-related topic of the sentence in the first place.

To account for the facts illustrated in (87), it would appear that the focus-related topic for (85) must at most contain an unanalyzed variable as the complement to the verb *claimed*. However, for the same reasons that we could not take the focus-related topic of (45) (= JOHN COMFORTED *Mary*) to consist in a single unanalyzed variable, we cannot combine the complement clause into a single variable here either. To do so would inevitably violate strict compositionality. The only other way of generating a suitable focus-related topic for the sentence would be to assume that the internal structure of the complement clause simply cannot play a role in determining that part of the focus-related topic of the sentence generated from the verb *claimed*.

While such an assumption might be viewed as an unwanted stipulation, there is some independent support for this assumption. We have already seen several cases in which the first conjunct of a complex sentence can be used to license deaccenting in the second conjunct. To explain these cases it is necessary to assume that the first conjunct is added to the context prior to evaluation of the second conjunct. Surprisingly, however, when we look at complement clauses, we find that deaccenting within a complement clause can be licensed by a verbal constituent containing the verb which selects that clause, as illustrated in the following example.

- (88) JOHN reminded MARY that BILL *reminded Mary* that JOHN COMFORTED *Mary*.

Assuming as always that this sentence occurs context initially, the only way to account for the deaccenting of the second occurrence of the phrase *reminded Mary* is to assume that the first occurrence of that phrase has been added to the context prior to determining the felicity of the complement clause containing the second occurrence. Since the first occurrence of this phrase does not constitute a complete sentential unit, the conclusion

we are forced to draw is that it must be possible to add non-sentential elements to an active context, augmenting the context incrementally. If we assume, as seems natural, that the felicity condition on focus-related topics must be applied to a phrase before that phrase is added to the context, it follows that the focus-related topic of a constituent containing an embedding verb cannot be forced to include any elements from the verb's complement clause.

In order to incorporate these observations into the analysis of focus-related topics, I propose to maintain in rough form the characterization of focus-related topics given in (80) above, but to change the implicit assumptions regarding the input structure for calculating focus-related topics. Rather than taking the LF representation of the entire sentence to be the input to calculating the focus-related topic of the sentence, I take the input to consist of the highest sentential constituent which has not yet been added to the context minus any other sentential constituents contained therein. In processing the sentence in (88), then, the first structure to be processed is that consisting of the matrix subject, verb and object – [S [NP John] [VP reminded [NP Mary] Δ]] – where Δ is simply a place-marker for the embedded clause. Since there are no deaccented elements in this clause, its focus-related topic is null, and hence the felicity condition on focus-related topics is vacuously satisfied. After this clause is processed, it is added to the context, and the next clause is processed. Since this clause contains two deaccented elements – *reminded* and *Mary* – the focus-related topic for this clause will be non-null, and according to (80) will consist in the singleton set { *x reminded Mary Δ* }. This single element contained in the focus-related topic is directly instantiated in the context, and hence the clause satisfies the felicity condition on focus-related topics. The clause is then added to the context, presumably by substituting in for the Δ in the representation of the matrix clause. We then come to the most deeply embedded clause, whose focus-related topic we have already determined to be the singleton set consisting of the NP *Mary*. Again, this element is instantiated in the context and hence the clause satisfies the felicity conditions in (84). In this way, the sentence as a whole comes to satisfy the constraints on focus-related topics piece by piece. The analysis given is admittedly fairly stipulative. While it appears to work, I do not at present have a principled explanation for

why context incrementation should proceed as the analysis requires. What is clear is that some explanation along the lines sketched here is required if constraints on deaccenting are to be given in terms of instantiation of a focus-related topic in the local context. What is unclear is what constraints there are on context incrementation as well as what the input should be for calculating focus-related topics. I have only outlined one of a wide range of possibilities. Unfortunately, I have to leave further investigation into these issues for future research.

2.4.3 Standard Presuppositions and Focus-Related Topics

In developing the above analysis of focus-related topics, I originally assumed that focus-related topics constitute a subclass of presuppositions of the type that Karttunen and others have been concerned with. However, I then argued that focus-related topics should be handled in a fashion distinct from the way Karttunen treats typical instances of presupposition, contexts being required to *instantiate* rather than *entail* the focus-related topic of a sentence. This raises the question of whether the types of presupposition which concerned Karttunen and the focus-related topics which have been our primary concern here should be treated identically, or whether they should be kept conceptually distinct. Since we have seen that the treatment of focus-related topics cannot readily be reduced to that of standard presuppositions, if we are to treat them identically and if furthermore we accept the analysis of focus-related topics provided in the text, then it follows directly that the treatment of standard presuppositions will have to be reduced to that of focus-related topics. The question of whether the two phenomena can be treated identically thus reduces to the question of whether we can use the account of focus-related topics developed above to account for classical instances of presupposition. When we look at the kinds of facts which standard treatments of presupposition are designed to account for, however, we find that such a reduction is highly implausible at best.

Prima facie evidence that the two notions should be kept distinct derives from differences in the types of infelicity to which presupposition failure can give rise in the two cases. In the types of examples which originally motivated discussion of presupposition, such failure typically affects the potential truth or falsity of the sentence which gave rise

to the presupposition in question. This affect has been described in various ways. Under some characterizations, the sentence is said to lack a truth value, while under other characterizations it is said to have a definite truth value. A typical such case is exemplified in the (a) examples below, which in non-Russellian analyses are commonly assumed to presuppose the propositions in (b). In (c), I give the sentences from (a) in contexts which contain an explicit contradiction of the presuppositions in (b), making it impossible for the context to entail that presupposition.

- (89) a. The king of France is bald.
 b. There is a king of France.
 c. It is not the case that there is a king of France. The king of France is bald.
- (90) a. John stopped beating his wife.
 b. John used to beat his wife.
 c. It is patently false that John used to beat his wife. Today, John stopped beating his wife.

Intuitions about the truth status of the (a) sentences in the contexts in (c) are somewhat variable. The one fact that everyone agrees on is that if the first sentence of (c) is true, it is not and in fact cannot be the case that the second sentence is also true. According to some (including e.g. Frege, Strawson and others), the second sentence is not false either, while others (including Russell, Quine) hold that it is false. Whatever one's views on the truth-status of this sentence, the fact that it cannot be true is taken to be connected to the fact that its presupposition is not satisfied. If we wish to maintain this relation between presupposition failure and potential truth or falsity of a sentence, however, then it is clear that we cannot reduce the standard analysis of presuppositions to the analysis presented above of focus-related topics. The reason for this is simple. Each of the contexts given above can be naturally and unobjectionably extended via accommodation to instantiate the presupposition of the sentence in (a). If we were to treat the above instances of presupposition along the lines of focus-related topics, neither of the examples in (c) would constitute presupposition failure, and hence the explanation for the infelicity of these examples would have to be unrelated to the presuppositions of these examples. Thus, the facts which presuppositions were originally intended to account for would have to be given an entirely separate treatment.

On the converse side of this problem, we find that failure of a focus-related topic of a sentence to be instantiated in a context never results in the sentence being incapable of bearing a particular truth value, lending further credence to an analysis which keeps the two types of presupposition conceptually distinct. Truth or falsity of a sentence is completely independent of whether its focus-related topic is instantiated, as can be seen in the following dialogue.

- (91) John slapped Mary, and then
- a. SUE SLAPPED JOHN.
 - b. SUE SLAPPED *John*.
 - c. SUE *slapped* JOHN.
 - d. *Sue* SLAPPED JOHN.
 - e. *Sue* SLAPPED *John*.
 - f. *Sue slapped* JOHN.
 - g. SUE *slapped John*.
 - h. *Sue slapped John*.

Here, all of these sentences have exactly the same truth conditions; each of the sentences will be true if and only if Sue slapped John. In the context given, however, the focus-related topic of the sentence is satisfied only in (a-c). By requiring focus-related topics to be instantiated in the context, the infelicity of the sentences in (d-h) can be accounted for straightforwardly. If presuppositions are invoked to explain the infelicity of the examples in (89) and (90), and if focus-related topics are invoked to explain the infelicity of the examples in (d-h) above, then neither one of the types of presupposition can be reduced to the other.

2.4.4 The Necessity of Deaccenting

The overall form of argument employed in the previous sections of this chapter has been to show that a sentence with a given focus structure is felicitous only in certain contexts, and that the acceptability of a sentence depends on whether the focus-related topic constructed from the deaccented elements of the sentence is instantiated in the context. One of the consequences of this analysis is that with respect to a given context a sentence will generally only be acceptable under certain assignments of focus structure and will be

unacceptable under others. I take this consequence to be welcome. However, when we look at particular instances in which sentences should or should not be acceptable, we find that the analysis developed so far is not without its potential problems. The most obvious potential problem can be illustrated with (91) (repeated here).

- (91) John slapped Mary, and then
- a. SUE SLAPPED JOHN.
 - b. SUE SLAPPED *John*.
 - c. SUE *slapped* JOHN.
 - d. *Sue* SLAPPED JOHN.
 - e. *Sue* SLAPPED *John*.
 - f. *Sue slapped* JOHN.
 - g. SUE *slapped John*.
 - h. *Sue slapped John*.

According to the analysis developed above, the focus-related topic will be instantiated in the local context only for the sentences in (91a-c), and not for those in (91d-h). As the analysis predicts, the sentences in (91d-h) are all unacceptable in the given context. However, the analysis also treats all of the sentences in (91a-c) identically, and yet clearly these sentences are not all equally acceptable. In fact, only (91c) appears to be completely unobjectionable, while (91a) and (91b) are surprisingly marginal. One might object to the present analysis, then, on the grounds that it cannot make the distinctions intuitively felt to hold between these cases.

The oddness of the examples in (91a) and (91b) above clearly shows that the analysis developed above is incomplete. It does not, however, argue against the treatment of focus-related topics developed there. The felicity condition for focus-related topics gives a necessary condition for a sentence to be acceptable, but I have nowhere indicated that satisfaction of this condition should also be viewed as a sufficient condition for felicity of a given sentence. To account for the examples above, what is required is some constraint on the use of focus of the type widely assumed to hold elsewhere in the literature (cf. Williams (1980), Culicover and Rochemont (1984), and Rochemont (1986), among others). Consistent with our assumptions about focus assignment from section 2.4, suppose we adopt the following hypothesis regarding the felicitous use of focus.

- (92) If α is a semantic focus of a sentence, then α must qualify either as a presentational focus or as a contrastive focus in the local active context.

Whether there are other uses of focus which ought to be included in (92) is a problem I do not wish to address at present, so I will restrict discussion to the two types of focus mentioned. On an intuitive level, a focused constituent α is a presentational focus only if α does not already occur in the context, while α is a contrastive focus only if there is some element in the context which is of the same semantic type as α but which is not itself an occurrence of α . I formalize these notions below.

- (93) If S is a sentence in a context C , and S contains a constituent α which bears the label [+F], then
- a. If C does not contain an occurrence of α , α qualifies as a *presentational focus*.
 - b. If there is some β in C of the same semantic type as α such that β is not an occurrence of α , then α qualifies as a *contrastive focus*.

Given these definitions of presentational focus and contrastive focus, the constraints on the felicitous use of focus given in (92) will allow us to make the necessary distinctions in the acceptability of the sentences in (91a-c) above, repeated here.

- (91) John slapped Mary, and then
- a. SUE SLAPPED JOHN.
 - b. SUE SLAPPED *John*.
 - c. SUE *slapped* JOHN.

In all of these examples, *Sue* qualifies as a presentational focus since the context does not contain an occurrence of *Sue*. In (a) and (c), *John* similarly qualifies as a contrastive focus since there is an individual in the context with whom *John* contrasts. Formally, the context contains an occurrence of *Mary*, which is of the same semantic type as *John*, and *Mary* is not itself an instantiation of *John* and so (93b) is satisfied. When we look at the verb *slapped* in (a) and (b), however, we find that this verb qualifies neither as a presentational focus nor as a contrastive focus. It cannot be a presentational focus since the same verb occurs in the context. It cannot be a contrastive focus because no other two place predicate occurs in the context. Focus on the verb in these examples thus violates the focus condition given in (92) above – the verb is focused but cannot be interpreted as such in the context of utterance. The examples are consequently predicted to be unacceptable, as desired.

2.5 As For x . . .

There remains a class of cases in which acceptable focus patterns of a sentence cannot yet be predicted. The class of cases I have in mind are cases involving the *As for x* construction. (A similar case can be made using the *What about x?* construction, though I will not consider these cases here.) To see why these present a problem, consider the following contrast.⁷

- (94) a. MARY likes BILL, and # JOHN likes Sue.
b. MARY likes BILL, and as for SUE, JOHN likes Sue.

The unacceptability of the first example is exactly what is expected under our current hypothesis about focus-related topics. The focus-related topic of the second sentence in this example is the set { *x* likes Sue }, and the sole member of this set is not instantiated in the active context consisting of the first sentence in (94a). The problem comes when we look at the second example, since according to the analysis developed above, the focus-related topic of this sentence is essentially identical to that of the second sentence of the first example. Accordingly, one would expect the discourse fragment in (94b) to be every bit as unacceptable as that in (94a), and yet the example is perfectly acceptable.

Since the only difference between the two examples under consideration lies in the presence or absence of the phrase *as for SUE*, it is clearly here that we need to look for an explanation of the difference in acceptability between the examples. There are two avenues available for accounting for the effect this phrase has on the acceptability of the discourse fragment as a whole within the analysis of focus-related topics developed above. The first would be to analyze this phrase as functioning to alter the focus-related topic of the sentence it is adjoined to. The second would be to analyze it as functioning to change the context. I will somewhat arbitrarily adopt the latter approach. From consideration of examples like the following, it appears that the role that *As for Sue* plays is a substitutive role.

⁷I use the name *Sue* instead of the pronoun *her* in the second sentence of these examples for ease of exposition. The same point could be made as well with a pronoun, though at this point I prefer to avoid problems associated with pronominal interpretation which are irrelevant to the present issue. While the use of a name here is somewhat unnatural, it does not obscure the contrast, and hence will suffice.

- (95) a. Mary likes Bill, and as for SUE, JOHN HATES *Sue*.
 b. Mary likes Bill, and as for SUE, JOHN *likes Sue*.
 c. Mary likes Bill, but as for SUE, I DOUBT *Mary likes Sue*.

All of these sentences could be explained straightforwardly if we assumed that *As for Sue* functioned to replace the NP *Bill* in the contextual sentence with the NP *Sue* and added the resulting representation to the context. However, if this is the only way to account for the felicity of the examples in (95), we should expect the felicity of each of the discourses to entail that *Mary likes Sue*, since this proposition is being added to the context. Such an implication is clearly lacking in these discourses, however, making such an analysis highly implausible.

The basic idea behind the analysis proposed – that *As for Sue* functions to substitute *Sue* in for some expression of the same semantic type in the active context – can be maintained if we can find a way to avoid adding the representation which results to the active context. The way I propose for doing this is to assume that active contexts contain (focus-related) topics in addition to more complete LF representations. The *As for* construction will then operate on focus-related topics, altering them directly via the substitution mechanism already mentioned and adding the altered focus-related topic directly to the context. Felicity of an *As for* sentence with respect to focus-related topic instantiation could be reduced to the general analysis of focus-related topics if we modify our definition of instantiation slightly. The definition as it stands states that a sentence is instantiated in a context only if its focus-related topic is identical to a potential focus-related topic of some other sentence already contained in the context. If we simply assume that potential focus-related topics of a sentence are automatically part of the context, then we could redefine instantiation so that the focus-related topic of a sentence is instantiated in a context only if that focus-related topic already occurs in the context. By making this minor change, the explanation of the felicity of *As for* sentences and that of the felicity of other sentences fall together.

Chapter 3

VP Deletion: The Solution

3.1 Introduction

In chapter 1, I noted a general problem facing analyses of VP deletion. The problem, it will be recalled, was the following. The primary data which motivates all current analyses of VP deletion is data which shows that there are restrictions on the possible interpretation of an elided VP. This data shows that ambiguities in an antecedent clause do not multiply in VP deletion contexts. Once an interpretation is fixed for the antecedent, the elided VP must receive the same interpretation. Such data have been offered as conclusive evidence that the LF representation of an elided VP must receive a unique interpretation, a conclusion with which I agree. Williams (1977) and Sag (1976) further argue that the constraints on interpretation of an elided VP must result directly from the analysis of VP deletion itself. We saw, however, that the VP deletion data finds a close parallel in examples containing a VP which has been deaccented but not deleted, and that none of the analyses of VP deletion discussed in chapter 1 can be extended in a principled fashion to account for the deaccenting data. I took this fact as indication that the general approach taken by Williams, Sag and others to the problem of VP deletion was ill-founded, and that the correct analysis should be based upon a general account of constraints on deaccenting. At that point, I left the VP deletion problem without a solution, and turned to constructing an account of these constraints in chapter 2. There, I argued that the deaccented elements of a sentence determine the focus-related topic of

the sentence, with felicitous use of a sentence within a given active context depending upon the focus-related topic of the sentence being instantiated in that context. In this chapter, I return to the original problem of accounting for restrictions on interpretation of the type found to hold in VP deletion and VP deaccenting contexts. I show that the similarities between these two types of cases can be given a principled explanation if we adopt this analysis of focus-related topic.

The form of argument used to motivate the analysis of focus-related topics in the previous chapter is based upon the felicity or infelicity of a sentence in a given context. Calculation of the focus-related topic of a sentence is taken to be independent of any antecedent. This means that restrictions imposed by a context on the interpretation of a sentence with a given focus-related topic have to be accounted for indirectly. The general form such an explanation will have to take is the following. Surface sentence S^1 has as potential logical forms $\varphi_1, \dots, \varphi_n$ which will be associated with focus-related topics P_1, \dots, P_n respectively. Of these topics, the context of utterance C only instantiates (say) P_i . In order for S to be felicitous in C , then, the actual logical form of S must be φ_i . While the context will play a role in disambiguating S , the role is not that of *supplying* an interpretation to S , but rather that of *filtering out* various potential interpretations of S .

3.2 General Form of the Solution

To summarize briefly the situation we were left with in chapter 1, I repeat below the basic cases which were found in need of explanation there.

- (96)
- a. John likes flying planes because BILL does.
 - b. John said he is brilliant before BILL did.
 - c. John likes flying planes because BILL *likes flying planes*.
 - d. John said he is brilliant before BILL *said he is brilliant*.
 - e. John likes soaring gliders because BILL *likes flying aircraft*.
 - f. John said he is brilliant before BILL *said he is a smart guy*.

¹I use the term "surface sentence" to refer to a string of words with a given phonological accent assignment.

As noted in that chapter, all of the theories of VP deletion considered provide an account of the interpretations available for the VP deletion sentences in (96a,b), but all would have to be modified to account for (96c,d), and none of the analyses could be extended in a principled fashion to account for the deaccenting sentences in (96e,f). The account of deaccenting given in the previous chapter, however, now gives us a way of handling all these cases.

3.2.1 Simple Ambiguity Resolution

To illustrate how the analysis of focus-related topics from the previous chapter can be used to explain the restrictions on interpretation in each of these examples, consider first the sentence in (96c). I take the two LF representations associated with the subordinate clause of this sentence to be those given below.

- (97) a. Bill likes [_S PRO flying planes]
b. Bill likes [_{NP} flying planes]

According to the analysis under consideration, the focus-related topic of the subordinate clause will be derived from the expressions in (98) below, which one depending on the interpretation independently assumed for the subordinate clause.²

- (98) a. *x* likes [_S PRO flying planes]
b. *x* likes [_{NP} flying planes]

Assuming as always that the active context at the point where the subordinate clause is processed consists entirely of the superordinate clause, the discourse fragment in (96c) will only be felicitous if the relevant focus-related topic in (98) is instantiated in this local context. According to the definition of instantiation given in (2.3.1) in chapter 2 (repeated below), the context will instantiate the relevant expression in (98) only if it contains some logical form which has this expression as a potential focus-related topic.

²I am simplifying the discussion here by assuming that there is a single focus-related topic for the entire sentence. Treating the controlled complement clause separately from the embedding clause in the (a) examples will make no substantive differences in the account of these examples, and so the added complication would only serve to obscure matters rather than clarify them.

- (99) A context C **instantiates** a focus-related topic α if and only if C contains some expression β such that α is identical to some potential focus-related topic of β .

γ is a **potential focus-related topic** of β if there is some expression β' which differs from β at most in its focus structure such that the focus-related topic of β' is γ .

With this much as background, we are now ready to consider specific cases.

Syntactically, the surface sentence in (96c) is associated with four different LF representations, depending on how the superordinate and subordinate VPs are analyzed. I give these four LF representations in (100).

- (100) a. John likes [_S PRO flying planes] because Bill likes [_S PRO flying planes]
b. John likes [_S PRO flying planes] because Bill likes [_{NP} flying planes]
c. John likes [_{NP} flying planes] because Bill likes [_S PRO flying planes]
d. John likes [_{NP} flying planes] because Bill likes [_{NP} flying planes]

While each of these LF representations is syntactically well-formed, they do not all behave alike with respect to the felicity condition on focus-related topics. In (100a,c), the focus-related topic of the subordinate sentence will be the expression given in (98a). In (100a) this expression is clearly instantiated in the context consisting of the superordinate clause, and hence the original sentence is predicted to be felicitous under this interpretation. In (100c), on the other hand, this expression is not directly instantiated in the context. Similar remarks apply to the sentences in (100b,d), where the focus-related topic (98b) is directly instantiated in the local context in the latter example but not in the former. The two interpretations represented by (100a,d) are exactly the two interpretations of the original sentence which were found to be acceptable, and the analysis of focus-related topics from the previous chapter gives us a straightforward explanation for why they are acceptable – these are the two examples in which the focus-related topic of the subordinate clause is directly instantiated in the active context of the superordinate clause.

While the acceptability of the sentences in (100a,d) can be explained directly within the analysis of focus-related topics under consideration, explaining the infelicity of the examples in (100b,c) requires a more complicated argument, for reasons given in section

2.3.1. As mentioned above, the focus-related topic of the subordinate sentence in these examples is not instantiated in the context of the superordinate clause. However, I argued in section 2.3.1 that in certain instances it must be possible to augment a context via accommodation, and that in these cases what was required for a sentence to be felicitous was for the focus-related topic to be instantiated in the augmented context. In order to explain the unacceptability of the examples in (100b,c), then, it must be shown that accommodation cannot save these examples.

I argued in section 2.3.1 that the proposition accommodated must be calculable as an implicature of the sentence in question in the (broad) context in which the sentence occurs. I also argued that the acceptability of a discourse fragment does not depend on whether such implicatures can be mechanically calculated, since this is always possible. Rather, I showed that calculation of an implicature of the required form will in general require certain assumptions to be made regarding a speaker's beliefs, and I argued that the acceptability of a given discourse fragment is best viewed as dependent on the plausibility of attributing to a speaker the beliefs required to make that discourse fragment well-formed. To explain the unacceptability of the sentence in (96c) under the interpretations indicated in (100b,c), then, it is necessary to show that the assumptions needed to make the discourse fragment well-formed are assumptions which are themselves unacceptable. This can be done as follows. I assume that the proposition which must be accommodated in order for the discourse fragment to be felicitous is the proposition *John likes* [_{NP} *flying planes*]. In order for this proposition to be accommodated, it must be calculated as a conversational implicature of the subordinate clause in the context of the subordinate clause. A plausible means by which this implicature could be calculated would be as follows. Suppose (96c) to have been uttered by a speaker who is following the Cooperative Principle. The subordinate clause has a focus-related topic of the form *x likes* [_{NP} *flying planes*]. It is part of the conventional meaning associated with focus-related topics that in order for a sentence to be relevant within a given context, the focus-related topic of the sentence must be instantiated in the context. This situation does not obtain, however. In order for the subordinate sentence to be relevant, then, it is necessary to add some proposition to the context which does instantiate the focus-related

topic of the sentence. A speaker who utters (96c) with the intended interpretation indicated in (100b) can generally be taken to know this to be so and to know that his audience knows this to be so. His audience can thus plausibly take him to intend for his listeners to add some proposition to the context in order to make his statement relevant, and to be capable of determining which proposition he intends them to add to the discourse. Since the only proposition which can be taken to be in the context is the proposition *John likes* [_S PRO *flying planes*], the speaker must assume that his audience can figure out the relevant proposition from this context alone. They can do this if they assume that the speaker assumes that *John likes* [_{NP} *flying planes*] follows from *John likes* [_S PRO *flying planes*]. If they make this assumption, then they can conclude that the proposition the speaker intends for them to accommodate is the proposition that *John likes* [_{NP} *flying planes*]. They can thus take the speaker to have implicated first that he or she takes the inference from *John likes* [_S PRO *flying planes*] to *John likes* [_{NP} *flying planes*] to be valid, and second (and consequently) that *John likes* [_{NP} *flying planes*]. Since it is necessary to be able to calculate the second implicature in order for (96c), under the interpretation given in (100b), to obey the felicity condition on focus-related topics (= (39) of section 2.2.3), and since calculation of this second implicature is dependent upon the assumption that the speaker accepts the inference specified above as valid, a person who utters (96c) with this as intended interpretation commits himself to the validity of this inference. However, this inference – that *John likes* [_{NP} *flying planes*] follows from *John likes* [_S PRO *flying planes*] – is certainly not a logically valid inference, nor is it likely to be taken as valid in normal discourse settings. The original sentence can only be as felicitous as this inference (or some similarly implausible inference) is unobjectionable. Since this inference is in fact fairly implausible, the original discourse fragment under the interpretation in question is predicted to be correspondingly unacceptable. As the reader can verify, a similar reasoning process can be gone through to account for the unacceptability of (96c) under the interpretation indicated in (100c) as well.

We are now ready to consider the slightly more complicated case given in (96e), repeated here.

(96) e. John likes soaring gliders because BILL likes *flying aircraft*.

Once again I take the sentence to be syntactically four ways ambiguous. I indicate the four potential readings for this sentence below.

- (101) a. John likes [_S PRO soaring gliders] because Bill likes [_S PRO flying aircraft]
b. John likes [_S PRO soaring gliders] because Bill likes [_{NP} flying aircraft]
c. John likes [_{NP} soaring gliders] because Bill likes [_S PRO flying aircraft]
d. John likes [_{NP} soaring gliders] because Bill likes [_{NP} flying aircraft]

The focus-related topic of the subordinate sentence I take to be one of the expressions given in (102), again which one depending on the interpretation associated with the subordinate sentence.

- (102) a. *x* likes [_S PRO flying aircraft]
b. *x* likes [_{NP} flying aircraft]

This example differs from (96c) in that here none of the LF representations given in (101) directly satisfies the felicity condition on focus-related topics. I claimed earlier, however, that the interpretations indicated in (101a,d) are felicitous, while those in (101b,c) are not. In order to account for this distinction, it must be shown that the context can be readily augmented in the former cases in such a way that the focus-related topics will be instantiated, but that such augmentation of the context is problematic in the latter cases.

As argued above, propositions can only be accommodated into a context if they can be calculated as implicatures of the sentence in question in its context of utterance. In the cases in (101a,c), the most likely candidate for such an implicature is that given in (103a), while in the cases in (101b,d) the most likely candidate for such an implicature is that given in (103b).

- (103) a. John likes [_S PRO flying aircraft]
b. John likes [_{NP} flying aircraft]

As is generally the case, in each of the four cases it is possible to calculate the relevant proposition to be an implicature. However, the four cases differ in what commitments they force upon an utterer of the sentence in question. In the case of (101a), the speaker

would be committed to holding that people who like to soar gliders like to fly aircraft. Since soaring gliders is a particular instance of flying aircraft, this commitment represents a generic truth and as such is unproblematic. In the case of (101b), however, the speaker would be committed to holding that people who like to soar gliders like aircraft that fly, and in (101c) that people who like gliders that soar like to fly aircraft, neither of which is unobjectionable. Finally, in (101d), the commitment the speaker would have to make is that people who like gliders that soar like aircraft that fly. Like the first example, this commitment is unproblematic; gliders that soar are a sub-type of aircraft that fly, so it is a generic truth that a person who likes the first type of object also likes the second. Taking the felicity of the examples to be dependent on the degree to which these commitments are acceptable, the analysis of focus-related topics under consideration once again gives us a natural account of the distinction between the four cases.

3.2.2 Pronoun-Induced Ambiguities

The case of (96d) is more complicated, though it too can be handled in a fashion similar to that in which (96c) was handled. The key to accounting for the strict and sloppy readings available for this sentence is to distinguish syntactically between two distinct treatments of a pronoun, one similar to what Sag and Williams call a referential interpretation and one closer to what they call a bound variable interpretation. As mentioned in footnote 6 of chapter 1, the term “referential” is highly misleading in describing possible interpretations of a pronoun. All the explanations argued for by Williams and Sag to restrict possible readings of pronouns in VP deletion sentences were intended as syntactic explanations (broadly construed). Reference, however, is a non-syntactic notion. The *referent* associated with a referring expression is a real-world individual, not an abstract mental representation. Real-world individuals, however, have no place in a theory of syntax whose objects are necessarily abstract. In particular, whether two expressions end up denoting the same real world individual or different real world individuals can play no direct role in the syntactic determination of the grammaticality of a sentence. At most, a syntactic representation can determine coreference with respect to a given theory of interpretation which relates abstract syntactic representations with real world

objects.

While this point is important, it is equally important not to lose sight of the contribution Williams and Sag made in distinguishing what appear to be two separate ways in which a pronoun can function syntactically. In order to make use of this distinction in an explanation of the restrictions on pronominal interpretation in VP deletion and deaccenting environments, we must find a way of reanalyzing this distinction in appropriately syntactic terms. Like Williams and Sag, my main objective will be to encode the function of a pronoun directly in the syntactic representation of the pronoun. Restrictions on interpretation of a pronoun in a deletion or deaccenting environment will then be handled by requiring that the pronoun in the deletion/deaccenting site function in the same way as that in the phrase which ultimately licenses the deletion/deaccenting. While the underlying idea is the same as that pursued by Sag and Williams, however, the specific analysis I adopt differ from theirs in two important respects. In the case of so-called referential pronouns, I argue that the interpretation assigned to a pronoun must be uniquely determinable from the syntactic representation not only when the pronoun is dependent on some other expression in the sentence but also when it is not. If two “referential” pronouns are completely identical in their syntactic representation, it will follow that they are interpreted identically as well, which in turn will ensure that whatever referent is associated with the one will also be associated with the other. In this way, coreference will fall out as a consequence of the analysis, but it will play no direct role in the analysis. In the case of bound variable pronouns, I argue that interpretation of a pronoun as a bound variable is dependent on that pronoun being linked (in the sense of Higginbotham (1983)) to some other element in the sentence. Adopting the technical treatment of linking spelled out in Heim (1992) in which linking is represented using indices, I show that if two pronouns are syntactically identical and one of the pronouns is linked, then the other pronoun must be linked as well. Strict and sloppy readings of pronouns in deletion and deaccenting environments will then fall out from the syntactic identity requirement imposed as part of the restrictions on deaccenting/deletion.

There are two aspects of Heim’s (1992) index based analysis of linking which I will be exploiting in the treatment of VP deletion and deaccenting sentences involving pro-

nouns. The first is the requirement that all “referring” expressions, including minimally all pronouns and proper names, bear an index, with interpretations assigned directly to indices rather than to the expressions bearing them. Under this view, the expressions which bear indices function merely as restrictions on the value assigned to the index. The second is the division of occurrences of indices into two types – those that are free, and those that are bound.³ Free occurrences of indices are assigned unique *guises*, where a guise is semantically an individual concept, i.e. a function from worlds to individuals. For our present purposes, guises can equally well be thought of as discourse referents in Kamp’s (1981) theory of Discourse Representation, or as files in Heim’s (1982) theory of File Change Semantics. Bound occurrences of an index are treated as variables which for Heim range over individuals. I depart from Heim here in treating them as variables ranging over guises, though this distinction is largely immaterial to the discussion at hand. The most important aspect of Heim’s analysis for our present purposes is the restriction she posits on the interpretation of an index – that all occurrences of a given index must be treated identically. While Heim makes this restriction explicitly only for free occurrences of indices, I will modify this restriction so that it applies to bound occurrences of indices as well. What this means interpretationally is that if one occurrence of an index *i* is assigned a guise **F**, then all other occurrences of *i* must likewise be assigned **F**. Similarly, if one occurrence of *i* is treated as a variable over guises, all other occurrences of *i* must be treated as variables over guises as well. This distinction between different types of occurrences of indices makes it possible to account for restrictions on interpretation of pronouns in deaccenting/deletion environments by simply requiring that deleted/deaccented pronouns bear the same index as their overt counterpart. Treatment as a variable over guises or as a unique guise will fall out from the above restrictions on index interpretation. What remains, then, is to formally capture the distinction between bound and free occurrences of indices.

As mentioned above, Heim’s (1992) analysis of referential dependencies is largely a

³A similar distinction is drawn in Fiengo and May (1991) between α -occurrences of an index (= free occurrences here) and β -occurrences of an index (= bound occurrences here). Indeed, with respect to interpretation of indexed expressions, Heim’s analysis and that of Fiengo and May are near notational variants. Both analyses incorporate ways of making the distinctions I wish to exploit. The motivation for choosing Heim (1992) as a basis for discussion is mostly a matter of personal taste.

reformalization of Higginbotham's (1983) linking analysis stated in terms of indices. For Higginbotham, if an element α is linked to another element β , then α depends on β for its interpretation, in that whatever interpretation is assigned to β is automatically inherited by α . This notion of linking is inherently asymmetric. Such an asymmetric notion cannot be represented with standard notions of indexing, however. Under standard indexing schema, indexed expressions bear a single index. For any two indexed expressions, there can be only two possible relations that hold between them in terms of indexical value – either the two expressions bear occurrences of the same index or they do not. Both of these relations, however, are completely symmetric – if α bears an occurrence of the same index as β , then β bears an occurrence of the same index as α , and similarly with occurrences of different indices. To represent the asymmetric relation of linking in terms of indices, Heim allows expressions to bear two separate indices, which she distinguishes as *inner indices* and *outer indices*. Inner indices are the ones I have discussed above, which function either as variables over guises, or as particular guises. Outer indices function to identify dependency (i.e. linking) relations. Inner indices are obligatory for all definite NPs, while outer indices are optional, giving rise to the following two indexing possibilities.

- (104) a. [NP_i]
 b. [NP_i]_j

Linking is then defined in terms of identity of indices as follows:

- (105) a. β is **linked to** α iff α 's outer index = β 's inner index.

With this machinery in place, it is now possible to formalize the desired distinction between bound and free occurrences of indices – an occurrence of an (inner) index is bound if and only if it is linked, i.e. if and only if that same index occurs as the outer index of some other expression. Otherwise, an occurrence of an index is free.

To see how the above analysis works, consider some of the possible derivations associated with the sentence *Bill said he is brilliant*. Assuming that both outer and inner indices are assigned by S-structure, the S-structure representations available for this sentence will be the following.

- (106) a. [Bill₁]₂ said he₁ is brilliant
 b. [Bill₁]₂ said he₂ is brilliant
 c. [Bill₁]₂ said he₃ is brilliant

While Heim assumes that expressions bearing outer indices must undergo QR in the mapping from S-structure to LF, we can ignore this complication here and treat the representations in (106) as the LF representations available for this sentence as well. The free indices in these examples are the indices 1 and 3. In interpreting these LF representations, then, these indices will each be associated with a unique guise, say **F** and **G** respectively. In contrast, the index 2 on the pronoun in (106) is bound, and will consequently be treated as a variable over guises. Representing variable binding as binding by a λ -operator, the above LF representations will result in the following partial interpretations.

- (107) a. **F**_{Bill} said **F**_{he} is brilliant
 b. **F**_{Bill} $\lambda x[x$ said x is brilliant]
 c. **F**_{Bill} said **G**_{he} is brilliant

(The notation **F**_{Bill} is intended to denote a guise **F** which in Heim's terms is presupposed to pick out an individual who is (a) "Bill".) Once these representations are fully interpreted, they will of course denote only two distinct propositions. (107a,b) will denote the proposition in (108a), where b denotes the individual picked out by the guise **F** in the world of evaluation, while (107b) will denote the proposition in (108b), where c denotes the individual picked out by the guise **G** in the world of evaluation. ❖

- (108) a. [said(b ,brilliant(b))]
 b. [said(b ,brilliant(c))]

Having just outlined the analysis I will be assuming for pronominal interpretation, we can now return to the original question of this section, that of explaining the restrictions on interpretation found to hold in (96d) (repeated here).

- (96) d. John said he is brilliant before BILL *said he is brilliant*

According to the analysis developed in chapter 2, this discourse fragment should only be felicitous if the focus-related topic of the subordinate clause is instantiated in the active context consisting of the superordinate clause. To simplify the discussion of this example, suppose temporarily that the subordinate clause is associated with a single, complex focus-related topic, ignoring for the moment the complications which arose in section 2.4.2 regarding the focus-related topic of sentences with embedded clauses. If we take this focus-related topic to be generated from the LF representation of the subordinate clause, as we have been assuming in general, there will be three possible focus-related topics for this clause corresponding to the three possible LF representations given in (106). I give these focus-related topics below, where I assume that substitution of a variable in place of a focused NP at LF replaces both the NP and its inner index, but leaves its outer index.

- (109) a. $[x]_2$ said $[he_1]$ is brilliant
 b. $[x]_2$ said $[he_2]$ is brilliant
 c. $[x]_2$ said $[he_3]$ is brilliant

In each case, this focus-related topic will be instantiated in the context only if the LF representation of the superordinate clause is derived in the same manner as that of the subordinate clause. As a result, the only non-redundant LF representations for (96d) which will satisfy the felicity condition on focus-related topics will be the following.⁴

- (110) a. $[John_4]_2$ said $[he_2]$ is brilliant before $[Bill_1]_2$ said $[he_2]$ is brilliant
 b. $[John_4]_2$ said $[he_3]$ is brilliant before $[Bill_1]_2$ said $[he_3]$ is brilliant
 c. $[John_4]_2$ said $[he_4]$ is brilliant before $[Bill_1]_2$ said $[he_4]$ is brilliant
 d. $[John_4]_2$ said $[he_1]$ is brilliant before $[Bill_1]_2$ said $[he_1]$ is brilliant

Taking the free occurrences of the indices 1, 3, and 4 to be associated with guises which denote the individuals *Bill*, *Sam*, and *John* respectively in the world of utterance, the above LF representations will be satisfied only in the following circumstances.

⁴I add one example here which is not strictly speaking already represented above, that in (110c). In reality, there will be as many well-formed LF representations for the subordinate clause as there are distinct combinations of indices having the same pattern of occurrence as the indices in (106). I will systematically minimize the number of such LF representations under consideration by eliminating redundant indexing patterns. Since the examples here contain an additional referring expression, and hence an additional non-redundant indexing pattern, I add a representation in which the pronoun bears this index. Hence the four LF representations corresponding to the three LF representations in (106).

- (111) a. John said John is brilliant before Bill said Bill is brilliant.
b. John said Sam is brilliant before Bill said Sam is brilliant.
c. John said John is brilliant before Bill said John is brilliant.
d. John said Bill is brilliant before Bill said Bill is brilliant.

Of course, under distinct assignments of guises to the free occurrences of the indices 1, 3, and 4, the circumstances in which the sentence will be true are different. However, beyond these, there are no further circumstances in which this sentence is true. Notice that these are the exact restrictions which were found to hold in (96d). The analysis thus gives us a way of accounting for the restrictions on interpretation which obtain for this sentence.

The above analysis was based on the simplifying assumption that the focus-related topic of the subordinate clause in (96d) consists of (a set containing) a single expression, composed of a variable, a verb, and an embedded clause. I argued in section 2.4.2, however, that in general we cannot assume that a complex sentence is associated with a single focus-related topic of this sort. The examples used to make that argument are repeated below.

- (87) a. SUE claimed that MARY was CRYING. Then, BILL *claimed* JOHN COMFORTED *Mary*.
b. MARY claimed that JOHN is a JERK. However, BILL *claimed* JOHN COMFORTED *Mary*.

The problem with generating (a set consisting of) a single focus-related topic for the second sentence in these examples is that any such topic will necessarily contain *Mary* as an argument of a two-place predicate contained in an embedded clause which itself is an argument of the verb *claimed*. According to the felicity condition on focus-related topics, in order for this sentence to be felicitous in these contexts, the contexts should have to contain a sentence with this same structure. Neither of the context sentences in (87) manifests this structure, however, and yet the discourse fragments in (87) are perfectly acceptable. To overcome this problem, I stipulated that the felicity condition on focus-related topics must be allowed to be satisfied incrementally, with the focus-related topic of the embedded clause having to be instantiated separately from that of the embedding

clause. It is a consequence of this revision to the basic analysis, however, that the simplified assumption adopted in the explanation of the restrictions on interpretation for the sentence in (96d) cannot be maintained, and the account given above must be revised accordingly.

If the most deeply embedded clausal argument in (96d) must be treated separately with respect to focus-related topic assignment, and if we maintain that the input for determining the focus-related topic of an element is the LF representation of that element, then under the analysis of pronominal interpretation sketched above, the focus-related topic of this clause will have to be one of the expressions given below.

- (112) a. [he₁] is brilliant
b. [he₂] is brilliant
c. [he₃] is brilliant
d. [he₄] is brilliant

The only thing distinguishing these representations is obviously the value of the index assigned to the pronoun. While these indices may well be interpreted differently within the larger sentence – the first, third and fourth are free in the LF representations in (110) in which they occur while the second is bound – if all we have to look at in determining the focus-related topic associated with these clauses is the clauses themselves, this distinction cannot be made within the representation of the focus-related topic. All that will be visible there will be a pronoun with an inner index.

Given the constraints on interpretation of indices outlined in the discussion of Heim's analysis, it turns out that the inability to distinguish between occurrences of bound indices and occurrences of free indices among the potential focus-related topics in (112) is not a problem. We saw in chapter 2 that in order for a sentence to be felicitous in a context, its focus-related topic has to be instantiated in that context. The definition of instantiation is based on identity between two expressions – the actual focus-related topic of the sentence in question, and a potential focus-related topic of some sentence contained in the context. In giving this characterization of instantiation, I glossed over the question of how to determine when two referring expressions are identical. In the present case, by assuming that the notion of identity includes identity of indexical value,

we can derive all the restrictions on possible interpretations of the sentence in (96d). To see how, consider the following candidate LF representations, the first two of which are identical to (110a,b) above.

- (113) a. [John₄]₂ said [he₂] is brilliant before [Bill₁]₂ said [he₂] is brilliant
b. [John₄]₂ said [he₃] is brilliant before [Bill₁]₂ said [he₃] is brilliant
c. [John₄]₃ said [he₂] is brilliant before [Bill₁]₂ said [he₂] is brilliant

By assumption, the focus-related topic of the most deeply embedded clause in (113a,c) will be that given in (112b), while that of the most deeply embedded clause in (113b) will be (112c). In all of the examples, this focus-related topic is directly instantiated by the embedded clause of the superordinate sentence, and hence all of these examples will satisfy the felicity condition on focus-related topics. However, when we subject these representations to interpretation, it turns out that only the first two representations are interpretable. As we already saw, assuming a proper assignment of guises to free indices, the circumstances under which (113a,b) will represent true propositions will be circumstances in which one of the following obtain.

- (111) a. John said John is brilliant before Bill said Bill is brilliant.
b. John said Sam is brilliant before Bill said Sam is brilliant.

But what of the LF representation in (113c)? If we ignored the values of the indices in this example, we might be tempted to assign this representation an interpretation which would be verified by the following circumstance (John, Sam and Bill all assumed to be distinct individuals).

- (114) John said Sam is brilliant before Bill said Bill is brilliant.

However, assigning such an interpretation would require treating the free occurrence of the index 2 as a specific guise and treating the remaining occurrences of this index as a variable ranging over guises. Since all indices are required to receive a unique interpretation, and since no index can simultaneously function as a unique guise and as a variable over guises, it follows that the LF representation in (113c) cannot be given a coherent interpretation.

The above illustration does not yet show that an interpretation verified by the circumstances indicated in (114) cannot be generated under our present assumptions. It does show that one potential method of generating such an interpretation which might have been considered at first glance to be plausible is not allowed under the present analysis. It is fairly simple to show from here, however, that no other potential LF representation for (96d) will both have the interpretation needed to be verified by (114) and satisfy the felicity condition on focus-related topics. In order to have an interpretation verified by (114), the inner index on the first occurrence of the pronoun *he* will have to be interpreted as a unique guise denoting *Sam*. The inner index on the second occurrence of *he*, however, will have to be interpreted either as a unique guise denoting *Bill*, or as a variable bound ultimately by the subordinate subject *Bill*. In the case in which the indices on each of the pronouns is free, since Bill and Sam are assumed to be distinct individuals, it follows that the guise which denotes the one will have to be distinct from the guise which denotes the other, and hence the corresponding indices will have to be distinct. In the case in which the index on the second pronoun is bound, since no index can be interpreted both as a unique guise and as a variable over guises, it again follows that the indices will have to be distinct. If the indices on the two pronouns are necessarily distinct, however, the first indexed pronoun will not instantiate the second, so the focus-related topic of the most embedded clause will not be able to be instantiated in (96d) as a whole.

The above explanation of the restrictions on the interpretation of (96d) depended crucially on our being able to restrict possible index assignments in two distinct ways. The first way is to restrict the class of interpretable LF representations by requiring that distinct occurrences of an index be interpreted identically. This restriction blocks multiple occurrences of an index where one of the occurrences is interpreted “referentially” (i.e. as denoting a unique guise) and another occurrence is interpreted as a variable over guises. The second way of restricting possible index assignments is to require identity of indexical value between indexed expressions in determining whether a given focus-related topic is instantiated. Here as before, the felicity condition on focus-related topics acts to filter out well-formed, interpretable LF representations which happen to be infelicitous in the discourse context.

It should be evident at this point that the above explanation can be used to predict the entire range of interpretations possible for the sentence in (96d). It is worth being clear on one issue which I have not yet addressed, however. I claimed above that distinct occurrences of an index must be interpreted identically. In the case where one occurrence of the index is given a unique guise as its interpretation, all other occurrences of that index have to be given the same unique guise as interpretation, blocking bound occurrences of the same index. I have said nothing further, however, about restrictions on bound occurrences of an index. As the reader has no doubt noticed, in order to account for a sloppy identity reading of (96d) under the proposed analysis, it must be possible for the pronoun in the superordinate clause and that in the subordinate clause to bear the exact same index despite the fact that they are bound by different expressions. That is, the only representation which will give rise to a sloppy reading and simultaneously satisfy the felicity condition on focus-related topics is that given below.

(115) [John₄]₂ said [he₂] is brilliant] before [Bill₁]₂ said [he₂] is brilliant]

I see no reason for blocking such accidental coindexing here, and since the only way to account for the sloppy reading of the example in question is to allow it, I do so. Since all other combinations of index assignments to the referring expressions in (96) raise no further substantive issues, and since the cases considered in detail so far provide all the tools necessary to account for the remaining interpretations available as well as for the restrictions found to hold, I leave it to the reader to work through the remaining cases at his or her leisure.

Accounting for the example in (96f) requires nothing beyond what we have already seen to be necessary so my discussion of it will be brief. I repeat the example here for ease of reference.

(96) f. John said he is brilliant before BILL *said he is intelligent*.

This example differs from (96d) only in requiring that some LF representation be accommodated into the active context prior to determining whether the focus-related topic of the subordinate clause is instantiated. The LF representation which is accommodated

must contain an occurrence of the phrase *he is intelligent*, with the index assigned to the accommodated pronoun identical to that assigned to the subordinate pronoun. We must be able to determine the interpretation assigned to this pronoun based upon the interpretation of the superordinate clause, reasoning roughly that if *John said [he_x] is brilliant*, then φ *[he_y] is intelligent*. There are several such paths one could take, a few of which I illustrate below. Here the arrow (\Rightarrow) is meant to indicate that the proposition denoted by the LF on the right is to be inferred from that on the left, and the # in the final two examples is meant to indicate that this inference would generally be considered to be faulty.

- (116) a. $[\text{John}_1]$ said $[\text{he}_1]$ is brilliant \Rightarrow $[\text{John}_1]$ indicated $[\text{he}_1]$ is intelligent
 b. $[\text{John}_1]_2$ said $[\text{he}_2]$ is brilliant \Rightarrow $[\text{John}_1]$ indicated $[\text{he}_1]$ is intelligent
 c. $[\text{John}_1]$ said $[\text{he}_1]$ is brilliant \Rightarrow $[\text{John}_1]_2$ indicated $[\text{he}_2]$ is intelligent
 d. # $[\text{John}_1]$ said $[\text{he}_1]$ is brilliant \Rightarrow $[\text{John}_1]$ indicated $[\text{he}_2]$ is intelligent
 e. # $[\text{John}_1]$ said $[\text{he}_3]$ is brilliant \Rightarrow $[\text{John}_1]_2$ indicated $[\text{he}_2]$ is intelligent

Here, the acceptable paths of reasoning are those in which the guise ultimately assigned to the pronoun is identical in the LF representations on either side of the \Rightarrow , assuming that the linking of one index to another identifies the interpretation of the former with that of the latter. In the case in which the binding expression denotes a unique guise (as with proper names), the bound expression as well will end up denoting that same guise. This means that the only change that will generally be allowed in the indexing of the pronoun is a change between a pronoun whose inner index is identical to the inner index of *John* and a pronoun whose inner index is identical to the outer index of *John*.

If we look at the effect this change can have on the range of circumstances predicted to verify the sentence in (96f), we find that allowing this change in indexical structure between the sentence originally contained in the context and that accommodated into the context is completely innocuous. Under the above assumptions about restrictions on accommodation, in addition to LF representations parallel to those of (96d) in (110), each of the following LF representations will be predicted to make a discourse fragment consisting of (96f) felicitous.

- (117) a. [John₁] said [he₁] is brilliant before [Bill₄] said [he₄] is intelligent
b. [John₁] said [he₁] is brilliant before [Bill₄]₂ [he₂] is intelligent
c. [John₁]₂ said [he₂] is brilliant before [Bill₄] said [he₁] is intelligent

The circumstances by which the interpretations of these representations will be verified are independently predicted to verify the sentence in (96f). These representations simply license a strict reading of the subordinate pronoun (coindexed with *John*) from a bound variable pronoun in the antecedent, and a sloppy reading from a “referential” one. Each of these readings is already predicted to be available, however, so accommodation will not increase the number of expected readings for the sentence.

We have seen that accounting for the interpretational restrictions in VP deaccenting cases is relatively straightforward given both the analysis of focus-related topics developed in the previous chapter and a sufficiently articulated theory of the interpretation of “referring” expressions like that discussed above. The account given can be summarized as follows. Interpretation of a sentence containing deaccented material is syntactically unconstrained. Hence, any syntactic ambiguities present in the non-deaccented counterpart of a sentence are also available for the deaccented sentence as far as the syntax is concerned. The felicity condition on focus-related topics, however, filters out most of these potential interpretations for the sentence by requiring that the focus-related topic of a sentence be instantiated in the local active context. The definition of instantiation is based upon the notion of identity, where the actual focus-related topic of a sentence will be instantiated in its local active context if and only if it is identical to a potential focus-related topic of some sentence contained in that context. This restriction ensures that the LF representation of the deaccented parts of a sentence will occur in some sentence in the active context. When this deaccented material can be assigned one of several distinct LF representations, the felicity condition on focus-related topics will have the effect of forcing the actual LF representation assigned to that material to be identical to that assigned to corresponding material in the context. This analysis accounts directly for ambiguity resolution in cases like (96c) since here there is a clear reason to want to allow both the superordinate clause and the subordinate clause to be associated with two distinct LF representations. I argued that the same analysis can be directly applied

to account for the restrictions on interpretation of (96d) as well by requiring that the values of the indices assigned to the referential elements contained in each of two phrases must be identical if the phrases themselves are to be identical. If the interpretation of indices were left unconstrained, this relativization of identity to index assignment would do little to restrict the possible readings of a deaccented sentence since it would always be possible for the relevant occurrences of NPs to be frivolously coindexed. However, under Heim's theory of index interpretation, such frivolous coindexing is largely eliminated by the requirement that each indexical value be given a unique interpretation. This puts a tight constraint on the range of interpretable LF representations, and hence restricts the range of possible input representations to the felicity condition on focus-related topics, which then acts to filter out most of these alternative interpretations. The uniqueness requirement on interpretation of indices and the felicity condition on focus-related topics thus act in tandem to restrict the range of readings available for sentences like (96). Having developed the above analysis of the restrictions on interpretation in deaccenting environments, the obvious next question to ask is whether this analysis can be used to account for the restrictions on interpretation in VP deletion cases as well. I turn to this question immediately.

3.3 Specifics of VP Ellipsis

The above account of the restrictions on interpretation found to hold in deaccenting environments was based on the premise that deaccenting of a phrase is only felicitous when an identical phrase occurs previously in the discourse, where identity is checked at the level of LF. The same basic account can be used to explain restrictions on interpretation in VP deletion environments as well by ensuring that a deleted VP will be identical with some antecedent VP at LF. This still leaves open the question of how to ensure that such identity obtains, allowing in principle for either a post S-structure copying based analysis along the lines of Williams (1977), or a PF deletion based analysis along the general lines of Sag (1976) (cf. chapter 1 for discussion). Under either approach the explanation for the near identical restrictions in the two classes of cases – those in deaccenting environments

and those in VP deletion environments – will be principled in that each will derive from identity restrictions. As we will see below, under a deletion based analysis it is possible to go further by reducing VP deletion to deaccenting. In this section, I will sketch two specific analyses of VP ellipsis, one of which will be a copying based analysis and the other of which will be a deletion based analysis. In developing these two alternative analyses, I am more concerned to show the commitments one is forced to make under either type of approach, and am not so much concerned with defending one approach over the other.

3.3.1 Copy Based Theories of VP Ellipsis

The main advantage of a copy based approach to generating lexical material at LF for VP ellipsis sentences is the simplification it affords in the PF component. Under a copy based approach, phonologically empty VPs are base generated as such, perhaps containing internal syntactic structure, but lacking any lexical material. The copy operation which supplies lexical material to these VPs is assumed to apply after phonological spellout, leaving the VP empty at the level of PF. Since the input to the PF component on this analysis contains no lexical material in the “elided” VP, there is no need for a deletion operation at this level, and hence there is no need to postulate PF constraints on VP ellipsis. All substantive issues relating to VP ellipsis on such an approach are restricted to those parts of the grammar responsible for determining the ultimate semantic interpretation of the elided VP. This leaves basically three questions to be answered: (i) what is the base generated structure of an empty VP?, (ii) where does copying apply?, and (iii) what gets copied? The questions are of course related, though they are at least partially independent of each other.

For the first question, there are essentially three possibilities to consider. The empty VP could be a pronominal-like element akin to *pro*, it could be an unstructured empty category, or it could be a fully structured VP with empty terminal elements. The first option appears to be highly unlikely. It is a well-known fact about VP ellipsis that an elided VP can “contain” the trace of a WH-expression which has been raised out of

the VP. This fact is illustrated in the following dialogue.

- (118) **A:** Who did John introduce to Mary?
B: I don't know. Who did PETER *e* ?

Overt pronouns, however, cannot contain WH-traces, as illustrated in (119). Furthermore, the most likely candidate for an overt pro-verbal element – *so* – likewise cannot contain a variable bound by a WH-expression, as illustrated in (120).

- (119) a. **A:** John introduced Bill to Mary.
B: PETER did it too.
b. **A:** Who did John introduce to Mary?
B: I don't know. *Who did PETER do it?

- (120) a. **A:** John introduced Bill to Mary.
B: PETER did so too.
b. **A:** Who did John introduce to Mary?
B: I don't know. *Who did PETER do so?

If empty VPs were pronominal-like elements, then the distinct behavior of empty VPs and of the overt pronominal-like elements in the above examples would be unexplainable. I take these examples to argue strongly against a pronominal-like analysis of empty VPs. This leaves two other options to be considered – unstructured empty VPs, or structured VPs with empty terminal elements.

Consider first the former alternative – that VPs are base generated as a single, unanalyzable empty element. Under such an analysis, the connection between a WH-phrase and its trace would only exist after the antecedent VP is copied into the empty position, which by assumption only occurs after phonological spellout (i.e. after S-structure). This means that the relation between a WH-expression and a trace contained in a copied VP cannot be established by movement of the WH-expression out of the VP prior to S-structure since there would be no possible source for the WH-expression to move out of.⁵ Such an analysis thus predicts that the effects of a constraint such as subjacency,

⁵Haik (1987) argues for an analysis of VP deletion in which an empty VP is treated as an unanalysed empty element. To account for subjacency effects, Haik assumes that such empty VPs can count

which is commonly taken to constrain D-structure to S-structure movement, should be able to be nullified in a VP ellipsis context. This prediction is not borne out, however, as can be seen in the following example.

- (121) A: Who did Bill call on the phone yesterday?
 B: I don't know. ??Who are people asking you whether he
 { did }
 { called on the phone } ?

The VP ellipsis example is no better than the corresponding example containing an overt VP, both examples exhibiting standard subjacency effects. The subjacency effects could be accounted for by forcing the WH-expression to be base generated in a position adjacent to the empty VP since then the WH-expression in (121B) would have to move across the intermediate Comp between D-structure and S-structure in the ellipsis case as well as in the overt case. However, it is difficult to see what motivation there could be for forcing the WH-expression to be base generated in that position in the first place, and without independent motivation, such an explanation would constitute little more than a restatement of the facts. Thus, while the existence of subjacency effects in VP ellipsis contexts does not constitute a knock-down argument against analyzing empty VPs as unanalyzable empty elements at D-structure, it does make such an analysis suspect.

We are left, then, with an analysis in which phonologically empty VPs have the complete syntactic structure of their overt counterparts, but with empty terminal nodes in place of lexical items. This is essentially the analysis adopted in Williams (1977). We can see immediately that the first of the above two problems is simply not an issue under this third analysis since there is no reason to expect a fully structured VP to act like a pronominal element. The second problem can also be avoided if we assume that the WH-expression in the VP ellipsis version of (121B) is base generated in the same structural position as it is in the non-deleted version. Since WH-movement in this case

essentially as WH traces with respect to S-structure constraints, but that at LF they are replaced by full-fledged VPs containing a true WH-trace which is used for assigning an interpretation to the phrase as a whole. While this analysis gives a technical solution to the problem of accounting for subjacency effects like those illustrated below in (121), it offers no principled restriction on the syntactic function of empty elements, in particular leaving unexplained why an empty VP can act syntactically as a WH trace when it is semantically nothing of the sort.

is obligatory, the WH-expression will have to raise out of the VP by S-structure, but such movement will violate subadjacency in both the VP ellipsis case and in the overt VP case. We thus expect the two examples to be identically ungrammatical, which is exactly what we found to be the case. Since this is the only one of the three alternative analyses originally considered which is readily compatible with the above facts, I will proceed on the assumption that under a copy based analysis of VP ellipsis, an elided VP must be represented at D-structure as having the complete internal syntactic structure of a normal overt VP, but with empty terminal nodes in place of lexical items.

We can move on now to the second of our three original questions; where does copying occur? In order for a copy based analysis of VP ellipsis to constitute a substantive alternative to a deletion based approach, copying must be a post-S-structure operation. This much we have already been assuming. However, we can further narrow down the range of possibilities by considering the interaction between VP ellipsis and sentences containing multiple WH-expressions like that in (122).

(122) I wish I knew who brought what to the party.

The first possibility one might consider for copying would be to allow copying to apply immediately to S-structure representations in the LF derivation of a sentence. Under such an analysis, what would be copied would presumably be another S-structure representation of a VP from the previous discourse context. Assuming (122) to be the source of the antecedent VP for such copying, this analysis would potentially result in the VP *brought what to the party* being copied. LF WH-movement would then apply to the WH-phrase in the copied VP just as in the antecedent VP, and thus we would expect the WH-expression in the VP ellipsis sentence to be able to function just as it does in the antecedent sentence. In the examples in (123) modeled after similar examples found in Hirschbüler (1982), however, we see that this prediction is not borne out.

(123) a. **A:** I wish I knew who brought what to the party.
 b. **B:** Me too. I have no IDEA { a. **who did e.*
 b. *who brought what (to the party).* }

The crucial example here is that of (123Ba). If copying applied at S-structure, then all else being equal we would expect this example to be identical to (123Bb). We find,

however, that the former is ungrammatical while the latter is perfectly acceptable. This distinction thus mitigates against allowing copying to apply to S-structure representations. If we assume that the copying operation applies at LF instead of at S-structure, the problem posed by (123) can be readily avoided. Since WH-expressions which are *in situ* at S-structure presumably raise at LF to a [+WH] Comp, the LF representation of the VP in (123A) will contain a trace in place of the WH-expression *what*. If we attempt to copy this VP directly into the empty VP of (123Ba), however, the resulting representation will be ill-formed, since the trace of *what* from the antecedent will be unbound in the copy. The distinction between the (a) and (b) examples in (123B) can thus be taken as evidence that copying must apply to LF representations. As we will see in the section 3.3.2 below, this conclusion is not a necessary one, though the explanation offered is the most straightforward way of handling the data.

In order for the explanation just given for the unacceptability of (123Ba) to go through, the ordering relation of LF WH raising before copying must be an obligatory one. The easiest way to ensure this ordering is to have copying apply to the output of LF. If we adopt this assumption, then the explanation of the ungrammaticality of (123Ba) leads to an interesting prediction with respect to quantified expressions in VP ellipsis contexts. The explanation implicitly assumes that the copying operation can only copy a VP, and not a WH expression which has been raised out of the VP. If we generalize from this case to other cases of LF raising such as Quantifier Raising, whenever some expression such as a Quantifier Phrase has been raised out of a VP, that VP should only be able to be copied into an empty VP which is within the scope of the raised QP. When copying is across sentences, of course, there is no possibility of the copied VP being within the scope of a quantifier from a preceding sentence. Consequently, the only way for the copy to be well-formed is if the QP in the antecedent VP does not raise out of the VP at LF prior to copying. If we take the scope of a QP to be its c-command domain at LF, then it follows that QPs in intersentential VP ellipsis contexts should never be able to have scope outside the copied VP which contains them at S-structure. Note that this prediction does not carry over to deaccenting cases, since deaccenting does not involve a copying operation. Indeed, the acceptability of the (b) example in (123B) indicates

clearly that the source of the unacceptability of the (a) example must derive from restrictions on copying which do not apply to deaccenting in general. Thus in examples containing deaccented QPs, any scope assignment should be possible as long as there is a suitable antecedent expression in the context in which the identical scope assignment is instantiated. Intuitions about such examples are unfortunately subtle, though I believe the expected distinction can be seen in examples with quantified expressions just as in multiple WH examples like those above. I give a relevant illustration in (124).

- (124) a. The doctor/lawyer conference was an abysmal failure. On the first day, some lawyer objected to every proposal.
b. Then on the SECOND day, some DOCTOR did.
c. Then on the SECOND day, some DOCTOR *objected to every proposal*.

It is fairly clear that a wide scope reading of the QP *every proposal* is possible in the deaccenting example in (c) provided that the corresponding QP in the second sentence of (a) is also given wide scope. With the example in (b), the facts are less clear, though the wide scope reading of the copied QP, if possible at all, is clearly less readily available than it is in (c). If such a reading is in fact unavailable in (b), then this example offers support to an analysis in which the copying operation applies to LF representations in which scope assignments have already been fixed. If such a reading is available, on the other hand, a copy based analysis would have to be significantly complicated in order to account for the distinction between these cases and the corresponding WH cases above.

I argued in chapter 1 that in order to give a principled account of the restrictions on interpretation present in both VP ellipsis cases and in VP deaccenting cases, the explanation for the two would have to be identical. Since it is impossible to explain restrictions in deaccenting cases in terms of restrictions on ellipsis, I argued that the explanation given for both cases would have to derive from restrictions on deaccenting instead. In the examples considered in this section, however, we have seen that the ellipsis cases are in fact more highly restricted than the deaccenting cases. I argued that the additional restrictions can be handled by assuming that copying applies to LF representations, and that the copying operation only copies material contained within a VP at that level. If this is correct, however, it would appear to undermine the reduction

of constraints on VP ellipsis to those on deaccenting. While treating copied VPs as deaccented will not lead to any incorrect predictions, if the LF representations that are copied are the same LF representations which are used to determine whether or not a given deaccented phrase is instantiated in a context, treating copied material as deaccented will not add any constraints to the interpretation of a deleted VP beyond those already implicitly imposed by the copying mechanism itself. That is, ambiguity resolution will in essence be secured redundantly by both the copying mechanism and by constraints on deaccenting.

Summarizing the results of this section, I have argued that under a copy based analysis of VP ellipsis, the D-structure representation of the empty VP must (be allowed to) have the full internal structure of its antecedent, differing from the antecedent only in that none of the [-WH] terminal nodes contains any lexical material. Copying can apply no earlier than S-structure, and we have some reason for believing that copying must apply after LF raising of WH expressions. The most natural way to enforce such an ordering is to only allow copying to apply to complete well-formed LF representations. The resulting analysis is by no means the only copy based analysis which has a potential for being adequate, and to the extent that alternative explanations can be given for the examples in this section, many other possibilities will undoubtedly present themselves. While a copy-based analysis of VP ellipsis may be acceptable from a technical standpoint, from a theoretical point of it makes the explanation for the constraints on interpretation in VP ellipsis contexts necessarily distinct from the explanation given for the corresponding constraints in VP deaccenting contexts. In both cases, the explanation is given in terms of identity between two expressions, though in the ellipsis case this identity is secured by the copying mechanism, while in the deaccenting case it is enforced by the felicity condition on focus related topics. The explanations are similar, but neither one can be reduced to the other. This is not so much an objection to a copy based theory of VP ellipsis as much as an observation about the form of explanation possible under such a theory.

3.3.2 Deletion Based Theories of VP Ellipsis

As mentioned above, the alternative to a copy based theory of VP ellipsis is a deletion based theory, i.e. one in which a phonologically null VP is base generated as a full lexical VP and gets deleted in the phonological component. The conditions under which deletion is possible are presumed to be identity conditions of a sort, and deletion is taken to apply after S-structure. Sag's (1976) analysis discussed in chapter 1 was one such theory. In distinction to a copy based analysis, under a deletion based analysis questions related to the derivation of LF representations are essentially orthogonal to questions of VP deletion. While constraints on deletion will determine a range of potential D-structures associated with any given VP ellipsis sentence, once the D-structure has been determined, the derivation of the corresponding LF representation is subject to no additional constraints beyond those needed for independent reasons in the grammar. Thus, a VP ellipsis sentence and its overt counterpart are predicted to behave identically with respect to the semantic component. Taken in one sense, this prediction is of course false. That is, if one takes the counterpart of a VP ellipsis sentence to be any sentence made up of the same words organized thematically into the same gross syntactic structure, then differences of interpretation will arise within a given context. The sentences with overt structure will have a far wider range of potential interpretations generable by varying the focus structure of the sentence. By taking the overt counterpart of a VP ellipsis sentence to be one which preserves focus structure as well as thematic organization, however, much of this discrepancy disappears. From this perspective, the analysis of focus-related topics from the previous chapter can be seen as laying the groundwork for making a deletion based analysis of VP ellipsis plausible.

If we adopt the structure of grammar assumed in the syntactic literature since the Extended Standard Theory in which Logical Form (LF) and Phonetic Form (PF) comprise two distinct branches of the grammar which interact only indirectly via the syntactic level of S-structure, a deletion based theory can be considered adequate only if all necessary constraints on deletion can be stated within the PF component. Thus, while syntactic features can be made use of, aspects of a derivation which are confined to the LF component of grammar are in principle inaccessible. Put differently, only those aspects of

interpretation which are visible at S-structure in the syntax can possibly play a role in constraining deletion in the phonological component. This is an important restriction to keep in mind, especially in light of the fact that the most detailed deletion based analysis of VP ellipsis in the literature – the analysis of Sag (1976) – directly violates this restriction by allowing deletion to be constrained by identity of interpretation. Of course, it might be that the organization of the grammar standardly assumed is incorrect, and that it is in fact necessary to allow the PF component to have direct access to the LF component. Unless such a reorganization of the grammar is absolutely forced upon us, however, on general methodological principles it should be avoided.

The most important question which a deletion based analysis of VP ellipsis must address is under what conditions deletion is possible. Given an independent need to represent deaccenting in syntax, the simplest answer one can envision is that deletion is possible whenever deaccenting is possible, i.e. that VP ellipsis is no more than an extreme case of deaccenting where a VP ceases to be audible altogether. Prima facie examples seem to argue against such an approach, however, since there are clear cases in which a VP can be deaccented but where the interpretations available for the resulting sentence are not available for the corresponding VP ellipsis sentence. A modified version of the examples in (97a,c) discussed at the outset of this chapter illustrates this point.

- (97) a. John likes soaring gliders because BILL does.
 c. John likes soaring gliders because BILL *likes flying aircraft*.

Whatever other similarities there are in the interpretations of these two sentences, they clearly do not share an interpretation. However, if all deaccented VPs were allowed to be deleted, then we would expect that the D-structure representation underlying (97c) could also serve as the underlying representation for (97a), and the two sentences would consequently be expected to share an interpretation.

The problem posed by (97a,c) above can be avoided if in addition to requiring that a deleted VP be deaccented we further assume that a deleted VP must be composed of the same lexical items as some antecedent VP in the context. On such an assumption, the D-structure representation of (97c) would not meet the conditions for deletion. Consequently, there would be no well-formed derivation with the D-structure representation of

(97c) and the PF representation of (97a), and the absence of a shared reading between the two sentences would thus be explained. While such an analysis goes a long way toward accounting for when VP ellipsis is possible and for what interpretations are available for a sentence containing a deleted VP, there is a class of examples which cannot be handled under this analysis as it stands, and which in fact pose a serious challenge to any deletion based analysis of VP ellipsis. The type of problem I am referring to is a subclass of cases in which a single quantified expression is interpreted as binding two variables – one in an overt VP and one in a deleted VP. I illustrate below.

- (126) a. The teacher spoke with each student before the principal did.
 b. $\forall x : student(x)$ The teacher spoke with x before $\forall y : student(y)$ the principal spoke with y .
 c. $\forall x : student(x)$ The teacher spoke with x before the principal spoke with x

I assume that the sentence in (a) is ambiguous between the readings in (b) and (c), though this assumption is not important. What is important is the availability of the interpretation in (c). Under this interpretation, all that is required for the sentence in (a) to be true is that for each individual student a , the teacher spoke with a before the principal spoke with a . If such an interpretation is in fact available for this sentence, then this sentence stands as a counterexample to the analysis under consideration. According to this analysis, deletion of a VP at PF is possible only when the VP and its antecedent are lexically identical. Since quantifier raising does not occur prior to S-structure in English, this means that the only potential source for the sentence in (a) should be that given in (127) below.

- (127) The teacher spoke with each student before the principal spoke with each student.

The problem is that this sentence does not have (126c) as a possible interpretation. If the D-structure representation of (127) is the only possible source for VP ellipsis sentence in (126a) as the analysis predicts, then, the availability of the interpretation in (126c) for this latter sentence cannot be explained.

If (126a) is to be handled by a deletion based theory of VP ellipsis, then a D-structure representation like that of the following sentence will have to be admitted as a potential

source for (126a).⁶

- (128) The teacher spoke with each student before the principal spoke with him/that student.

While such a D-structure will clearly allow for deaccenting of the subordinate VP on a reading in which the pronoun is bound by the quantified expression at LF, the superordinate and subordinate VPs are obviously not lexically identical at PF. The challenge for a deletion based theory of VP ellipsis is then to state the conditions for deletion so that the PF representation of the subordinate VP in (128) meets these conditions in the context of the superordinate VP.

It was cases like this which led Sag (1976) to import a semantic identity condition into the theory of VP ellipsis. I have argued above, however, that no adequate deletion based analysis of VP ellipsis can make essential use of purely semantic information of the sort which Sag employs.⁷ To allow (128) as a D-structure source for the sentence in (126a), we clearly have to abandon the notion that VP ellipsis requires lexical identity with an antecedent at PF in favor of some looser restriction. Suppose, then, that we allow deletion of a VP when that VP is *non-distinct* from its antecedent, in some sense to be made precise. Such an analysis can be made to handle the problematic case under consideration provided either that we analyze *each* as non-distinct from *that*, or that we analyze *each student* as non-distinct from *him* at PF.

Given the above analysis of index assignment and interpretation based on Heim (1992), there is an obvious solution to the problem of defining non-distinctness. Assume for the sake of argument that the underlying representation of the VP ellipsis sentence in (126a) contains a pronoun in the subordinate clause. According to the above analysis, indices are assigned to all definite NPs and quantified expressions by the level of S-structure. If we assume that the QP *each student* is assigned an external index, in

⁶One could equally well conceive of a D-structure source for (126a) which contained a base generated empty category in place of the pronoun, though I will ignore this possibility.

⁷Recall from chapter 1 that Sag's allowed VP ellipsis to apply under identity up to the point of alphabetic variance. This constraint will only be satisfied for sentences like (128) at the level of LF, since it is only at this point that the quantified expression raises and binds a variable left behind in its D-structure position, hence the essential use of purely semantic information.

order for the sentence to be interpreted in such a way that the QP binds the pronoun, this outer index of the QP will have to be identical to the inner index of the pronoun, as illustrated below.

(129) The teacher spoke with [each student]₁ before the principal spoke with [him₁].

If we analyze distinct elements bearing occurrences of the same index as non-distinct, then allowing for deletion to apply to the sentence in (126a) under the assignment of indices given in (129) will be unproblematic. The only change that is required is to allow identity of index value not to care about the position of the index. If we assume that an element can only be bound by a quantified expression if it is in the scope (c-command domain) of that quantified expression at LF, then in order for this S-structure representation to be mapped onto a well-formed LF representation, the quantified expression will have to raise to a position where it binds the pronoun. Ignoring irrelevant details, the LF representation for this sentence will then be the following.⁸

(130) [each student]₁ [The teacher spoke with t₁ before the principal spoke with [him₁]]

By treating the two VPs in question as non-distinct at PF, it is thus possible to give an explanation of the formerly problematic interpretation of (126a).

There is still one major problem which a deletion based analysis of VP ellipsis must face, and that is the problem of deletion of WH expressions in multiple WH sentences like that of (124), repeated here.

(124) a. A: I wish I knew who brought what to the party.
 b. B: I wish I did too. I have no IDEA { a. **who did e.*
 b. *who brought what (to the party).* }

This example was used in section 3.3.1 to argue that under a copy based analysis of VP ellipsis, copying must apply after LF WH raising. It was assumed that if copying applied at S-structure to (124Ba), the resulting representation would be indistinguishable from that of (124Bb) and hence once copying applied there could be no way of teasing the two

⁸Incorporated into this representation is Higginbotham's (1983) assumption that linking is automatic under movement.

examples apart. On a deletion based analysis of VP ellipsis, however, the two sentences in (124B) would presumably derive from the same D-structure representation and would hence have identical LF representations and interpretations. In order to account for the unacceptability of the ellipsis example in (124Ba), a deletion based theory must be able to block deletion from applying altogether to the embedded VP of (124Bb). Since on the surface the deleted VP and its antecedent appear to be identical, however, blocking deletion from applying here is an enormous challenge to any deletion based theory.

The first approach one might consider for blocking deletion from applying in the above case is to stipulate that WH expressions are obligatorily focused even when they do not appear to bear phonological accent. Under such an analysis, the embedded VP *bought what (to the party)* could not be analyzed as a deaccented constituent since it contains a focused element, and hence we would not expect it to be able to delete. The problem with such an approach is that it leaves the first sentence in (124B) – *I wish I did [e] too* – a complete mystery. The source for this sentence contains two WH expressions, both of which get deleted. Under the proposed analysis, then, we would expect this sentence to be as bad as or worse than (124Ba), and yet this sentence is impeccable.

The only way I can see of altering the conditions on deletion so as to make the required distinctions for the case just considered is to not allow deletion to break up relations between *in situ* WH expressions and the Comp they raise to at LF. Stating this requirement purely within the PF component, however, is not a trivial task. The first thing that is required in order for such an analysis to be possible is that an *in situ* WH expression must be directly related (no later than) at S-structure to the Comp to which it raises at LF. To describe this relation, I will say that a WH expression is *bound* by the Comp to which it eventually raises, leaving the representation of this binding relation unspecified. Next, we have to relativize the notion of non-distinctness to this relation in such a way that a VP containing a WH expression which is unbound within that VP can never qualify as non-distinct from another VP, while one containing only WH expressions which are bound within the VP can. Finally, we have to make sure that the resulting definition of non-distinctness applies only to overt WH expressions and not to their traces, since as we have already seen in (119) (repeated here) VP ellipsis is perfectly

acceptable in sentences in which the deleted VP contains a WH trace.

- (119) a. **A:** Who did John introduce to Mary?
b. **B:** I don't know. Who did PETER?

A definition of non-distinctness which meets these requirements is given below.

- (131) Two expressions α and β are **non-distinct** at PF if and only if:
- i. α and β are *similar*, and
 - ii. if γ is a WH expression occurring in α and γ' the corresponding WH expression occurring in β , γ and γ' must be bound within α and β respectively.
- α and β are **similar** if and only if
- i. α and β are lexical elements and $\alpha = \beta$, or
 - ii. $\alpha = [\gamma_i]_j$ and $\beta = [\delta_k]_l$ (i, j, k, l optional), and $\{i, j\} \cap \{k, l\} \neq \emptyset$, or
 - iii. the immediate constituent structure of α is syntactically identical to that of β and each subconstituent of α is non-distinct from the corresponding subconstituent of β .

I leave the notion of two expressions *corresponding* as well as that of their being *identically bound* unformalized here. In rough outline, I take correspondence to be a relation between positions within syntactic constituents, where it is a minimal requirement for two positions to correspond that they be of the same syntactic category and that the sets of syntactic constituents they are contained in be identical.

The definition of non-distinctness given above can be seen as a minimal specification of the constraints required in order to make a deletion analysis of VP ellipsis based on PF constraints possible. The definition may require further refinements, but no aspect of the definition can be eliminated without sacrificing empirical coverage. The definition is undeniably stipulatory at this point, though I do not currently see a way of giving a more principled deletion based account of VP ellipsis.

One final potential problem for a deletion based analysis should be noted. In the previous section, I argued that the scopal possibilities of quantified expressions differed depending on whether or not the QP was contained in a VP which was deleted or in one which was deaccented. There I argued that a deaccented QP can clearly have scope outside a deaccented VP which contains it, while it is less clear whether a deleted QP

can have scope outside the elided VP it is contained in (at D-structure). The relevant examples are repeated here.

- (125) a. The doctor/lawyer conference was an abysmal failure. On the first day, some lawyer objected to every proposal.
b. Then on the SECOND day, some DOCTOR did.
c. Then on the SECOND day, some DOCTOR *objected to every proposal*.

Examples of this sort are crucial to determining whether VP ellipsis should be handled as deletion or as copying. If quantifier scope possibilities are more highly restricted in the VP ellipsis example than in the deaccenting example, then a deletion based account will be hard pressed to account for these facts. The only way to do so would be to represent quantifier scope at S-structure, and only allow deletion to apply when the scope of a quantified expression is within the deleted VP. If on the other hand the quantifier scope possibilities are identical for these two examples, i.e. if a wide scope reading of the QP *every proposal* is available in (125b) just as it is in (125c), then a deletion based analysis will have an advantage over a copy based analysis, since the unavailability of such an interpretation was predicted under a copy based analysis in the previous section. It is lamentable that judgments in these cases are so murky. If clearer examples cannot be produced, it may prove impossible to give a clear argument which distinguishes empirically between a deletion based analysis and a copy based analysis of VP ellipsis.

Summarizing the results of this section, I have argued first and foremost that in order for a deletion based analysis of VP ellipsis to be acceptable, any constraints on deletion must be storable entirely within the PF component of the grammar. I argued that two basic constraints will suffice to account for the majority of cases of VP ellipsis – that the deleted VP must be deaccented and that it must be lexically identical to some antecedent VP. This account had to be modified in two ways, however, first to account for certain cases of VP ellipsis in which the deleted VP contains a variable bound from outside that VP and second to account for cases in which the deleted VP contains a WH expression. To handle the first set of cases, I assumed that the deleted VP is base generated with a pronoun in the position of the bound variable. I then redefined

the conditions under which VP ellipsis can apply so as to require non-distinctness of a deleted VP with its antecedent rather than identity, where non-distinctness in the case of two indexed expressions depends only on one of the values of the indices assigned to each expression being identical. To handle the second set of cases, I stipulated that deletion cannot apply to a VP containing a WH expression unless that VP also contains the Comp which binds the WH expression. The need for this last stipulation is a clear drawback to a deletion based analysis of VP ellipsis. However, on the conceptual side, under a deletion based analysis, the connection between the restrictions on VP ellipsis and those on deaccenting examined in chapter 1 is a principled one – deaccenting is seen as a precondition to deletion, and consequently all restrictions on deaccenting automatically carry over to VP ellipsis sentences.

3.3.3 Alternate Deletion-Based Analysis

The above deletion-based analysis of VP ellipsis was based on the assumption that deletion must be directly constrained by some kind of identity criterion at PF. The analysis given, however, overlooks one crucial problem. In discussing cases of deaccenting, I argued that it had to be possible to augment the active context via a process akin to accommodation in order to license the focus-related topic of sentences such as (97c) above (repeated here).

- (97) a. John likes soaring gliders because BILL does.
 c. John likes soaring gliders because BILL *likes flying aircraft*.

The reason it is necessary to accommodate a proposition into the context in (97c) is that the definition of instantiation is based on identity, and there is no sentence in the context at the point where the subordinate clause is processed which contains the necessary identical material. In order to account for the absence of an identical reading between these two examples, I outlined above an account of VP deletion based on identity at PF, the idea being that a sentence whose underlying representation was that of (97c) would not contain an antecedent VP identical to the VP to be deleted, and hence deletion would be blocked. However, we must now ask why it isn't possible to accommodate a

proposition into the context which will satisfy the PF identity requirement, just as we had to accommodate a proposition into the context to satisfy an identity requirement to license the deaccenting in (97c). Unless we can give a reason why such accommodation should be disallowed, the above deletion-based analysis will not be able to provide an explanation for why the sentences in (97a,c) fail to share an interpretation, and the analysis itself will consequently be called into question. In this section, I propose an explanation for why such accommodation will not generally be possible for VP ellipsis sentences, an explanation which takes as given only the constraints on deaccenting argued for in chapter 2. Having given such an explanation, I will then show that PF identity constraints like those outlined in the preceding section can be dispensed with altogether. The resulting analysis will then constitute a true reduction of constraints on VP deletion to those on deaccenting.

Once a VP ellipsis sentence is determined to have a particular D-structure representation, there is no way to prevent generation of an implicature of the form needed to license deaccenting and consequent deletion of that VP. To explain the interpretational differences between sentences like those in (97a,c) above, then, we have to show that the former sentence cannot be determined to have the same D-structure representation as the latter. If all that were at issue were syntactic well-formedness, one could simply stipulate that the D-structure representation had the required form and we would be forced to abandon the deletion-as-deaccenting analysis without giving it further consideration. However, we are concerned here not only with syntactic well-formedness, but with discourse felicity as well, where part of what goes into determining whether a discourse is felicitous is whether what the discourse participants have intended to convey can reasonably well be figured out. It is this fact that I intend to use to explain the differences noted above.

In assigning an interpretation to a sentence like (97a), the only clues one has to go on are contextual clues and knowledge of grammar. By assumption, the contextual clues available to help in assigning an interpretation to this sentence are restricted to those present in the sentence itself. As for one's knowledge of grammar, I take it to be part of a native English speakers knowledge of grammar that the focus-related topic of a sentence

must be instantiated in a context. This knowledge can thus be exploited in determining the interpretation of the sentence in (97a). Being faced with an utterance of (97a), then, one could plausibly figure out the intended interpretation by reasoning as follows. The speaker uttered (97a) without giving any clues outside his utterance what interpretation (and hence what D-structure representation) he intended. Since he and I both know that VPs can be deleted if and only if they can be deaccented, and VPs can be deaccented only if their LF representations are instantiated in the context, his intended meaning must be one with an LF representation which is instantiated in the active context. Since the only LF representation contained in the active context is that of the superordinate clause, the speaker must have intended the interpretation of the elided VP to be identical to that of one of the VPs in the superordinate clause. Since the superordinate clause contains two VPs – *soaring gliders* and *likes PRO soaring gliders* – I have to make a guess from here as to which VP the speaker intended me to choose, though since the choice comes down to one of two it should be relatively simple to determine which the speaker intends. The above reasoning process is somewhat abbreviated, but it is precise enough for our present purposes.

Suppose now that we were to try and determine whether the speaker might have intended some different interpretation for the elided VP – say the interpretation *likes flying aircraft*. How could we determine this to be so? The reasoning would have to go something like this. The speaker uttered (97a) without giving any clues outside his utterance what interpretation (and hence what D-structure representation) he intended. Since he and I both know that VPs can be deleted if and only if they can be deaccented, and VPs can be deaccented only if their LF representations are instantiated in the context, his intended meaning must either be one with an LF representation which is already instantiated in the context, or one based on which I can calculate an implicature which will instantiate it. If I assume the speaker intends the interpretation to be *likes flying aircraft*, then I can calculate such an implicature in the manner illustrated in section 3.2.1. However, the same is true if I assume that he intends the interpretation to be *likes objects*, *has desires*, *is not averse to flying*, or any of a large (perhaps infinite) number of other expressions. The only way I could possibly choose a single interpretation from

among these myriad possibilities would be for the speaker to further specify the exact interpretation intended. Since he is capable of going through this same reasoning process, if this were the reasoning process he intended me to go through, then he would know that I would be incapable of figuring out his intended meaning without his specifying that exact meaning, and would thus be violating the maxim of Quantity by using the VP deletion sentence in question. Since I have no reason to assume that he is violating this maxim, the speaker must be assuming that his utterance is sufficient for me to determine his intended meaning, and hence that the reasoning process I will use to do so will not be that outlined above. Since the reasoning process outlined in the preceding paragraph is simpler, and since it allows me to identify a particular interpretation as that intended by the speaker, blocking the reasoning process in the current paragraph is unproblematic.

If we generalize from the above explanation of the unavailability of (97c) as an interpretation for (97a), we conclude that the only LF representation we can assign to an elided VP will be one which is already directly instantiated in the local active context. That is, the interpretation assigned to an elided VP can never be one which requires that some further sentence be accommodated into the context in order for the VP ellipsis sentence to be felicitous. This conclusion is undoubtedly a bit too extreme, though for the types of cases we have been considering it is not unreasonable. The literature is scattered with examples in which VP deletion is claimed to be possible when there is no syntactic VP in the context with which the elided VP could be identical, cases of passive VP antecedents for active deleted VPs or other similar mismatches. I find none of the examples particularly convincing as grammatical instances of VP ellipsis, although in each of the examples it is possible to determine a unique most likely intended interpretation for the elided VP, which on the present analysis could only be generated via accommodation. Rather than block accommodation altogether, then, it would be better to only allow accommodation when no other means of determining a potential interpretation would be possible. I will not go into the details of this distinction at this point, though it is clear that such an explanation will have to be given in order for the analysis of this section to be plausible. Rather, I will stick to the simpler characterization of the solution according to which VP deletion sentences simply cannot induce accommodation.

The challenge posed by the examples originally considered in (97a,c) was to explain the lack of any shared interpretation for the two sentences. The analysis of section 3.3.2 above could only give such an explanation if it could be assumed that accommodation were possible in (97c) but impossible in (97a). I have just given some reason to expect this to be the case. Having done so, however, it turns out that much of the original motivation for adopting PF constraints on deletion disappears. These constraints were posited to account for the fact that interpretational possibilities for VP ellipsis sentences are a subset of the collection of interpretational possibilities for well-formed sentences containing a deaccented VP in place of the elided VP. The above analysis just provided an explanation for this very fact, however, by showing that only when an elided VP is identical to some VP in the context will it (in general) be possible to determine a unique interpretation for a VP ellipsis sentence. The analysis forces identity of interpretation without having to directly constrain deletion.

3.4 Pronominal Interpretation Revisited

In each of the two analyses of VP ellipsis just outlined, the explanation for restrictions on interpretation in VP ellipsis environments is dependent upon an elided VP having to be identical with some antecedently occurring VP. Under a copy based analysis of VP ellipsis, this identity comes about directly via the copy operation which supplies the material to the VP directly from some antecedent. Under a deletion based analysis as well identity is enforced, although the way in which it is enforced is more indirect. In order for a VP to be deleted it must be deaccented as well, and a VP can only be deaccented if that identical VP occurs in the active context (a restriction which follows from the definition of instantiation). The fact that an elided VP must be identical to some antecedent VP under both approaches makes it possible to consider analyses of pronominal interpretation abstracting away from the particulars of the analysis of VP ellipsis assumed. In section 3.2.2, I outlined an analysis of indexing and interpretation of indices based on the theory of Heim (1992), and I showed how this analysis can be used to account for the interpretational possibilities of one fairly basic example. In this

section, I turn to consideration of a wider range of cases of pronominal interpretation within VP ellipsis and VP deaccenting environments considered in the literature, and I show that the analysis adopted above gives the desired results in all of these cases. In the process, I will compare the above analysis to two other competing analyses, that of Fiengo and May (1991), and that of Kitagawa (1991). Finally, I turn to consideration of certain cases which are problematic for the analysis.

3.4.1 Eliminative Puzzles

Fiengo and May (1991) discuss a wide range of cases of pronominal interpretation in ellipsis contexts which they group under the heading *Eliminative Puzzles of Ellipsis*. The label is meant to suggest that VP ellipsis is somehow responsible for eliminating interpretations of a sentence which are available for its non-deleted counterpart, a view very close to that arrived at above. The solution they offer for the problems is also in many ways similar to the general solution I presented above, although there are some important differences. The most striking difference between their approach and that advocated here lies in the characterization of identity that they assume. In the analysis sketched above, identity of two expressions can be determined locally simply by comparing the expressions in question. For an analysis of VP ellipsis, this means that the licensing conditions for deletion (or alternatively the conditions under which reconstruction is possible) need only look at the internal structure of the VP in question. Fiengo and May, on the other hand, argue that when a VP contains a pronoun which is formally dependent on another element in the sentence, identity can only be established by taking into consideration the binder of the pronoun. To facilitate discussion, I give a brief comparison of the analysis of Fiengo and May and that developed above based on Heim (1992).

On the analysis developed above, there are two distinct interpretations available for indices. An index can either be free or it can be bound. In the former case the index is associated with a unique guise which determines a referent in a given world of evaluation, and in the latter case it is treated as a variable ranging over such guises. Fiengo and May make this same distinction in terms of types of occurrences of indices. An α -occurrence of an index under their analysis is equivalent to a free occurrence of an index under

the above analysis, while a β -occurrence of an index under their analysis corresponds to a bound occurrence of an index. In developing the above analysis, I argued that all occurrences of a single index must be of the same type – either all free (hence all designating the same unique guise), or all bound (hence all designating the same variable over guises). I further argued that identity is sensitive to index value. From this, it followed that the occurrence of a pronoun in an elided VP and that of a pronoun in an antecedent VP must be of the same type in order for the two VPs to be identical. Fiengo and May make a similar restriction on VP identity by requiring that the type of index on two pronouns contained in separate VPs must be the same in order for the two VPs to count as identical. However, at this point their analysis diverges from that expounded above. If the pronouns each bear an α -occurrence of an index, then each index is required to have the same value in order for the two VPs to count as identical. If they bear β -occurrences of an index, however, identity of indexical value is not required. Rather, what is required is that the two pronouns enter into identical dependencies. Without going into too many technical details, two dependency relations \mathcal{F} and \mathcal{G} are analyzed as being identical if and only if there is some structural description containing both the dependent element and antecedent in \mathcal{F} which is identical to a structural description which contains both the dependent element and antecedent in \mathcal{G} , where a structural description is taken in the standard sense “as an n -ary linear factorization, $\langle category_1, category_2, \dots, category_n \rangle$, of a structure S , in the sense defined in Chomsky (1955).” If two VPs contain pronouns with β -occurrences of an index, and if the antecedents of these pronouns are outside the VPs in question, it follows that identity between the two VPs cannot be determined strictly by looking at the VPs alone. With this much as background, I turn to consideration of data which Fiengo and May offer in support of their analysis, the eliminative puzzles.

The first such example that Fiengo and May consider is one which they identify as the *Multiple Pronouns Puzzle*. The example they consider is the following.

(132) Max said he saw his mother and Oscar did too.

The claim they make regarding this sentence is that under an interpretation in which

each of the overt pronouns is dependent on *Max*, the sentence is verified only by the situations in (133a-c), and not by that in (133d).⁹

- (133) Max said Max saw Max's mother and
- a. Oscar said Max saw Max's mother too.
 - b. Oscar said Oscar saw Oscar's mother too.
 - c. Oscar said Oscar saw Max's mother too.
 - d. Oscar said Max saw Oscar's mother too.

They show that these facts are a natural consequence of their analysis of pronominal interpretation and restrictions on VP ellipsis. As mentioned above, VP ellipsis is only possible under their analysis if the VP in question is identical in relevant respects to its antecedent. The readings indicated in (133a-c) are thus predicted to be available only if the VPs of the sentences which give rise to these interpretations are identical. The only candidate representations for this sentence which have a possibility of satisfying this restriction are the following. (Recall that α -occurrences in Fiengo and May's analysis are treated like free indices under the above analysis, and β -occurrences are treated like bound indices.)

- (134) a. Max_1^α said he_1^α saw his_1^α mother and Oscar_2^α said he_1^α saw his_1^α mother too
- b. Max_1^α said he_1^β saw his_1^β mother and Oscar_2^α said he_2^β saw his_2^β mother too
- c. Max_1^α said he_1^β saw his_1^α mother and Oscar_2^α said he_2^β saw his_1^α mother too
- d. Max_1^α said he_1^α saw his_1^β mother and Oscar_2^α said he_1^α saw his_2^β mother too

In (134a-c), the VPs in question come out as identical in all relevant respects. In (134d), however, they do not. In (134a), the identity between the VPs is obvious, and hence needs no comment. In (134b), the dependencies involving the pronouns in the two VPs

⁹As earlier, I use the notion of *verification by a situation* to identify potential interpretations of a sentence. The basic idea behind this view is that in order for a situation to verify a sentence under a given interpretation, the fact that the situation obtains must be sufficient evidence for determining that the sentence is true under that interpretation. It is of course more appropriate to consider the situations as situation types, in which the names used are thought of as guises which denote individuals in a world of evaluation rather than as actual individuals, and to replace verification by a situation with *verifiability by a situation type* where a sentence under a given interpretation is verifiable by a situation type if and only if for every assignment of individuals to guises, the sentence is true under that assignment whenever the situation in question obtains in the world of evaluation. I'll avoid this complication in the discussion, though I take it to be a necessary way of looking at the notion of potential interpretation.

are identical, so these VPs too will count as identical. (134c) is simply a mixture of the two cases just considered. The first pronoun has a β -occurrence of an index so the dependency relation it enters into must be identical in each of the two VPs, as it is, while the second pronoun has an α -occurrence of an index and so must have the same indexical value in both VPs, a condition which is again satisfied. These two VPs are thus also determined to be identical under Fiengo and May's analysis. (134d) is similar to (134c) in many respects, with one crucial difference. In the second VP in (134d), the pronoun with the β -occurrence of an index is dependent on the subject NP *Oscar*, which is two clauses up, while in the first VP it is dependent on the pronoun *he* which is only one clause up. This difference, Fiengo and May argue, is sufficient to block the two VPs as being analyzed as identical. Furthermore, there is no other representation of the two VPs which will have the intended interpretation and in which the two VPs will come out as identical, and so the lack of a reading indicated in (133d) is explained.¹⁰

If we adopt Fiengo and May's rendering of the facts, then some explanation along the lines they give will be necessary. In particular, it will probably be necessary to make reference to identity of dependency relations to explain the data. However, I find their assumptions regarding the interpretational possibilities of (132) highly suspect. There can be no question that it is difficult to interpret a person who utters (132) out of the blue as having intended to convey a proposition which would be verified by the situation described in (133d). However, the question of whether the sentence has such an interpretation is a separate issue. As I did earlier, I assume here that contextual information can help to disambiguate a sentence but cannot supply an otherwise unavailable interpretation to that sentence. By adopting this assumption, we can show that this fourth interpretation is possible by showing a situation in which such an interpretation is readily available. To illustrate this, I will use a sentence which is minimally different from that given in (132), although the changes are irrelevant to the predictions of Fiengo and May's analysis as well as here. Consider, then, the following situation. On Sunday at noon, a jewelry store is robbed, and the burglar gets away. On Monday, Max gets brought into

¹⁰I am ignoring many details of Fiengo and Mays analysis here. The reader interested in these details is urged to look at Fiengo and May (1991), especially chapters 2 through 4.

the police station as a suspect in the robbery, where he is questioned by a detective. During the questioning, Max protests to the detective, “I couldn’t have committed the robbery because I was with my mother at the time the robbery occurred.” That same day, Max’s friend Oscar hears that Max was arrested for the crime and decides to try to help him out by giving Max an alibi. As fate would have it, the alibi Oscar chooses to give for Max is that Max was with his (Oscar’s) mother at the time the robbery occurred. The detective finds the situation fairly amusing and tells his colleagues the story. To show that he has understood the situation, one of the colleagues offers the following as a summary of the story.

(135) (So,) Max said he was with his mother (at the time of the robbery) and Oscar did too.

In the situation described, the interpretation one would naturally assign to (135) is parallel to the suspect fourth reading of (132) given in (133d) above. Since the only differences between (135) and (132) are irrelevant to the interpretation of the pronouns contained in these examples, we can conclude that in (132) as well the suspect fourth interpretation is possible. The facts in need of explanation are thus different from what Fiengo and May took them to be, and consequently the explanation give for them will have to differ. Rather than try to modify Fiengo and May’s analysis, I will give such an explanation in terms of the analysis developed earlier in this chapter.

Given the possibility of the four readings indicated in (133), it should be readily apparent how to account for them within the assumptions of the analysis developed above. I give the LF representations below which will produce the relevant interpretations.

- (136) a. [Max₁] said [he₁] saw [his₁] mother and [Oscar₃] said [he₁] saw [his₁] mother too
 b. [Max₁]₂ said [he₂] saw [his₂] mother and [Oscar₃]₂ said [he₂] saw [his₂] mother too
 c. [Max₁]₂ said [he₂] saw [his₁] mother and [Oscar₃]₂ said [he₂] saw [his₁] mother too
 d. [Max₁]₂ said [he₁] saw [his₂] mother and [Oscar₃]₂ said [he₁] saw [his₂] mother too

In each of these LF representations, the VPs of the first and second conjuncts are straightforwardly identical. In (136a), each of the pronouns in the first conjunct is free, but each is assigned the same index as *Max*. Since distinct occurrences of the same index are all assigned the same unique guise, and since guises determine unique referents in any given world of evaluation, all three expressions will be necessarily coreferent. Furthermore, the pronouns in the elided VP must bear the same index, either in order to satisfy the felicity condition on focus-related topics, or because they derive from a copying procedure. Since no index can serve simultaneously as a unique guise and as a bound variable, the occurrences of the pronouns in the elided VP will not be allowed to be bound, leaving the representation of the second conjunct in (136a) as the only possible representation compatible with that of the first conjunct. In all of the other examples as well, the LF representation given for the second conjunct is the only one possible given the LF representation of the first conjunct. Since there are no other non-redundant LF representations of the first conjunct which will force coreference between *Max* and the two pronouns, the analysis adopted here predicts that all and only the readings indicated in (133) should be available for this sentence.¹¹

The second puzzle Fiengo and May mention is the *Dahl Puzzle*, attributed to Dahl (1972). This puzzle revolves around the readings available for the following sentence.

(137) Max thinks he's strong, Oscar does too, but his father doesn't.

Again, the interpretations to consider are those in which *he* in the first conjunct is taken to be *Max*.¹² What Dahl noticed is that when the second conjunct is given a sloppy interpretation (= *Oscar thinks Oscar's strong*), the third conjunct can be given a strict reading with respect to the second conjunct, provided that the pronoun *his* is understood

¹¹Actually, there are several more representations to be considered in which one or both of the pronouns in the relevant VP has been raised at LF via QR. While this possibility makes available a whole host of other legitimate LF representations, in each the indices on the pronouns will be identical to what they are in one of the four representations given in (136), and hence these additional LF representations will not introduce truth-conditionally distinct readings, as the reader can verify.

¹²On any other interpretation of the pronoun, the only possible readings for the sentence will be across the boards strict readings, where the interpretation of the pronoun *his* in the third conjunct is unconstrained. This is exactly what is predicted under the present analysis since the index of the pronouns in the deleted VPs of the second and third conjuncts would be identical to that in the first, and hence all three would be associated with the same unique guise.

as identical to *Oscar*. That is, the third clause can be interpreted as (roughly) *Oscar's father doesn't think Oscar's strong*. Fiengo and May show how this interpretation can be captured under their analysis by assuming that the pronoun in the elided VP has a β -occurrence of an index. The analysis they give associates the sentence in (137) with the LF representation in (138).

(138) Max_1 thinks he_1^β is strong, Oscar_2 thinks he_2^β is strong too, but his_2^α father₃ doesn't think he_2^β is strong

Here, the VP of the second conjunct is identical to that of the first since the dependencies involving the pronouns are identical. The pronoun in the third conjunct, however, is not in a dependency identical to that of any of the other pronouns in the sentence, and so it would appear that it should not be possible to associate this LF representation with the VP deletion sentence in (137). Fiengo and May permit such an association, however, by positing an additional licensing condition for β -occurrences of an index predicated on identity of indexical value. Since the value of the index of the pronoun in the VP of the third conjunct is identical to that of the pronoun in the second conjunct, and the two VPs are otherwise identical, by this additional licensing condition the second conjunct will license the ellipsis of the VP in the third. The pronoun in the third conjunct, however, also has to be in a dependency relation in order to be interpretable, and the NP *Oscar* is too far away to count as a licensing antecedent.¹³ There are two possible antecedents for this pronoun, however, namely the pronoun *his* and the NP *his father*. By choosing *his* as the antecedent for the elided pronoun, we derive the LF representation given in (138), which gives the reading Dahl observed to be possible. If we were to choose *his father* as the antecedent for the pronoun, the LF representation of the sentence would again be well-formed, though the interpretation associated with this representation would be inherently contradictory.

At a fairly high level of abstraction, the account of the facts under the above analysis is roughly identical to that given by Fiengo and May. However, because of the differences

¹³Fiengo and May assume that an element in a syntactic position p can be the licensing antecedent for a pronoun with a β -occurrence of an index only if a quantified expression in the position p could bind the pronoun. Since quantified expressions cannot bind outside a conjunct, it follows that an NP in one conjunct cannot license a pronoun with a β -occurrence of a variable in another.

in how variable binding is treated, it is possible to analyze the VPs in each of the three conjuncts as strictly identical under the above analysis and still capture the Dahl reading of the sentence in (137). The relevant representation which captures this reading is given below.

- (139) [Max₁]₂ thinks [he₂] is strong], [Oscar₃]₂ thinks [he₂] is strong] too, but [[his₃]₂ father₅] doesn't think [he₂] is strong]

As under Fiengo and May's analysis, the elided pronoun in the third conjunct will have to be bound. Since its index is interpreted as a variable over guises, and since it cannot be bound by anything outside the third conjunct, it must be bound within that conjunct. This will only be the case if one of the expressions in the third conjunct raises via QR at LF, and the associated λ -operator binds the pronoun. If we choose the pronoun *his* as the expression which undergoes QR, we can obtain the representation in (139). There is an important difference between the two analyses which arises at this point, however. For Fiengo and May, it is an automatic result of the binding of *he* by *his* that *his* ends up coindexed with *Oscar*. Under the above analysis, on the other hand, such coindexing is not forced. This leaves open the possibility of assigning some other arbitrary index to that pronoun. If the sentence is interpreted in such a way that *his* is taken to denote *Sam*, then, the above analysis leads to the prediction that the third conjunct should be interpretable as *Sam's father doesn't think Sam's strong*. If *his* is used deictically, uttered with an accompanying gesture toward Sam, then I believe that just such an interpretation is available for (137). This can be seen especially clearly in (140).

- (140) Max thinks he's strong, Oscar does too, but HIS FATHER doesn't, so neither does HE.

Since Fiengo and May's analysis cannot account for this interpretation, the possibility of such an interpretation argues in favor of the above analysis of pronominal interpretation and against that of Fiengo and May.

One final example considered by Fiengo and May is the following.

- (141) John said he is crazy before the teacher did, and Bill did too.

In this sentence, there are two separate deletions sites, hence two pairs of VPs which must be identical at LF. The VP of the superordinate clause of the first conjunct must be identical to that of the subordinate clause of that conjunct, and the VP of the entire first conjunct must be identical that of the second conjunct. As Fiengo and May point out, when the overt pronoun is interpreted as *John*, there are the three possible interpretations for the sentence as a whole indicated below.

- (142) a. John said John is crazy before the teacher said John is crazy, and Bill said John is crazy before the teacher said John is crazy.
 b. John said John is crazy before the teacher said the teacher is crazy, and Bill said Bill is crazy before the teacher said the teacher is crazy.
 c. John said John is crazy before the teacher said John is crazy, and Bill said Bill is crazy before the teacher said Bill is crazy.

Fiengo and May's analysis of these interpretations is unproblematic. For the uniform strict reading indicated in (142a), they assign the overt pronoun *he* an α -occurrence of the index assigned to *John*. For the uniform sloppy reading indicated in (142b), they assign this pronoun a β -occurrence of the index assigned to *John*, and reindex the pronoun in the (elided) subordinate clause so that it is bound by the NP *the teacher*. For the mixed reading indicated in (142c), they again assign the overt pronoun a β -occurrence of the index assigned to *John*, but the pronoun in the subordinate clause keeps this same index. The resulting LF representations are given below.

- (143) a. John_1 said he_1^α is crazy before the teacher₂ said he_1^α is crazy, and Bill₃ said he_1^α is crazy before the teacher₂ said he_1^α is crazy too.
 b. John_1 said he_1^β is crazy before the teacher₂ said he_2^β is crazy, and Bill₃ said he_3^β is crazy before the teacher₂ said he_2^β is crazy too.
 c. John_1 said he_1^β is crazy before the teacher₂ said he_1^β is crazy, and Bill₃ said he_3^β is crazy before the teacher₂ said he_3^β is crazy too.

The analysis developed above makes the same predictions in a largely similar fashion. The first reading is generated by assigning *John* and *he* in (141) the same free index, while the second and third readings are generated by assigning the pronoun *he* an index bound by a λ -operator which applies to *John*. The distinction between the two readings under

this analysis derives from a difference in the part of the LF representation associated with the NP *the teacher*. If this NP is raised via QR and the λ -operator left behind in the process ends up with the same index as the pronoun, then the resulting representation will give rise to the interpretation indicated by (142b). Otherwise, the interpretation that results will be that indicated by (142c). I give illustrative LF representations below.

- (144) a. [John₁] said [he₁] is crazy before [the teacher₂] said he₁ is crazy, and [Bill₃] said [he₁] is crazy before [the teacher₂] said he₁ is crazy too
- b. [John₁]₄ said [he₄] is crazy before [the teacher₂]₄ said [he₄] is crazy, and [Bill₃]₄ said [he₄] is crazy before [the teacher₂]₄ said [he₄] is crazy too
- c. [John₁]₄ said [he₄] is crazy before [the teacher₂] said he₄ is crazy, and [Bill₃]₄ said [he₄] is crazy before [the teacher₂] said he₄ is crazy too

Other LF representations are predicted to be possible for this sentence as well, but there are no others which will have interpretations truth-conditionally distinguishable from those given here.¹⁴ Thus, the present analysis accounts nicely for the interpretations available for this sentence.

3.4.2 Pseudo-sloppy Identity

In the preceding section, I argued for the analysis of pronominal interpretation based on the analysis of Heim (1992) and for an accompanying analysis of VP deletion and deaccenting based on identity of indices over the analysis proposed by Fiengo and May (1991). There were two cases which were seen to differentiate the theories in question, both of which I claimed argued in favor of the former analysis. The facts in each case were fairly subtle, however, and one might well balk at making any grand claims on the basis of these facts alone. However, there is another class of cases in which the facts are much clearer, and these facts once again support the analysis adopted here over that of

¹⁴Again, there are cases which will differ from (144a) only in the value of the index assigned to the various occurrences of the pronoun *he*, although all occurrences of the pronoun must be assigned the same index in such cases. This would yield a class of readings identical to the uniform strict interpretation in (144) except (possibly) for the individual denoted by the guise associated with the pronouns.

Fiengo and May. These are cases first considered by Kitagawa, two of which are given in the (a) examples below.

(145) (= Kitagawa's 20)

- a. Sam wants Mary to advertise his daughter before Bill does.
- b. Sam wants Mary to advertise Sam's daughter before Bill advertises Bill's daughter.

(146) (= Kitagawa's 22)

- a. Sam wants Mary to ask Sue to advertise him before Bill does
- b. Sam wants Mary to ask Sue to advertise Sam before Bill asks Sue to advertise Bill.

Here, the interpretations of interest are those indicated by the sentences in (b). These interpretations are similar to sloppy identity sentences in that the pronoun is treated like a variable bound by the subjects of each of the clauses. It differs from the sloppy identity interpretations previously considered, however, in that antecedent-pronoun relation in the overt clause is not identical to that in the elided clause. The problems this causes for Fiengo and May's analysis should be readily apparent. The only way in which they can account for sloppy-like readings of a pronoun is by assigning the pronoun a β -occurrence of an index with distinct values given to the index of the overt pronoun and that of the elided pronoun. Thus, to account for the relevant interpretation of (145a), they would have to associate this sentence with the following LF representation.

(147) Sam₁ wants Mary to advertise his_{1 β} daughter before Bill₂ advertises his_{2 β} daughter.

The problem with such a representation is that the dependency between the first occurrence of the pronoun *his* and *Sam* is not identical to the dependency between the second occurrence of the pronoun and *Bill*, and hence the elided VP will not count as identical to its antecedent under their analysis. Since there is no other possible representation of this sentence which captures the desired interpretation and which does satisfy Fiengo and May's identity criteria for VP deletion, this example stands as a strong counterexample to Fiengo and May's analysis.

Under the analysis adopted here, the availability of the interpretations given in (145b) and (146b) for the respective (a) sentences is exactly what is expected. The LF representations which give rise to these interpretations are the following.

- (148) a. [Sam₁]₂ wants Mary [PRO to advertise [his₂] daughter before [Bill₃]₂ advertises [his₂] daughter]
 b. [Sam₁]₂ wants Mary [PRO to ask Sue PRO to advertise [him₂] before [Bill₃]₂ asks Sue PRO to advertise [him₂]]

In each representation, the VP in the deletion site is exactly identical to the immediately embedded VP of the superordinate clause, as required by the analyses of VP ellipsis developed in section 3.3 above.

While the analysis outlined and defended in this chapter goes a long way for accounting for the interpretational possibilities of pronouns in VP ellipsis contexts, there remains one type of example that the analysis cannot handle, which I illustrate with the sentence in (149).

- (149) Sam wants Bill to advertise his daughter before Mary does.

According to the analysis under consideration, it should be possible to interpret this sentence so that the antecedent of the overt pronoun is taken to be *Bill* while that of the elided pronoun is taken to be *John*, as in the interpretation indicated in (150).

- (150) Sam wants Bill to advertise Bill's daughter before Mary advertises John's daughter.

Such an interpretation will be generated by the LF representation given in (151) below, which according to the present analysis is predicted to be well-formed.

- (151) [Sam₁]₂ want_ε [Bill₃] [PRO]₂ to advertise [his₂] daughter] before Mary advertises [his₂] daughter]

It is highly dubious that such an interpretation exists for this sentence, however, and in this case building up an intricately contrived circumstance which would favor such an interpretation does nothing to help bring such an interpretation out. The only way

I can see at present of accounting for this example within the theory developed is to require that the dependency between the second pronoun and its binder not include that between the first pronoun and its binder, where inclusion is defined in terms of path containment (cf. Pesetsky (1982)). Why dependency relations should make a difference here when they haven't made any difference elsewhere I have no way of explaining. Since such an explanation can obviously be made to exclude this example, and since there is no principled reason I can see for why such an explanation should be adopted, I leave the details of the analysis unspecified until the analysis can be properly motivated.

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