

correspondence between the two positions in the logical representation and the two readings of the bare plural subject. The existence of two S-structure subject positions in German is supported by the *was-für* and split-topic extraction facts.

The contrasts between stage- and individual-level predicates in both languages also support the correspondence between the two syntactic subject positions and the two positions in the logical representations. Here the possibility of the existential, or “internal,” reading correlates with the possibility of extraction. I have suggested that the two predicate types are distinguished by two parameters, θ -role assignment to [Spec, IP] and the presence/absence of a “Davidsonian” event argument (following Kratzer (1989)).

Finally, I discussed a number of cases that seem to present problems for a simple two-way division of predicate types. I showed that these difficulties can be accommodated by a number of different means. Although some predicate types require additional variation in the two parameters differentiating predicate types (e.g., the individual-level unaccusatives), other predicates (those involving states of emotion) seem to have two distinct stage-level and individual-level forms. Finally, for a number of stage-level predicates context plays an important role in determining which interpretation of a bare plural subject (the generic or the existential) is preferred.

In this chapter I have limited myself to discussing the interpretation of bare plural subjects. In chapter 3 I extend the Mapping Hypothesis to NPs of other types. I show that many of these also admit of two interpretations, one corresponding to a tripartite quantificational structure and the other corresponding to binding by existential closure. I also discuss the interpretation of object NPs and consider the relationship between restrictive clause structures and the operation of the rule of QR proposed by May (1977, 1985).

3.1 Introduction

In the previous chapter I introduced the Mapping Hypothesis and showed how it explained a number of facts concerning the interpretation of a particular type of NP—the bare plural—in English and German. In this chapter I extend my analysis to indefinite and quantificational NPs in general. Taking Kamp’s (1981) and Heim’s (1982) analyses of the interpretation of indefinites as my starting point, I propose that there are actually two types of indefinites (rather than treating them uniformly, as Kamp and Heim do): those that form restrictive clause structures, and those that are bound by existential closure. The syntactic nature of the derivation of the tripartite logical representations (as represented by the tree-splitting algorithm) leads to the consequence that these two types of indefinites are themselves distinguished syntactically by the operation of the rule of QR (May 1977, 1985).

3.2 Tree Splitting and Quantification

The tree-splitting algorithm has a number of syntactic and semantic consequences for a theory of quantification. As a result of the formation of the restrictive clause and nuclear scope by dividing the tree into two parts, the categories IP and VP are distinguished in the derivation of logical representations as domains for different kinds of quantification, and thus IP subjects and VP subjects are also semantically differentiated. In the rest of this chapter I take a closer look at quantification and the Kamp-Heim theory of indefinites in light of the Mapping Hypothesis that I have proposed. I show that indefinites are actually ambiguous between presuppositional and nonpresuppositional readings (as originally observed by

Milsark (1974)). Rather than presenting a problem for a theory that represents indefinites as variables (an objection in fact raised by De Hoop and De Swart (1990)), this ambiguity can be neatly represented in a Kamp-Heim framework by the IP/VP contrast coupled with the tree-splitting procedure.

3.2.1 Some Consequences of Tree Splitting

The first step in examining quantification in the context of the tree-splitting procedure for mapping to logical representations is to step back and take a look at where and how this proposal deviates from the original Kamp-Heim theory of the interpretation of indefinites. The first point of departure involves the domain of existential closure. I claimed that the domain of existential closure should be defined in sentential terms as the VP of the sentence. In other words, only nuclear scopes (which correspond to VPs, by the Mapping Hypothesis) are subject to existential closure. This contrasts with the original Kamp-Heim theory, in which existential closure applies to sentences, and an additional existential closure operation applies to the entire text, or discourse.

Restricting existential closure to nuclear scopes was initially motivated in chapter 2 by the interpretation of bare plurals generated outside VP (as in the case of subjects of individual-level predicates). These NPs can never receive an existential interpretation, and this observation led to the claim that they must be outside the domain of existential closure. Permitting existential closure of texts as well as nuclear scopes would make it impossible to maintain this result.

Independent arguments against the original Kamp-Heim approach to existential closure have also been given by Kadmon (1987), Heim (1990), and Kratzer (1989).¹ I will take Kadmon's observations as my starting point in this discussion. Kadmon uses examples from Evans 1977 to argue that existential closure of texts makes incorrect predictions regarding the binding of pronouns that are not c-commanded by their antecedents, such as in (1).

(1) Oscar owns sheep. Otto vaccinates them.

Existential closure applied to the text in (1) yields the interpretation that Oscar owns sheep that Otto vaccinates, as shown in the representation in (2).

(2) $\exists_x [x \text{ is a sheep} \wedge \text{Oscar owns } x \wedge \text{Otto vaccinates } x]$

The reason that (2) does not correctly represent the meaning of the text in

(1) is that on its most natural reading (1) carries the implication that Otto vaccinates *all* of Oscar's sheep, or that Otto vaccinates whatever sheep Oscar owns. (Kadmon calls this implication the "Uniqueness/Maximality Effect.") The logical representation in (2) (in which the pronoun is bound by existential closure applying to the whole text) merely asserts that there are *some* sheep owned by Oscar and vaccinated by Otto. This interpretation does not necessarily yield the implication carried by the actual text in (1)—the logical representation in (2) could be true if there are some sheep that Oscar owns that Otto doesn't vaccinate. The argument against existential closure of texts rests on the observation that if pronouns such as *them* in (1) are analyzed in some way other than being bound by a discourse-level operation of existential closure, this problem in the logical representation does not arise. The question then is how to represent these pronouns.

One possibility is that developed by Kadmon. She argues that all definites that are not syntactically (i.e., c-command) bound must refer to some unique set or another. The variation on this approach that I will take here is to limit existential closure to nuclear scopes only and to simply give pronouns such as *them* in example (1) the analysis proposed by Evans (1977) for these cases. Evans calls these pronouns "E-type" pronouns. As illustrated above, these are pronouns that are anaphorically related to NPs that do not c-command them. (For example, in (1) *them* is related to *sheep* in the preceding sentence.) Evans treats E-type pronouns as definite descriptions, so that *them* in (1) corresponds to 'the sheep that Oscar owns'. With this type of analysis, we no longer need existential closure of texts, since the correct anaphoric relations between pronouns and their non-c-commanding antecedents will be given by the E-type analysis.² Therefore, I will simply take examples such as (1) as additional evidence that there is *no* existential closure of texts, and that existential closure applies to nuclear scopes (or VPs) only, as implied by the tree-splitting algorithm.

This restricting of the operation of existential closure to nuclear scopes leads to a second important consequence of the Mapping Hypothesis concerning a constraint on the interpretation of indefinites. If the nuclear scope of the logical representation is formed from the VP of a sentence, as claimed in the Mapping Hypothesis, then a clear prediction is made regarding the syntactic distribution of indefinites that lack quantificational force. All existential, nongeneric indefinite NPs that have no quantificational force of their own must be within the VP after tree splitting applies (whether at LF or S-structure).³ This is so that they can receive existential

force from existential closure, which applies only to nuclear scopes, or VPs. (The indefinite determiners in these cases function as cardinality predicates applied to the variable introduced by the NP.) If they were to remain external to the VP, the variables introduced by these NPs would remain unbound.

The correctness of this consequence of the Mapping Hypothesis clearly depends on which NPs are said to have no quantificational force. In the original Kamp-Heim theory *all* indefinites are claimed to be without quantificational force. If this were actually the case, the following sentence would be ungrammatical:

- (3) ... weil zwei Kinder ja doch auf der Straße spielen.
since two children 'indeed' in the street play

The sentence in (3) should be bad because the subject NP *zwei Kinder* 'two children' is a nongeneric indefinite (and therefore without quantificational force, according to Heim (1982)), and it is *external* to the VP, as indicated by the fact that it appears to the left of the particles *ja* and *doch*. Since the mapping to logical representations (tree splitting) in German in cases like (3) does not involve any LF lowering of the subject NP (recall the discussion in chapter 2), the subject NP will not end up in the domain of existential closure, since it will not be mapped into a nuclear scope because it is not contained in the VP. However, contrary to prediction, the sentence in (3) is perfectly grammatical. If the Mapping Hypothesis is correct, the indefinite NP in (3) must in fact have quantificational force of its own. In other words, the indefinite must be able to form a restrictive clause, with the determiner *zwei* 'two' functioning as an operator binding the variable introduced in the restrictive clause, rather than functioning as a cardinality predicate.

Thus, the original Kamp-Heim conception of indefinites as being uniformly without quantificational force is not compatible with the Mapping Hypothesis that I have proposed. In order to maintain the Mapping Hypothesis, we need to reconsider the classification of indefinites. Specifically, we need (at least) *two* types of indefinites. In addition to indefinites with no quantificational force of their own (cardinality predicates, or traditional Kamp-Heim indefinites), which receive existential force from existential closure, we need indefinites that have quantificational force and form operator-variable structures by introducing a restrictive clause. In the next section I present an alternative to the original Kamp-Heim view of indefinites (based on the work of Milsark (1974)) that meets

these requirements. This classification not only allows us to maintain the Mapping Hypothesis, but also provides additional support for it.

3.2.2 Ambiguous Indefinites and Milsark's Classification

The idea that indefinites might have multiple interpretations is certainly not a novel one. Milsark (1974) distinguishes two types of determiners, which he calls *strong* and *weak*, and gives a syntactic diagnostic for distinguishing between them. Weak determiners can appear with a subject NP in *there*-insertion contexts, whereas strong determiners cannot (the so-called definiteness effect). This is shown in the examples in (4).

- (4) a. There is/are a/some/a few/many/three fly (flies) in my soup.
b. *There is/are the/every/all/most fly (flies) in my soup.

These examples show that the determiners *a*, *some*, *a few*, and *many* are all weak determiners. Also included in this class are the numerals, such as *three*. The strong determiners include *the*, *every*, *all*, and *most*, as shown by the fact that they are ungrammatical in the *there*-insertion context given in (4b).

Milsark also describes what he calls a semantic distinction between the two types of determiners. This distinction centers on the notion of presuppositionality. Strong determiners presuppose the existence of the entities they are applied to. Weak determiners are ambiguous between a presuppositional reading and a nonpresuppositional reading in which they merely assert the existence of whatever entities they are applied to.⁴ This ambiguity of weak quantifiers can be seen in (5).⁵

- (5) a. There are some ghosts in my house. (unstressed *some*, asserts existence of ghosts)
b. SOME ghosts are in the pantry; the others are in the attic.
(presupposes the existence of ghosts)

In (5a) the nonpresuppositional, or cardinal, reading of the determiner *some* is shown. In this sentence the determiner *some* is unstressed, and the sentence simply asserts the existence of ghosts in my house (in *there*-insertion contexts such as (5a) the cardinal reading of a weak determiner is in fact the only reading possible). If there are ghosts, the sentence is true. If ghosts turn out not to exist, the sentence will be false. In (5b) the determiner is stressed, and the presuppositional reading is most salient. This sentence presupposes the existence of ghosts. If no ghosts exist, the sentence will not be straightforwardly false; its truth-value will be un-

defined. The presuppositional reading, unlike the cardinal reading, can be paraphrased as a partitive: ‘three of the ghosts’.⁶

Strong determiners, on the other hand, are unambiguous. They permit only the presuppositional reading. The cardinal reading is not possible, as shown by the sentences in (6).

- (6) a. Every ghost roasted marshmallows.
- b. Most ghosts sleep late.

Both the sentences in (6) carry the presupposition that ghosts must in fact exist. In the absence of ghosts the sentences have no truth-value.

In summary, Milsark proposes to group determiners into two classes. The first class, the strong determiners, consists of those determiners that are unambiguously presuppositional and produce ungrammaticality in *there*-insertion contexts. The second group, the weak determiners, are ambiguous between a cardinal and a presuppositional reading. And unlike the strong determiners, the weak determiners are acceptable in *there*-insertion sentences. In this context only the cardinal reading is possible.

The question that remains is, How does this classification of determiners get us out of the dilemma concerning indefinites that I noted in the previous section? Recall that the problem was that the tree-splitting procedure for deriving logical representations forced us into a position where we needed two types of indefinites, those with quantificational force of their own, and those without quantificational force. This conclusion was forced by the fact that not all indefinites need to be within the VP at the point of tree splitting, as shown by the German data. In the next section I attempt to resolve this dilemma by means of investigating the connection between Milsark’s semantic classification of determiners and the syntactic properties of the tree-splitting algorithm.

3.2.3 Presuppositions and the Syntax of Determiners

The proposed syntactic basis for the components of the logical representation points toward a syntactic account of Milsark’s semantic distinction between strong and weak determiners. The hypothesis that I wish to investigate here is that strong and weak determiners differ with respect to how they are treated at the level of LF (or the level at which tree splitting occurs). This involves amalgamating recent ideas concerning the role of presuppositions in semantic representations (following Heim (1983) and Berman (1991)) with commonly held assumptions about the syntax of quantifier scope.

In the Government-Binding Theory scope relations are represented through the use of movement rules that apply at the level of LF. Specifically, May (1977, 1985) has proposed that the scope domains of quantified NPs are represented by means of the movement rule QR, which adjoins the quantified NPs to IP. The scope domain of the quantifier consists of the nodes it c-commands from its raised position, and the raised NP leaves behind a trace that it binds from its raised position.⁷ One interesting property of May’s account, and of most other analyses assuming a movement-based approach to quantifier scope representation, is that all quantifiers (both strong and weak) are treated equally by QR.⁸

I would like to suggest here that the strong and weak determiners actually differ with respect to QR. Strongly quantified NPs behave like quantified NPs in May’s account. They are raised by QR to adjoin to IP. When tree splitting applies, they form a tripartite quantificational structure consisting of an operator (the quantifier), a restrictive clause, and a nuclear scope. Weak quantifiers, on the other hand, are ambiguous. On their cardinal reading, they do not induce QR (in the sense of adjoining to IP). NPs with weak quantifiers may remain within the VP, functioning as cardinality predicates that introduce variables that are given existential force by existential closure. Thus, a cardinality predicate, in conjunction with existential closure, asserts the existence of a set whose size is specified by the determiner (the “size” of sets introduced by relative determiners such as *few* and *many* will of course be contextually determined).⁹ On their presuppositional reading the weak quantifiers behave just like strong quantifiers. They are raised to IP by QR, and they form a tripartite quantificational structure.¹⁰

At this point two immediate consequences of this proposal become evident. The first is that the syntactic distribution of indefinites is explained. There is no longer any mystery about why the following sentence is grammatical:

- (7) ... weil zwei Kinder ja doch auf der Straße spielen.
 since two children ‘indeed’ in the street play

In the analysis presented here the indefinite NP *zwei Kinder* ‘two children’ can have two readings, since the numeral *zwei* ‘two’ is a weak determiner. On its cardinal reading it would have no quantificational force and would therefore have to remain in the VP. But it can also have a presuppositional reading, due to the ambiguity of weak determiners. On this reading it maps into a restrictive clause, and therefore not only *can* be external to the VP, but at some level *must* be external to the VP. The presuppositional

reading is in fact the only reading possible in (7). (I will discuss the distribution of the various readings of indefinites in German in more detail below.)

A second consequence is that the relationship between the presuppositional nature of the “strong” readings and restrictive clause formation is given a syntactic characterization. To see how this works, we need to consider first the role of the restrictive clause in the logical representation and how it relates to the notion of presupposition that I have been using to characterize what we might now call the *quantifier-raising (QR) reading* of indefinites.

Generally, in a tripartite logical representation the restrictive clause defines a set that the quantifier quantifies over.¹¹ If this set is empty, the truth-conditions for the sentence will be undefined. Thus, the set defined by the restrictive clause can be taken to represent the existence presupposition induced by the quantifier. In other words, the presuppositions induced by the quantifier are somehow incorporated into the restrictive clause.

The hypothesis that the presuppositions of a quantified sentence are represented in the restrictive clause is also discussed by Berman (1991), who assimilates the process of restrictive clause formation to the notion of presupposition accommodation of Lewis (1979).¹² The basic idea behind presupposition accommodation is that conversations involve a “conversational background” of information that the conversational participants take for granted. Accommodation is the process by which this background is “updated”—additional information is incorporated into the conversational background as new presuppositions become apparent. To give a concrete example, if I say to a friend who up to that point has been unaware of the specifics of my eating habits “I am going to give up eating Brussels sprouts,” my friend will automatically accommodate the presupposition that I did until that time eat Brussels sprouts and will thereby be able to interpret my sentence. (This is admittedly a rather informal description; for a more formal account, see Heim 1983.) The claim made by Berman (in the context of the semantics of questions) is that the incorporation of presuppositions of a quantified sentence into the restrictive clause is simply another instance of this sort of presupposition accommodation.

The Mapping Hypothesis, along with the tree-splitting procedure that forms the restrictive clause from IP-level material, leads to the conclusion that in the case of quantified NPs this process of accommodation is essentially syntactic in nature, mediated by the rule of QR. Following Berman, then, the presuppositions induced by quantified NPs must be

incorporated into a restrictive clause. Thus, presuppositional NPs that are within VP at S-structure must be raised to IP by QR at the level at which tree splitting takes place in order to be mapped into a restrictive clause. (Note that tree splitting in English clearly always takes place at LF. I will discuss the case of other languages such as German in chapter 4.)

A concrete example of how this works can be seen in the case of a “strong” interpretation of a quantified object NP. The presupposition of existence induced by the “strong” reading is reflected in the formation of a restrictive clause. This restrictive clause formation can in turn be regarded as a syntactic property, since the formation of a restrictive clause is the result of having raised the NP (by QR) to adjoin to IP, as required by the Mapping Hypothesis. A further consequence of the tree-splitting algorithm is that NPs that are not raised to the IP level do not induce the formation of a restrictive clause. Thus, Milsark’s presuppositional/cardinal distinction has a syntactic representation (with respect to whether or not QR applies) at the level at which tree splitting occurs.

3.2.4 The Strong/Weak Distinction and Relative Scope

Deriving Milsark’s strong/weak distinction from the presence or absence of restrictive clause formation through QR also has a number of consequences with regard to relative scope determination. The first consequence concerns the actual relative scope predictions for particular determiners in multiply-quantified sentences. Whereas most syntactic accounts of quantifier scope phenomena treat quantifiers equally with respect to relative scope, the account I have outlined makes a clear differential prediction with regard to different quantifier types (see also Kroch 1974 and Ioup 1975 for accounts of relative quantifier scope based on scope order preferences rather than syntactic movement operations). In a sentence with a *weakly* quantified subject (on its cardinal reading) and a *strongly* quantified object (presuppositional), the object should receive wider scope than the subject.

- (8) a. Sm cellists played every suite today.
- b. Mny cellists played SOME suite today.
- c. Tw cellists played SOME suite today.

In the sentences in (8) the strongly quantified object NPs *every suite* and *sOME suite* take scope over the weakly quantified subject NPs. (I indicate the unstressed readings of the determiners by deleting the vowels.) The syntactic account of the strong/weak distinction derives this relative scoping in a fairly straightforward way. The presuppositional object NPs are

raised to IP at LF by QR, where they form a restrictive clause by tree splitting. In contrast, the cardinal subject NP lowers at LF back into [Spec, VP], where it can receive existential force by existential closure. Thus, the object NP takes wider (IP) scope than the subject NP, which is confined to VP.¹³

This variation in scope preference conforms with other observations in the literature on relative scope. In a discussion of the factors that determine relative quantifier scope, Ioup (1975) notes that the various quantifiers differ in relative scope preferences. Ioup represents these varying relative scope preferences among quantifiers in the form of a hierarchy. The leftmost elements in the hierarchy show the greatest preference for wider scope, and the rightmost elements show the greatest preference for narrower scope:

(9) *Ioup's hierarchy*

each > every > all > most > many > several > some > a few

This hierarchy bears an interesting relationship to Milsark's classification. If the hierarchy in (9) is bisected, the quantifiers in the left-hand half (those tending toward wider scope) all fall into the class of strong determiners, and those in the right-hand half (those tending toward narrower scope) all fall into the class of weak quantifiers. Thus, in a very rough way, Milsark's binary strong/weak classification mirrors Ioup's hierarchy.

One type of NP that Ioup does not incorporate into her hierarchy is the bare NP, exemplified in English by bare plurals. As an initial rough characterization, bare plural NPs follow the pattern of NPs with weak determiners in being permissible in *there*-insertion sentences:

(10) There are spiders in my bed.

As far as the more particular scope preference of bare NPs is concerned, Carlson (1977b) notes that bare plurals tend to take narrow scope relative to other NPs or operators within the sentence:

- (11) a. Everyone read books about slugs.
- b. Yella didn't find spiders in her bed.

The properties illustrated by the sentences in (10) and (11) lead to the conclusion that the bare plurals should be grouped with the weakly quantified NPs, and thus the bare plurals would fall into place on the right-hand (narrow scope) side of Ioup's hierarchy.

The correspondence between Ioup's hierarchy and Milsark's classification is explained by the syntactic description I have given of strong and

weak determiners. The wide scope preference of strong determiners follows from the fact that they are always presuppositional and therefore are always raised by QR. The application of QR guarantees that they always have the IP as their scope domain. Weak determiners differ from strong quantifiers in that they can have a cardinal reading in which they are bound within the VP by existential closure. Thus, weak determiners on their cardinal reading have only the VP as their scope domain. Their narrower scope preference thus results from the fact that their scope domain is contained within the higher IP-level scope domain of the strong quantifiers.¹⁴

3.2.5 Relative Scope: An Additional Reading

Differentiating presuppositional and cardinal interpretations of NPs in terms of QR leads to a second consequence of the syntactic characterization of strong and weak determiners. This result concerns certain relative scope phenomena that arise from the ambiguity of the weak determiners. This ambiguity permits a recursive embedding of tripartite logical representations in multiply-quantified sentences, with the consequence that an additional reading emerges, which is not expected from traditional analyses of relative scope.

Most accounts of multiply-quantified sentences such as (12) discuss only two readings, which are determined only by the relative scope of the quantified NPs that results from the ordered application of QR to the two quantified NPs.

(12) Every cellist played some variations.

In a syntactic account such as May 1977, these two readings can be represented through different orderings of the application of QR, as shown in (13).¹⁵

- (13) a. [Every cellist]_α [Some variations]_β α played β
- b. [Some variations]_β [Every cellist]_α α played β

In (13a) the subject NP *every cellist* takes wider scope than the object NP *some variations*. In (13b) this relationship is reversed, with the object NP taking scope over the subject NP.

In the account I have presented, *three* readings are expected for the sentence in (12). Because of the ambiguity of weak determiners, there are in fact two, rather than only one, narrow scope readings for the object NP *some variations*:

- (14) a. [Every_x [cellist(x)] Some_y [variations(y)] x played y]
 b. [Every_x [cellist(x)] \exists_y variations(y) \wedge x played y]
 c. [Some_y [variations(y)] Every_x [cellist(x)] x played y]

Since *some* is a weak quantifier, it can have either a presuppositional reading (in which a restrictive clause is formed) or a cardinal reading (the NP remains within the VP/nuclear scope), regardless of whether it takes wide or narrow scope with respect to the subject NP. The narrow scope, presuppositional reading is shown in (14a), and the cardinal reading is shown in (14b). The third reading is the one in which the object NP gets wider scope, and here of course it has a presuppositional reading, since it must raise to IP to take scope over the subject, which has a strong determiner and therefore cannot lower to VP.

The derivations of the readings result in recursive embedding of tripartite structures. That is, the nuclear scope of the outermost restrictive clause in both (14a) and (14c) contains an embedded restrictive clause and its nuclear scope. (14b) is the more familiar simple tripartite structure. These readings can all be derived straightforwardly by QR followed by tree splitting, which maps the LF representations into the Heim-style logical representations. In the case of (14a), the first step is to adjoin the object NP *some variations* to IP (to derive the presuppositional reading). Next, the subject NP is adjoined to the left of the object NP. This gives the post-QR LF representation:

- (15) [_{IP} every cellist_x [_{IP} some variations_y [_{VP} t_x [_{VP} t_x played t_y]]]]]

Tree splitting now applies to the adjunction structure and “peels off” the first IP layer, forming a restrictive clause containing *cellist(x)*:

- (16) Every_x [cellist(x)] [_{IP} some variations_y [_{VP} x played y]]]

Since there is still a layer of IP that has not yet been affected by tree splitting, this step is repeated, producing another restrictive clause embedded below the first:

- (17) Every_x [cellist(x)] Some_y [variations(y)] [_{VP} x played y]

The VP is then mapped into a nuclear scope, with the traces functioning as variables:¹⁶

- (18) Every_x [cellist(x)] Some_y [variations(y)] x played y

The derivations of the remaining two readings proceed along similar lines. In the case of (14b), with the narrow scope, cardinal reading of the object NP, no recursive embedding of tripartite structures is necessary.

The wide scope reading of the object NP in (14c) produces an embedded structure by the recursive peeling off of IP layers just as in the derivation of (18). Thus, the relative scope interpretation of quantified NPs in multiply-quantified sentences involves the interaction of two factors that can to some extent vary independently: relative scope and presuppositionality.

3.2.6 Does the Third Reading Really Exist?

Incorporating the notion of presuppositionality into the account of the strong/weak distinction leads to the prediction that there are three, rather than the usual two, readings in a case of multiple quantification such as (12), repeated here:

- (19) Every cellist played some variations.

The “extra” reading results from the ambiguity of weak quantifiers. Since weak quantifiers can have both cardinal and presuppositional readings, there are actually two possible narrow scope readings for the object NP *some variations*: a presuppositional reading (14a) and a cardinal reading (14b). The third reading for the sentence is that in which a wide scope reading obtains for the object NP. This third reading is, I think, uncontroversial. Less obvious may be the distinction between the two narrow scope readings for the object NP. The distinction between the cardinal and presuppositional narrow scope readings is subtle, but I think it can be brought out by presenting appropriate contexts for each of the readings.

Considering (19), one possible situation that would be common to all three readings is a competition for cellists. Each cellist plays some pieces, and the judges will pick the winner based on overall performance. When it comes to the variations, the competition could proceed in a number of different ways, allowing us to differentiate the three readings of (19). In the first case, there could be a list of optional pieces for the competition, including Tchaikovsky’s Rococo Variations, Beethoven’s Variations on a theme from “Judas Maccabeus,” and Mendelssohn’s Variations Concertantes. From this list each cellist picks a set of variations of his or her choice (they do not necessarily pick the same ones). In this context the sentence *Every cellist played some variations* exhibits the narrow scope, presuppositional reading for the object NP. This context involves selection of variations from a preestablished (or presupposed) set.

This contrasts with another possible scenario, in which there is no list of sets of variations. In fact, in this competition the cellists all must improvise a set of variations. It’s not likely the cellists would end up playing the same variations, and as improvisations their existence could

hardly be presupposed. This is the narrow scope cardinal reading for *some variations*.¹⁷ The context for the wide scope reading is straightforward. All the cellists play some variations, and they all play the same variations, for example, perhaps Tchaikovsky's Rococo Variations.

Since numerals behave in the same manner as weak determiners, these three readings can also be distinguished when a numeral quantifier appears on the object NP:

(20) Every person saw three ghosts.

Here the basic context could be visiting an old, rundown house. On the narrow scope, presuppositional reading of *three ghosts* the house could be known to be haunted by a set of ghosts such as the ghosts of all of Bach's 20-odd children. In this context, every person could see three of the ghosts, the partitive *of* indicating the presuppositional reading.

On the cardinal reading, the house would have no such preestablished reputation. Every person could see three ghosts, even three different ghosts each time. In this case the sentence in (20) would merely assert the existence of ghosts seen. Finally, on the wide scope reading, three well-known ghosts could be seen by every member of the visiting party, such as the ghost of Tchaikovsky, the ghost of Salieri, and the ghost of Millard Fillmore.

Although the difference between the presuppositional reading and the cardinal reading of a narrow scope weak NP is subtle, it can be highlighted by the context chosen. This is of course not at all surprising, since the difference between the two readings hinges on what is or isn't presupposed in the conversation. We can therefore conclude that taking into account the strong/weak distinction in a syntactic derivation of relative scope leads to a more complete account of the available readings.

3.2.7 Overview of Quantified NP Interpretations

So far we have seen that the tree-splitting procedure developed here has a number of consequences for a theory of the interpretation of indefinites. One result is that it has become clear that indefinite NPs should in fact be treated as being ambiguous between a cardinal reading and a presuppositional reading. Furthermore, examination of Milsark's classification of determiners shows that this classification corresponds neatly to the reclassification of indefinites that is required by the implementation of the Mapping Hypothesis. Incorporating the notion of "presupposition accommodation" into the tree-splitting procedure leads to an explanation of Milsark's "semantic" distinction between strong and weak determiners in

syntactic terms. Strong quantifiers adjoin to IP at LF (by QR); weak quantifiers remain within the domain of VP at LF. The cardinal/presuppositional contrast is thus represented in the logical representation by the presence or absence of a restrictive clause. The scope order differences between the two types of quantifiers (as observed by Ioup (1975)) result from their different domains at LF: IP and VP.

3.3 QR, Presuppositions, and the Mapping Hypothesis

In the discussion of the ambiguity of indefinites given above I claimed that there is a close connection between the more or less semantic notion of "presupposition of existence" and the application of the syntactic rule QR. To the extent that there is syntactic evidence for a syntactic rule of QR (such as that presented by May (1985)), there should also be syntactic reflexes of the ambiguity of indefinites. In the sections that follow I examine this connection between syntax and interpretation more closely and show that there is indeed a close syntactic connection between the presuppositional nature of certain NPs and their ability to appear in particular constructions that require quantificational (e.g., QRed) NPs.

QR also predictably disambiguates the two readings of indefinites (that is, weak NPs). In this connection I explore in more detail the close relationship between S-structure word order and the semantic interpretation of NPs in German that was introduced in chapter 2. I also examine the connection between the "outer" subject position ([Spec, IP]) and presuppositionality that is implied by the workings of the Mapping Hypothesis.

3.3.1 Antecedent-Contained Deletion: An Indicator of QR

One way to test the connection between quantifier raising and presupposition is to look at constructions where QR is required as a condition for grammaticality. In such contexts those NPs that do not undergo QR should produce an ungrammatical result, contrasting with those that do undergo QR. Put in another way, these constructions should disallow cardinal interpretations of NPs. Recent work on the syntax of LF has revealed a promising candidate for such a diagnostic of quantifier raising. This construction is a particular instance of VP-deletion known as *antecedent-contained deletion* (Bouton 1970, Sag 1976, Williams 1977, May 1985).

To see why antecedent-contained deletion (ACD) requires QR, we must first consider the constraints that apply to VP-deletions in general. These

constraints are outlined in the work of Williams and Sag. In particular, Sag (1976) claims that VP-deletion is subject to the c-command constraint given in (21).

(21) *C-command constraint on VP-deletion*

VP-deletion is possible iff neither the missing verb (marked by *do*) nor its antecedent c-commands the other.

This c-command constraint is obviously satisfied in the case of VP-deletion in sentential conjunctions:

- (22) a. Robert played piano and Clara did too.
 b. Robert played piano and Clara played piano too.

In (22a) neither the antecedent verb *played* nor the verb *did* (which marks the deletion site) c-commands the other, and as a result the sentence is grammatical. The deletion can also be easily recovered (following Williams (1977)) by simply copying the antecedent in the place of the deletion, as shown in (22b). Since the c-command constraint is satisfied, VP-deletion can apply freely in these cases of conjunction, with no restrictions on the form or interpretation (such as obligatory quantifier raising) of the object NP.

ACDs, on the other hand, are a special case of VP-deletion that appear to violate the c-command condition, a fact that was also noted by May (1985):

- (23) Robert played every piano that Clara did.

In (23) the antecedent verb *played* c-commands the site of deletion (indicated by *did*), violating the c-command constraint. Reconstitution of the deletion by direct copying of the antecedent is also impossible, since it leads to an infinite regress because the antecedent actually contains the deletion. But in spite of this apparent violation of the c-command constraint, the fact remains that the sentence is grammatical.

Both Sag (1976) and Williams (1977) have used the problem of ACD as a basis for arguing that the constraints on VP-deletion should apply to some abstract syntactic level of logical representation (e.g., LF), rather than to S-structure. The effect of this refinement of the constraints on VP-deletion is clearly seen in cases that involve the application of QR. For example, in the case of (23), stating the constraints on VP-deletion at LF means that the c-command constraint in (21) applies to the structure after QR has applied (May 1985):

- (24) a. [_{IP} Robert [_{VP} played [_{NP} every piano that Clara [_{VP} e]]]]]
 b. [[_{NP} every piano that Clara [e]]; [Robert played [_{NP} t_i]]]]
 []
 c. [[every piano that Clara played [_{NP} t_i]]] [Robert played [_{NP} t_i]]]

As May notes, the application of QR to the structure in (24a), shown in (24b), yields a structure in which the c-command constraint is no longer violated. After the object NP (which contains the deletion site) is adjoined to IP, neither the antecedent verb nor the deletion site c-commands the other. Recovery of the deletion is also now possible, since copying the antecedent (which is now the trace left by QR) no longer produces an infinite regress, as shown in (24c). Thus, to borrow May's apt description, QR licenses ACD by "disentangling" the infinite regress that it produces.

ACDs can therefore be thought of as a diagnostic for QR. ACD is grammatical only when the deletion is contained within an NP that undergoes QR. This leads to the prediction that if the deletion is not contained within an NP that undergoes QR (such as a cardinal indefinite bound by existential closure), ACD will produce an ungrammatical result. As a consequence, ACD should distinguish between cardinal and presuppositional indefinites. Therefore, it is not surprising that Carlson (1977a) notes that ACD contexts require a noncardinal NP ((25d) and (26e) are Carlson's examples):¹⁸

- (25) a. I read every book that you did.
 b. I read each book that you did.
 c. I read most books that you did.
 d. Max put everything he could in his pockets.
- (26) a. *?I read many books that you did.
 b. *I read few books that you did.
 c. *I read two books that you did.
 d. *I read books that you did.
 e. *Max put some/many/six things he could in his pockets.

The sentences in (25) are fine in any context. The sentences in (26) are unquestionably ungrammatical in the case of the cardinal (nonpartitive) reading.¹⁹ Since QR "saves" ACDs from violating Sag's c-command constraint, those cases where ACD is not grammatical must be those where QR does not take place. The examples in (25) and (26) show that this correlation is paralleled by the strong/weak distinction. Thus, the contrast in grammaticality between (25) and (26) indicates that there is indeed a

contrast between the strong and weak quantifiers with respect to whether or not they induce the application of QR.²⁰

The story is not quite so simple as saying that strong quantifiers induce QR and weak quantifiers don't, however. Since the weak determiners are in fact ambiguous, whether or not an NP is raised by QR depends on more than just the choice of determiner. Presupposition is the deciding factor. In contexts that are unambiguously presuppositional, weak determiners like *many* and *two* can appear with NPs containing a deletion. This is illustrated by the following examples containing partitive (and therefore presuppositional) NPs with weak determiners:

- (27) a. *There are two of the cows in the stable.
- b. *There are many of the pianos in need of tuning.
- (28) a. I read two of the books that you did.
- b. Robert played many of the pianos that Clara did.

The sentences in (27) show that NPs such as *two of the books* function as strong, or presuppositional, NPs in that they cannot appear in *there-*-insertion sentences. (28) shows that ACD is fine with NPs of this type, indicating that QR has occurred. Thus, it is not merely the choice of the determiner that determines whether QR takes place; the context must induce a presuppositional reading for the NP.

In summary, using the context of ACD as a diagnostic for QR allows for the testing of claims concerning the conditions for application of QR. The examples that I have considered show that there is a contrast between strong and weak determiners with respect to QR, just as would be expected under the analysis of NP interpretation proposed here. In addition, the contrast between presuppositional NPs and nonpresuppositional NPs in ACD contexts shows that the relevant factor in inducing QR is in fact presupposition, regardless of the choice of determiner.

3.3.2 Antecedent-Contained Deletion versus Extrapolation

The discussion in the previous section relies crucially on the quantifier-raising analysis of ACD proposed by May (1985). This analysis is not uncontroversial, however. In this section I examine a number of objections to the ACD analysis raised by Baltin (1987). I conclude that Baltin's proposed alternative analysis is in fact inferior to the QR analysis in that it does not adequately account for the distribution of ACD, nor does it explain the close relationship between presuppositional interpretations and the acceptability of ACDs.

Although May's analysis (as well as those of Sag (1976) and Williams (1977)) resolves the problem of recovering ACDs by means of an abstract intermediate level (LF) at which the deleted VP is no longer contained in its antecedent, Baltin (1987) claims that the relevant level for reconstitution of the deleted VP is S-structure. Since Baltin assumes in this connection that the c-command constraint proposed by Sag is correct, his proposal amounts to the claim that ACD is in fact never possible. In the face of this apparent contradiction, Baltin claims that apparent ACDs are actually just cases of string-vacuous extrapolation at S-structure, rather than involving movement (e.g., QR) at the abstract level of LF. In other words, apparent ACD sentences are derived in a fashion parallel to cases of PP- and S'-extrapolation (discussed in Ross 1967, Guéron 1980, Baltin 1981, 1984, and Guéron and May 1984, among others). Examples are given in (29) and (30).

- (29) a. A man who was from Bisbee arrived.
- b. A man arrived who was from Bisbee.
- (30) a. A review of "Jabberwocky" arrived.
- b. A review arrived of "Jabberwocky."

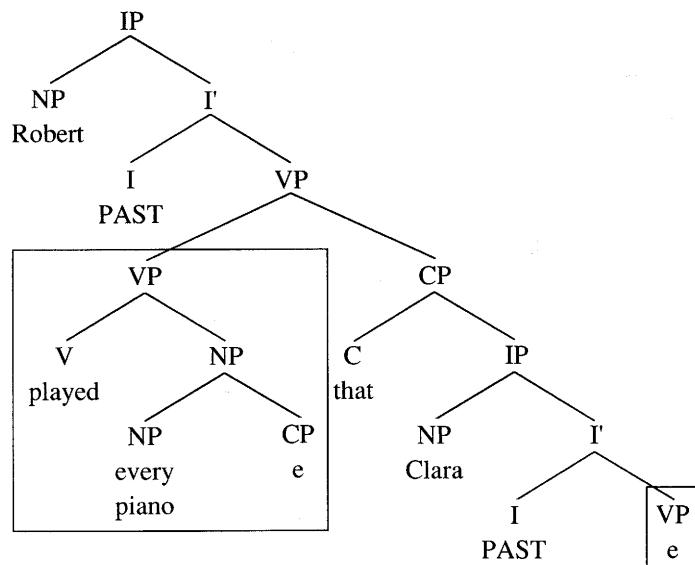
In (29b) the relative clause *who was from Bisbee* is extraposed, and in (30b) the PP *of "Jabberwocky"* is extraposed.

In Baltin's analysis, this process is extended to the apparent ACDs, so that the sentence in (31) involves string-vacuous extrapolation of the relative clause *that Clara did*. The relative clause adjoins to VP at S-structure, resulting in a structure in which the deletion site is no longer contained in its antecedent.

- (31) Robert played every piano that Clara did.

The result of this extrapolation is shown in the tree in (32). The structural relationship between the extraposed clause and its antecedent is illustrated by the boxes outlining the two parts.

(32) Baltin's extraposition analysis of ACD



The smaller box outlines the deletion site, and the larger box outlines the antecedent VP. As a result of the extraposition operation, the “deletion box” is no longer contained within the “antecedent box.” Thus, in Baltin’s analysis ACDs do not create problems with regard to the application of Sag’s c-command constraint simply because ACDs do not exist at S-structure.²¹

If Baltin’s analysis is correct, then ACD sentences might not in fact be indicators of QR. In his account the acceptability of (31) has nothing to do with LF movement of the NP *every piano*...; therefore, QR is not relevant. It is not clear that this analysis is correct, however. In response to Baltin’s analysis, Larson and May (1990) point out that ACDs differ internally from extraposed relatives and therefore should not be given an extraposition analysis. In addition to their arguments (involving the form and position of the subordinate clause and the interpretation of the deleted VP), I present some additional differences between extraposition structures and ACD that provide further evidence in support of the QR analysis.

If the apparent ACD structures are actually derived by extraposition, ACD and the other extraposition structures should be subject to the same restrictions. There does not seem to be a parallelism between the two types of constructions, however. Free relatives are one case of a syntactic envi-

ronment in which extraposition and ACD clearly show different behavior. Extraposition is impossible with free relatives (McCawley 1988: 432), whereas ACDs occur quite freely:²²

- (33) a. *It’s still in the car what he bought.
- b. *It needs tuning whatever piano Clara played.
- (34) a. Robert played whatever piano Clara did.
- b. I read whatever books you did.

Thus, extraposition and ACD show a rather different distribution with respect to free relatives. This fact gives an initial indication that ACDs cannot satisfactorily be given an extraposition-based analysis.

An even more striking difference between ACDs and extraposition structures involves the requirements imposed on the determiner of the NP involved. As I noted earlier, ACD requires a strong, or presuppositional, determiner:

- (35) a. *I read books that you did.
- b. *I read two books that you did.
- (36) a. I read every book that you did.
- b. I read each book that you did.

This is not true of PP-extraposition or relative clause extraposition. In fact, nonvacuous cases of extraposition from NPs with strong determiners are significantly less acceptable than the comparable cases involving weak determiners (see Guéron 1981 and Reinhart 1987):²³

- (37) a. *Olga sent every person to the library who wanted books on obscure Prussian composers.
- b. *Most men arrived who were from Bisbee.
- c. *Oscar gave each spider to Otto that was poisonous.
- d. Olga sent every person who wanted books on obscure Prussian composers to the library.
- e. Most men who were from Bisbee arrived.
- f. Oscar gave each spider that was poisonous to Otto.
- (38) a. *Every review appeared of “Jabberwocky.”
- b. *Each review appeared of this outrageous opera.
- c. Every review of “Jabberwocky” appeared.
- d. Each review of this outrageous opera appeared.

In (37) and (38) the examples involving extraposition from strong NPs are all ungrammatical, whereas the unextraposed versions are fine.

Thus, the most usual cases of extraposition do not show the property that is most essential to the quantifier-raising analysis of ACD structures: being licensed by a determiner that induces QR. In fact, they impose exactly the opposite restriction in that they require cardinal NPs. Regardless of the explanation of the judgments in (37) and (38), the fact that the ACD structures discussed in the previous section require presuppositional NPs and the extraposition structures in (37) and (38) require cardinal NPs strongly indicates that they should be given different analyses. As for the constraints on extraposition, I will discuss constraints on extraction from NPs in chapter 4, and some of these arguments may extend to the extraposition cases.

The comparison of the syntactic constraints imposed on ACD and extraposition shows that they should not be given the same analysis. Therefore, I will continue to assume that May's (1985) QR analysis of ACD is essentially correct and that as a consequence of this analysis, ACD structures act as a diagnostic for QR.²⁴

3.3.3 VP-Deletion and the Mapping Hypothesis

In presenting and justifying the Mapping Hypothesis, so far I have allowed myself two simplifications: I have limited my discussion of quantifier raising to the case of adjunction to IP, and I have described the tree-splitting procedure somewhat vaguely, in terms of largely intuitive notions of VP-internal versus VP-external. In this section I discuss some data that seem to require expanding the range of the rule of QR. This in turn leads to a reexamination of the tree-splitting procedure in order to make the notions of “material inside the VP” and “material outside the VP” more explicit.

Although adjunction to IP is often presented as the central case of QR, a number of researchers have proposed that QR should be more general in that quantifier phrases should be able to adjoin to nodes other than IP (Williams 1977, Stowell 1981, DeCarrico 1983, May 1985). One argument in favor of quantifier raising to VP in particular is based on facts concerning the interaction of quantifier scope with VP-deletion noted by Sag (1976) and Williams (1977).²⁵

Williams and Sag both note that multiply-quantified sentences are generally ambiguous in isolation, but in the context of VP-deletion the ambiguity disappears, and only the scope order corresponding to the linear order of the quantified NPs is possible:²⁶

- (39) a. Some bassoonist played every sonata.
- b. Some bassoonist played every sonata, but Otto didn't.

Thus, in (39a) the object NP *every sonata* can take either wide or narrow scope with respect to the subject NP *some bassoonist*. In (39b) only the narrow scope reading for the object NP is possible. The reason for this is said to be that reconstructing (at the level of LF) a VP containing the NP *every sonata* and the variable it binds will yield a well-formed logical representation (40a). If the object NP is raised to IP for the wide scope reading, an unbound variable will result when the VP is reconstructed, as shown in (40b).

- (40) a. [_{IP} some bassoonist; [_{IP} _{t_j} [_{VP} every sonata; [_{VP} played _{t_i}]]]]] and Otto didn't [_{VP} every sonata; [_{VP} played _{t_i}]]]
- b. [_{IP} every sonata; [_{IP} some bassoonist; [_{IP} _{t_j} [_{VP} played _{t_i}]]]]] and Otto didn't [_{VP} played _{t_i}]

In (40b) the second occurrence of _{t_i} is left unbound, since it is outside the scope of *every sonata*, which is limited to the first conjunct.

The account of quantifier scope that I have developed so far makes two claims. First, the domain of existential closure is the VP; and second, NPs that are outside VP at the point of tree splitting are mapped into restrictive clause structures. I have not defined what constitutes being “inside” or “outside” the VP, relying only on purely intuitive notions of containment and inclusion. The VP-deletion facts indicate that some more careful explication of the tree-splitting procedure is necessary. One particular question to be answered is this: Is quantifier adjunction to VP ruled out by the Mapping Hypothesis? To answer this question, we need to specify more explicitly what is “inside the VP” in the context of adjunction, since it is clear that we do not want to map QRed phrases such as the NP *every sonata* in (40b) into the nuclear scope of the logical representation.

May (1985) and Chomsky (1986a) discuss adjunction structures and the formal problems they raise with respect to relationships such as domination and containment, or inclusion. Both May and Chomsky assume that in an adjunction structure the category adjoined to a maximal projection is neither dominated by, nor included in, that projection. Adjunction thus creates a projection consisting of “segments,” and the resulting segmented projection dominates only those categories that are dominated by all segments of the projection. This leads to a precise definition of the concept of *inclusion* in terms of this revised conception of dominance:

- (41) α includes β if and only if β is dominated by every segment of α .

Thus, in (40b) the VP-adjoined quantifier phrase is not included in the VP. If the informal characterization “inside the VP” is defined as “included in

VP,” then adjunction to VP will not create any problems with regard to correctly forming the nuclear scope of the logical representation. Additionally, the notion “outside the VP” can be correspondingly clarified as “not included in VP,” allowing for the correct correspondence with restrictive clause formation.²⁷ The answer to the question concerning VP-adjunction of quantifiers is that quantifier raising to VP is possible (and needed) within the theory of quantifier interpretation I have developed here, and the Sag-Williams-May analysis of the contrast in (39) can be retained.²⁸

3.3.4 The Ambiguity of Weak Quantifiers in German

The syntactic account of the cardinal/presuppositional contrast that I have proposed carries with it the obvious implication that there is a close connection between the [Spec, IP] position (or anything not included in VP, in the case of adjunction) and presuppositional NPs. In this section I will look more closely at this connection, drawing on data from German.

The close connection between the [Spec, IP] position and presuppositional NPs predicts a close relation between the position of the subject and the ambiguity of weak determiners. In other words, the position of the subject should affect the interpretation of an NP with a weak quantifier. In English this correlation between subject position and interpretation is obscured by the fact that all subjects must appear in [Spec, IP] at S-structure. The alternation of interpretations and subject positions can only appear at the abstract level of LF (after LF lowering can apply). The fact that subjects can appear in either of the two positions at S-structure in German ([Spec, IP] and [Spec, VP]), coupled with the fact that tree splitting can reflect S-structure word order in German (as was shown by the bare plural facts presented in chapter 2), predicts that there should be an alternation between the cardinal and presuppositional readings of a weak determiner on a subject NP depending on the S-structure position of the NP.

In the following examples I show a case where the position of the subject alternates with respect to sentential particles, similar to the case I discussed in chapter 2 with respect to bare plural subjects. Recall that sentential particles can appear either to the left or to the right of the subject NP:

- (42) a. ... *weil* ja doch zwei Cellisten in diesem Hotel abgestiegen sind.
since ‘indeed’ two cellists in this hotel have-taken-rooms
- b. ... *weil* zwei Cellisten ja doch in diesem Hotel abgestiegen sind.
since two cellists ‘indeed’ in this hotel have-taken-rooms

I will assume that when the subject appears to the right of the particles it is in [Spec, VP], and when it appears to the left of the particles it is in [Spec, IP], as I argued in chapter 2. Thus, the particles serve to diagnose the position of the subject. Varying the position of the subject in this way does in fact lead to an alternation in the interpretation of the subject NP *zwei Cellisten* ‘two cellists’. In (42a), with the subject NP in [Spec, VP], the cardinal reading is most salient. The sentence in (42a) asserts the existence of two cellists who have taken rooms in this hotel. This is not unexpected, since the tree-splitting algorithm will map the subject occupying the [Spec, VP] position into the nuclear scope of the logical representation, giving rise to the existential, or cardinal, reading.

In (42b), on the other hand, the subject NP is in [Spec, IP]. Here the presuppositional reading obtains. In this case the two cellists are two of some larger set of cellists. The context situation might be one in which a busload of cellists has arrived in town (perhaps for a Villa-Lobos festival), and two of the cellists are staying in this hotel, four more at a local bed-and-breakfast, another with an aunt, and so on.²⁹ The presuppositional reading is thus associated with the outer, [Spec, IP] subject position. Again, this is not a surprising result, given the workings of the Mapping Hypothesis. The indefinite subject in [Spec, IP] is mapped into a restrictive clause by tree splitting. This restrictive clause represents the existential presupposition of the subject NP, resulting in the contrast in interpretation between (42a) and (42b).³⁰

Summarizing the results of the preceding subsections: I presented a variety of evidence in support of the syntactic account of the cardinal/presuppositional contrast that I proposed in the beginning of this chapter. The association of presuppositionality with restrictive clause formation via the operation of tree splitting predicts that there should be a close connection between presuppositionality and quantifier raising, which involves adjunction to IP. This prediction was borne out by the case of ACD constructions in English, in which grammaticality depends on the application of QR. The relationship between restrictive clause formation and the presuppositional interpretation of indefinites also suggests that there should be a connection between [Spec, IP] and presuppositional readings of indefinites. The German data concerning the interpretation of indefinite subjects show that there is in fact a contrast between [Spec, IP] and [Spec, VP] with respect to the interpretation of indefinites.

3.4 Dutch Subjects, Turkish Objects, and “Specificity”

So far in this chapter I have focused on the existence of two particular readings for indefinites, a cardinal (existential closure) reading and a presuppositional or quantificational reading. In this section I extend my treatment of presupposition and the interpretation of indefinites to a number of semantico-syntactic phenomena that have been described in terms of the notion of “specificity.” The data concerned are from Dutch and Turkish and have been described and analyzed by Reuland (1988) and Enç (1991).

The exact nature of specificity has been the subject of some debate. An initial point of controversy concerns whether specificity is actually a semantic notion (as suggested by Donnellan (1966) and others) or whether it is more properly treated as a matter of pragmatics (as suggested by Kripke (1977) and also Ludlow and Neale (1991)). My approach here will be from the viewpoint of the interactions between the syntax and specific interpretations of NPs. Since specificity does in fact correlate with a number of syntactic phenomena such as word order and case marking in a number of languages, it is reasonable to take the semantic approach to specificity, since syntactic effects might be unexpected under an account in terms of pragmatics. Additionally, any semantic account of specificity will have to explicate how the connection to the syntactic reflexes of specificity is to be made, or how specificity is to be represented in the mapping from syntax to semantics.³¹

In the following sections I will reexamine some cases of specificity presented by Reuland and Enç and show that they can be nicely accommodated into the account of presuppositionality and quantifier raising that I have developed in this chapter. In other words, the various facts described by Reuland and Enç can be explained by regarding the essential semantic contribution of “specificity” as being in fact presuppositionality. This approach has the very interesting result that the concomitant syntactic reflexes of specificity, such as word order in Dutch and case marking in Turkish (which remain mysterious on purely semantic or pragmatic accounts of specificity), end up being explained by the syntactic connection between presuppositionality and restrictive clause formation effected by the tree-splitting procedure.

3.4.1 Dutch Indefinite Subjects

Indefinite subjects in Dutch have a number of interesting syntactic and semantic properties (see Kerstens 1978, De Haan 1979, Bennis 1986,

Reuland 1988, and Rullmann 1989). Before considering the data regarding what have been called “specific” NPs, I will present some more basic facts concerning the interpretation of indefinite subjects in Dutch. These facts have been discussed by a number of researchers, as noted in the references given above. Though I take most of the examples in this section from Reuland 1988, I believe most (if not all) of the descriptive generalizations presented below can be attributed to the other authors as well (although the theoretical explanations of course vary).

As in German, the interpretation of bare plural subjects in Dutch varies with their syntactic position. In particular, Reuland notes the following paradigm concerning the syntax and semantics of bare plural subjects in Dutch:

- (43) a. *Fred denkt dat koeien op het dak liggen.
Fred thinks that cows on the roof lie
- b. Fred denkt dat er koeien op het dak liggen.
Fred thinks that there cows on the roof lie
'Fred thinks that there are cows lying on the roof.'
- c. Fred denkt dat koeien lui zijn.
Fred thinks that cows lazy are
'Fred thinks that cows are lazy.'

Looking only at the embedded clause portions of the sentences in (43) (I restrict myself to embedded clauses in order to avoid the complications brought about by the verb-second constraint in Dutch), we can see that there is a contrast in the acceptability of the bare plural subject *koeien* ‘cows’. (43a) shows that the bare plural subject is ungrammatical in the initial position of an embedded clause with a locative predicate. This contrasts with (43b), in which the bare plural subject in the embedded clause is immediately preceded by an expletive *er* ‘there’. In this case the sentence is grammatical, and the bare plural has an existential interpretation. Finally, (43c) shows that a clause-initial bare plural subject is grammatical in the case of a predicate denoting a more or less permanent state such as *lui* ‘lazy’. Not surprisingly, in this context the sentence is interpreted as a generic statement about cows.³²

In considering the derivation of the logical representations of the sentences in (43), I will follow Reuland in assuming that the [Spec, IP] position *cannot* be empty at S-structure in Dutch (that is, Dutch does not permit null expletives). I will also assume that Dutch is like German in that the tree-splitting operation must occur at S-structure (or, stated differently,

indefinite subjects cannot undergo LF lowering in Dutch). Given these assumptions, the logical representations of the embedded clauses in (43) are as follows:

- (44) a. * $\text{Gen}_x [x \text{ is a cow}] x \text{ is on the roof}$
- b. [er] $\exists_x x \text{ is a cow} \wedge x \text{ is on the roof}$
- c. $\text{Gen}_x [x \text{ is a cow}] x \text{ is lazy}$

The representation in (44a) corresponds to the ungrammatical sentence in (43a). In this case the bare plural subject, which must be in [Spec, IP] since it appears leftmost in the clause, is mapped into a restrictive clause, where it is then bound by the generic operator *Gen* (see Wilkinson 1986, Gerstner and Krifka 1987, and the discussion in chapter 2 of this monograph). This leads to a generic interpretation of the subject. However, this generic interpretation is pragmatically incompatible with the locative predicate ‘on-the-roof’, leading to the judgment of ungrammaticality seen in (43a).³³

In (43b) the [Spec, IP] position is filled at S-structure by the expletive *er* ‘there’. The lexical subject *koeien* ‘cows’ thereby occupies the VP-internal subject position. Tree splitting in this case maps the bare plural subject ‘cows’ into the nuclear scope, and the restrictive clause is filled by the expletive, which may function as a “locative presupposition” (see Bennis 1986). This yields an existential reading for the bare plural subject, since it is in this case bound by existential closure (see (44b)). This existential reading is compatible with the locative predicate; therefore, unlike (43a), (43b) is grammatical.

Finally, in (43c) the bare plural subject is in the external subject position [Spec, IP], as in (43a). The subject is mapped by the tree-splitting procedure into a restrictive clause, where it is bound by the generic operator to yield the generic reading, as shown in (44c). But unlike the case of (43a), the generic reading of the subject is quite compatible with the individual-level predicate ‘is-lazy’.

Thus, the contrasts in interpretation noted in (43) are explained by the Mapping Hypothesis plus two additional assumptions: the [Spec, IP] position cannot be empty in Dutch, and tree splitting occurs at S-structure in Dutch. Thus, when no NP or PP fills the [Spec, IP] position, it is filled by the expletive *er*. In this case the (lexical) subject appears in the VP-internal subject position. As a result of the tree-splitting algorithm, this syntactic fact about Dutch leads to a peculiar semantic property of indefinite subjects in that language. Indefinite subjects in the clause-initial ([Spec, IP]) position must be interpreted as forming a restrictive clause, and they

will only be grammatical in those cases where such an interpretation is plausible.

This direct association between the [Spec, IP] position and the restrictive clause interpretation of a bare plural subject (as opposed to the VP-internal existential closure interpretation) leads to the expectation that a similar contrast in interpretation should arise with other indefinite subjects (in addition to the bare plural). Turning now to subjects with weak quantifiers (which in English are ambiguous between the restrictive clause and existential closure interpretations), we see the following difference in interpretation with respect to the S-structure position of the subject (again, these examples are adapted from Reuland 1988, but similar examples are also found in Kerstens 1975):

- (45) a. Fred denkt dat [_{IP} twee koeien op het dak liggen].
Fred thinks that two cows on the roof lie
‘Fred thinks that two (specific) cows are lying on the roof.’
- b. Fred denkt dat [_{IP} er [_{VP} twee koeien op het dak liggen]].
Fred thinks that there two cows on the roof lie
‘Fred thinks that there are two cows lying on the roof.’

The sentences in (45) are identical except that in (45a) the embedded subject NP *twee koeien* ‘two cows’ appears in [Spec, IP], whereas in (45b) [Spec, IP] is occupied by *er* ‘there’, and the lexical subject NP is in the VP-internal subject position [Spec, VP]. Reuland claims that the subject NPs in the two sentences differ in interpretation. In (45a), with the external subject, no existential reading is possible. The only possible reading is what Reuland calls a “specific” reading. In (45b), with the subject in the VP-internal position, the subject NP has an existential reading.

The examples in (45) show that the VP-internal subject position is associated with an existential reading. This is not at all surprising given the discussion so far. A VP-internal subject maps into the nuclear scope, where it is bound by existential closure. What remains to be determined is the exact nature of the “specific” reading that Reuland associates with the subject NP in the VP-external subject position. By analogy to the bare plural examples, we would expect that the VP-external interpretation would show properties characteristic of restrictive clause formation. Rullmann (1989) provides the empirical evidence needed to make this connection. Rullmann’s examples show that the nature of specificity becomes quite clear when these “specific” NPs are placed in appropriate discourse contexts that highlight the relevant semantic property involved. One of Rullmann’s examples is given in (46).³⁴

- (46) Toen ik de bibliotheek in wilde gaan werd de ingang geblokkeerd door een groep studenten.

'When I wanted to enter the library, the entrance was blocked by a group of students.'

Ik hoorde later dat *twee studenten* gearresteerd waren.

I heard later that students arrested were

'Later I heard that two (of the) students had been arrested.'

The second sentence in the discourse given in (46) contains an indefinite subject NP, *twee studenten* ‘two students’, in the embedded clause. The absence of an expletive *er* to the left of the subject indicates that the subject occupies the [Spec, IP] position. In the context provided by the preceding sentence, the subject NP *twee studenten* must have a partitive reading in which the two students are two of those previously mentioned that blocked the library entrance. (Rullmann calls these examples “concealed partitives.”) In my earlier discussion of the ambiguity of indefinites I claimed that paraphrasability as a partitive is one indicator of the property that I have called presuppositionality. If this is the case, then Rullmann’s “concealed partitives” show that the “specific” reading observed by Reuland actually involves the notion of presupposition.³⁵ The specific indefinites in these examples are indefinites that receive a presuppositional, restrictive clause interpretation in which the determiner functions as an operator (it has quantificational force of its own). The nonspecific indefinites are existential closure indefinites. These NPs have no quantificational force, and their determiners function as cardinality predicates.³⁶

This approach to the specificity contrast in Dutch indefinite subjects is further supported by the syntactic nature of the contrast—it is the syntactic positioning of the subject that yields the contrast. The parallel between Reuland’s observations and the syntax of weak determiner ambiguity becomes clear. The weak NP *twee studenten* in [Spec, IP] is presuppositional, as indicated by its “partitive” interpretation. Its presuppositional interpretation is semantically represented by the subject being mapped into a restrictive clause in the logical representation (which is in fact required by the Mapping Hypothesis). When the subject NP is in [Spec, VP], as in (45b), it can only have an existential interpretation. This is again expected given the Mapping Hypothesis, which maps the VP-internal subject into the nuclear scope of the logical representation, yielding only the existential reading. Thus, Reuland’s examples can be regarded as somewhat parallel to the German examples involving the ambiguity of weak determiners given in section 3.3.4.

In conclusion, the presuppositionality of indefinite subject NPs is syntactically marked in Dutch. Presuppositional subject NPs appear in the outer, [Spec, IP] position, and nonpresuppositional, or cardinal, subject NPs appear in the inner, [Spec, VP] position. This supports the Mapping Hypothesis in that the notion of presupposition and restrictive clause formation is shown to be linked to the [Spec, IP] position. The connection between [Spec, IP] and presupposition is made by the tree-splitting procedure, which maps indefinites at the IP level into restricted quantifier structures. This approach also explains two commonly noted aspects of the “specific” reading of indefinite subjects in Dutch: its semantic relation to “partitive” NPs, and its syntactic association with the [Spec, IP] subject position.

3.4.2 Turkish Objects

There are other syntactic mechanisms that languages can make use of to mark the presuppositionality (or lack thereof) of an NP. In this section I consider an instance of syntactic marking of presuppositional NPs from Turkish (based on data from Enç 1991). Unlike the case of Dutch subjects, in which the presuppositional reading was marked by placement of the indefinite NP clearly outside of the VP, the presuppositionality of the Turkish NPs is marked, not by their syntactic position, but by morphological case marking.

In Turkish, object NPs may or may not be morphologically marked for case. In particular, object NPs may appear either with the accusative case marker suffix *-yi*, or they may be bare, with no morphological case marking at all. What is interesting about this optionality of case marking is that it has semantic effects. Enç (1991) observes that the presence or absence of the accusative case marker produces a corresponding alternation in the semantic interpretation of the object NP, with the notion of “specificity” once again coming into play. To illustrate this effect, I give the examples in (47), with Enç’s translations.

- (47) a. Ali bir kitab-i aldi.
 Ali one book-ACC bought
 ‘A book is such that Ali bought it.’
- b. Ali bir kitap aldi.
 Ali one book bought
 ‘Ali bought some book or other.’

In (47a) the object NP *kitab* ‘book’ is marked with accusative case. In this sentence the object NP can have only what Enç calls a “specific”

reading. In (47b) there is no case marker on the object NP, and in this case the object has a nonspecific, or existential, reading. Thus, Enç claims that Turkish indefinite objects are not ambiguous between specific and non-specific interpretations (as English indefinites are), but are in fact disambiguated by the presence or absence of the accusative case marker.³⁷

Although the syntactic mechanism involved in disambiguation is clearly different, this semantic alternation of a “specific” and an existential reading of object NPs looks rather like Reuland’s description of the facts concerning the interpretation of Dutch subjects. And once again, these examples raise the question of what it means for an NP to be specific in this sense. Enç discusses the nature of specificity and reaches the conclusion that specificity must be described in terms of a feature [\pm specific] (represented as an additional index indicating definiteness). NPs that are marked [+ specific] (such as object NPs bearing morphological case marking) must satisfy a Familiarity Condition, which basically requires that there be a discourse referent corresponding to the [+ specific] indefinite (the Familiarity Condition is based on ideas in Heim 1982).

At this point it is not yet clear how this analysis of the “specific” reading should be related to the sorts of interpretations of indefinites developed here. Enç gives some additional data, however, that suggest that the account of “specificity” in these contexts could in fact be developed in terms of the analysis of indefinites that I have been developing here. In illustrating the difference between the two readings ([\pm specific]), Enç introduces sentences embedded in a discourse. Not surprisingly, these contexts look very much like Rullmann’s “concealed partitives”:

- (48) a. Odam-a birkaç çocuk girdi.
my-room-DAT several child entered
'Several children entered my room.'
- b. İki kız-i tanıယordum.
two girl-ACC I-knew
'I knew two girls.'
- c. İki kız tanıယordum.
two girl I-knew
'I knew two girls.'

In the context that is established by (48a), either (48b) (with accusative case marking on the object NP) or (48c) (no morphological case on the object NP) can follow. The difference in case marking corresponds to a difference in interpretation. In the case of the accusative-marked NP, the two girls must be two of the girls who entered the room. If no case

marker appears on the object NP, as in (48c), the two girls are two *additional* girls. Thus, the accusative case marking induces a concealed partitive reading for the object NP. In other words, the “specific” reading once again involves the notion of presupposition in that the “specificity” signaled by the accusative case marking corresponds directly to the formation of a restrictive clause that represents the set introduced in the preceding discourse.

As further evidence in support of this approach to the Turkish facts, it is interesting to note that object NPs that have unambiguously strong (or presuppositional) determiners also require the morphological accusative marker:

- (49) a. Ali her kitab-i okudu.
Ali every book-ACC read
'Ali read every book.'
- b. *Ali her kitap okudu.

Thus, the generalization that emerges from the data is that presuppositional object NPs are distinguished from nonpresuppositional objects in that they must be morphologically marked with accusative case. Consequently, object NPs with weak determiners (that is, determiners that are in principle ambiguous between presuppositional and cardinal (existential) readings) receive accusative case marking only in presuppositional contexts such as that illustrated in (48).³⁸

The Turkish facts provide another illustration of the fact that “specificity” in indefinites can be assimilated to the properties of the presuppositional readings that I have discussed above. As illustrated by both the Dutch and Turkish facts, the primary distinguishing property between specific and nonspecific indefinites is restrictive clause formation, in correspondence to the treatment of the ambiguity of indefinites given in section 3.2.3.

Turkish is also like Dutch in that the presuppositionality of NPs is syntactically marked. Whereas in Dutch this property is indicated positionally within the clause, in Turkish it is marked by the presence or absence of the accusative case marker. This raises the question of how the Turkish facts can be related to the Mapping Hypothesis. The problem is that accusative case marking (presumably a VP-internal process) correlates with restrictive clause formation, whereas the Mapping Hypothesis associates restrictive clause formation with NPs that are VP-external. There are two possible ways of approaching this dilemma.

The first approach simply calls into question the VP-internal nature of accusative case marking, following the lines of recent research in the framework of the expanded phrase structure of Pollock (1989) in which Infl is “exploded” into a number of functional heads. A number of researchers (see Van den Wyngaerd 1989 and Mahajan 1990, among others) have suggested that object NPs can actually move at S-structure out of the VP to the specifier of a functional head (e.g., [Spec, AgrO], following Chomsky (1991)) in order to receive accusative case. On this approach the presence of morphological case marking would actually signal a VP-*external* object, which would naturally be mapped into a restrictive clause by the Mapping Hypothesis. On this approach Turkish would be rather like German and Dutch in that the S-structure representation would map quite directly into the logical representations.

Another possibility is to simply assume that the accusative case marker in Turkish acts as an S-structure trigger for LF movement (e.g., QR) of an object NP. Object NPs that are not marked with accusative case do not trigger QR and therefore can receive only the VP-internal existential closure interpretation.³⁹ I will leave this issue open for now; it is not clear that much hinges on the choice taken at this point. In the next chapter I examine the interpretation of indefinite objects in English and German in more detail. In the case of German in particular the role of S-structure scrambling of NPs in determining semantic interpretation may be relevant to the ultimate choice of explanation for the Turkish data.

3.5 Some Final Remarks on the Nature of Specificity

The characterization of “specific” indefinites as being presuppositional, and therefore essentially quantificational, runs afoul of claims made by Fodor and Sag (1982) to the effect that specific indefinites show certain properties that preclude a quantificational analysis. Among the properties that Fodor and Sag demonstrate as evidence for a referential rather than quantificational analysis of indefinites are (1) the ability of indefinites to escape “scope islands,” (2) the absence of certain “intermediate” scope readings with specific indefinites, and (3) the ability of specific indefinites (unlike other quantifiers) to appear in weak crossover configurations. I will deal with the weak crossover data in chapter 4, so I will confine myself here to commenting briefly on the other two properties. I also will not consider in any detail arguments concerning the viability of a referential analysis of indefinites beyond the matter of scope phenomena (but see Kripke 1977 and Ludlow and Neale 1991 for more extensive discussion),

but will simply consider the question of whether Fodor and Sag’s scope observations do in fact rule out a quantificational analysis.

Fodor and Sag note that in certain contexts (such as being embedded under propositional attitude verbs) specific indefinites seem to be able to take wider scope than is possible for other quantifiers:

- (50) a. A man in Arizona thinks that every Gila monster in New Mexico emigrated to Canada.
- b. Every man in Arizona thinks that a Gila monster in New Mexico emigrated to Canada.

Whereas in (50b) the indefinite *a Gila monster in New Mexico* can take scope over the NP *every man in Arizona*, a universally quantified NP in the same position (as in (50a)) cannot take widest scope. One minor problematic aspect of this observation is that a full range of indefinites seem to share this property of being able to take wide scope (Ludlow and Neale 1991):⁴⁰

- (51) a. Every man in Arizona thinks that three Gila monsters in New Mexico sang at the Santa Fe Opera.
- b. Every man in Arizona thinks that several Gila monsters in New Mexico sang at the Santa Fe Opera.
- c. Every man in Arizona thinks that some Gila monsters in New Mexico sang at the Santa Fe Opera.

Additionally, although these facts are interesting, it is not clear that an explanation of them in and of itself necessarily rules out a quantificational analysis of indefinites.

What Fodor and Sag take as a more decisive argument against the quantificational analysis is an apparent limitation of scope possibilities for indefinites in sentences like the following:

- (52) Each student overheard the rumor that a gila monster of mine drowned.

Fodor and Sag claim that the indefinite *a Gila monster of mine* can only take a narrowest scope and a widest scope reading, with the intermediate scope reading being impossible, as sketched out in (53).

- (53) a. $\exists_x [x \text{ is a Gila monster}] \text{Every}_y [y \text{ is a student}] y \text{ overheard the rumor that } x \text{ drowned}$
- b. * $\text{Every}_y [y \text{ is a student}] \exists_x [x \text{ is a Gila monster}] y \text{ overheard the rumor that } x \text{ drowned}$

- c. Every, [y is a student] y overheard the rumor that \exists_x [x is a Gila monster] x drowned

Such a limitation would not be at all expected on a quantificational analysis. Fodor and Sag reason that if quantificational specific indefinites could somehow escape scope islands, then intermediate readings such as that represented in (53b) should also be possible. The full range of scope possibilities should be allowed. Since the intermediate reading is not available for (52), Fodor and Sag conclude that the apparent wide scope reading of the indefinite noted in (50) and (51) is actually a referential reading, rather than being quantificational in nature.

The problem here is that it is not at all clear that the absence of the reading in (53b) is due to the properties of the indefinite itself. There are in fact various strategies that can be applied to bring out the missing reading. One approach centers on the semantics of the head noun of the complex NP. As Ludlow and Neale (1991) point out, the noun *rumor* is problematic in that it may be difficult to discriminate individual instances of the same rumor, making scope interactions with distinct occurrences of a single rumor difficult to tease apart. As they demonstrate, if the noun is changed to *report*, intermediate scope or the indefinite becomes more apparent:

- (54) Every student overheard three reports that a Gila monster of mine drowned.

Angelika Kratzer takes a different approach to bringing out the missing intermediate reading (see Rullmann 1989: fn. 7). She observes that the intermediate reading can be pragmatically forced in certain contexts. As an example she points out that the indefinite NP in the following sentence clearly can take intermediate scope:

- (55) Each writer overheard the rumor that she didn't write a book she wrote.

Since there can be no self-contradicting rumors, *a book she wrote* must have scope outside of *the rumor* . . . , but it is at the same time within the scope of *each writer*. Thus, there are in fact “intermediate” readings of specific indefinites.

In summary, although the explanation of the scope properties of specific indefinites is by no means complete, the case against a quantificational analysis of specific indefinites is not completely persuasive. Additionally, the quantificational account I have developed has an advantage in that

it permits an explanation of the various syntactic correlations with specificity noted in the preceding sections.

3.6 Conclusion

Investigating more closely the tree-splitting algorithm for mapping syntactic representations (assuming the VP-Internal Subject Hypothesis) to semantic representations from the point of view of the interpretation of indefinite NPs has led to the conclusion that there are actually two different kinds of indefinites, cardinal and presuppositional. Cardinal indefinites are essentially “existential closure indefinites” in that they receive their quantificational force from the operation of existential closure. Presuppositional indefinites form restrictive clause structures and therefore undergo the rule of QR.

In an extension of this initial proposal, I proposed that this distinction plays an essential role in characterizing the strong/weak distinction of Milsark (1974). In particular, I showed that the strong/weak contrast actually has a syntactic basis in that it results from the differential treatment of VP and IP in the derivation of logical representations from the intermediate syntactic level of LF. One consequence of this approach is that the presuppositional/nonpresuppositional contrast between strong and weak determiners noted by Milsark follows straightforwardly, as do the relative scope preference facts discussed by Ioup (1975).

This syntactic characterization of the strong/weak distinction in terms of presupposition also explains facts concerning antecedent-contained deletions. ACD requires that the object NP undergo QR (May 1985). Thus, ACD acts as a test for whether or not an NP must undergo QR, differentiating presuppositional and cardinal NPs— indefinites in ACD contexts must always receive the presuppositional interpretation.

Finally, I discussed the notion of “specificity” as it is used in a number of discussions of the interpretation of indefinites, and concluded that this idea of specificity corresponds quite directly to the concept of presuppositionality I had used to distinguish the two types of indefinites. In the next chapter I will take a closer look at the two possible interpretations for indefinites and show how they interact with extraction phenomena.

15. Having the contrast hinge on the nature of the Infl involved raises the question of what component of Infl is relevant to this contrast, especially in light of recent accounts of clause structure that make use of articulated inflectional heads, following the lead of Pollock (1989). Since there are contrasts between the two types of predicates with infinitival clauses (briefly discussed in note 17), this suggests that it may not be tense that is relevant. The contrast may therefore turn on properties of Agr.

16. This reading is sometimes thought to require an accent on the verb *hate* (Manfred Krifka, personal communication). Although it is true that such a focus pattern will force the generic reading of the object, I think that the intended reading can also arise quite easily with neutral focus, as in the following context:

- (i) Q: Why don't cellists like to play Pachelbel?
 A: For one thing, cellists hate boring bass lines.

The effects of focus on NP interpretation will be discussed more extensively in a later section.

17. This raises the question of how small clause complements are to be interpreted. If the VP is the domain of existential closure, it is expected that bare plurals within small clauses would be "caught" by existential Closure and given an existential reading. This is not always the case. The existential reading does not seem to be available for subjects of small clause complements of *consider*:

- (i) a. I consider firemen available. (generic only)
 b. I consider firemen intelligent. (generic only)

Exceptional case marking (ECM) verbs seem more or less to allow both existential and generic interpretations of complement subjects:

- (ii) a. I believe firemen to be available. (both generic and existential)
 b. I believe violinists to be intelligent. (generic only)
 c. ??I believe opera singers to know Hittite.

For-clauses also allow both readings:

- (iii) a. For firemen to be available is the least we should expect. (ambiguous)
 b. For violinists to be intelligent is the least we should expect. (generic)

With-clauses, on the other hand, do not seem to permit a generic reading, and they are generally bad with individual-level predicates:

- (iv) a. With firemen available, we are well protected against immolation.
 b. *With firemen intelligent, we have nothing to fear.

Though I have no explanation at this point for this range of variation, the possibility of generic readings points to a clausal constituent structure for the complement in (i) (Chomsky 1981, Stowell 1981, Safir 1983; contra Williams 1983), resulting in an embedded tripartite logical representation.

18. I restrict myself to embedded contexts to avoid complications brought about by the application of the verb-second constraint. Specifically, unlike subject raising to [Spec, IP] in German, topicalization to [Spec, CP] seems to always permit "reconstruction effects" in the interpretation of the topicalized elements.

19. It may appear from this description that the split-topic construction is actually a case of quantifier floating, as analyzed by Sportiche (1988). But quantifier floating in German and split topics actually have rather different properties. One major difference is that split topics *only* arise by topicalization in conjunction with verb-second word order, whereas quantifier floating can occur in non-verb-second clauses in conjunction with scrambling. See Fanselow 1987 and Giusti 1990 for more discussion of the properties of German quantifier floating.

20. Koopman and Sportiche (1988) make a similar assumption with respect to government: "if an X⁰ governs a YP, it governs the Specifier of YP" (p. 16). See also Bonet 1989 for a discussion of case assignment to [Spec, VP] via a similar mechanism. One potential problem with this extension of Spec-head agreement is that this predicts that extraction from an ECM subject should be acceptable (as claimed by Chomsky), which is debatable:

- (i) a. ?Who do you believe pictures of to be on sale?
 b. *Who are pictures of on sale?

Although I believe that there is a contrast between (ia) and (ib), the acceptability of (ia) is somewhat degraded.

21. This raises the question of why L-marking should matter after LF lowering for a movement relation established at S-structure. I will discuss this question in detail in chapter 4.

22. This fact is pointed out by Moltmann (1991) as evidence against the hypothesis that the relevant factor in determining the acceptability of extraction is the stage/individual contrast.

23. Thanks to David Pesetsky for encouraging such flights of imagination.

24. A third question is how to represent the narrow "contrastive" focus on subject NPs such as in (75a). For present purposes, it is enough to assume that we need to distinguish two types of focus: contrastive and presupposition-inducing (contrary to Rooth 1991). Only the presupposition-inducing focus constructions are to be represented in tripartite logical representations of the sort derived by tree splitting. Thus, the contrastive cases do not bear on the viability of the Mapping Hypothesis.

Chapter 3

1. Partee (1978) and Cooper (1979) discuss similar problems in the interpretation of pronouns. See also Neale 1990 for a more recent examination of these issues.
2. The question of exactly *how* the E-type pronouns acquire the necessary descriptive content is a tricky one. I will not attempt to answer this question here, but will simply refer the reader to the discussions of this matter in Kadmon 1987 and Heim 1990.
3. I am ignoring for the moment sentences that contain a quantificational adverb. These sentences will be considered in detail in chapter 4.
4. The presuppositionality described by Milsark seems to correspond to what Soames (1989) calls "pragmatic presupposition," which can be thought of as what is taken for granted by speakers and hearers in a conversation.

5. The literature contains numerous discussions of the semantics of weak and strong determiners. In the framework of “generalized quantifiers” these include (to give a very abbreviated selection): Barwise and Cooper 1981, De Jong and Verkuyl 1985, and Partee 1988. Within the context of Government-Binding Theory, they include (among others) Higginbotham 1987 and Reinhart 1987.

6. For present purposes, I will make do with this rough characterization. A more complete account of partitivity would require some refinements. For example, De Hoop (1990) claims that a partitive characterization is not correct for strong determiners in Dutch. Her objection is based on the fact that partitives can occur in *er*-insertion sentences in Dutch:

- (i) Er zitten twee van de drie katten in de tuin.
there sit two of the three cats in the garden

The occurrence of the partitive in an existential sentence may be limited to matrix (verb-second) environments, however. At least for some speakers, in embedded contexts the partitive in an existential is less acceptable (Hotze Rullmann, personal communication):

- (ii) *?... dat er twee van de drie katten in de tuin zitten.
that there two of the three cats in the garden sit

Thus, the Dutch data may well involve a syntactic difference between verb-second existentials and non-verb-second existentials rather than a cross-linguistic difference in the semantic characterization of the strong determiners.

Comorovski (1989) also discusses some cases in English where partitive NPs can occur in existential sentences with codas, and concludes that there are two factors at stake: the determiner involved and the “novelty” of the NP. In cases where the NP is novel, a partitive NP can occur in an existential sentence regardless of the determiner:

- (iii) There are all of yesterday’s exams to correct.

If the partitive phrase is somehow anaphoric to some element of the preceding discourse, only a weak determiner is allowed in the partitive NP:

- (iv) How many papers have you graded today?
There are still some/*most of them to grade.

This phenomenon is limited to existentials with codas, however, and it is interesting to note that De Hoop’s examples also all involve existential sentences with codas.

7. This description is somewhat simplified, since May 1977 and May 1985 differ in how relative scope is assigned, but that difference is not relevant to the discussion here.

8. One exception to this generalization is the analysis proposed by Hornstein (1984). Hornstein distinguishes three types of quantifiers on the basis of movement and binding considerations. His distinctions do not take into account the differences between strong and weak quantifiers, which all (with the exception of *any*) fall into the same class in his analysis.

9. A potential problem with regarding existential quantifiers as cardinality predicates was pointed out to me by Maria Bittner. The problem arises with quantifiers

like *at most three*. These are weak quantifiers in the sense that they can occur in *there*-sentences:

- (i) There are at most three piglets in the yard.

Analyzing *at most three* as a cardinality predicate in (i) can result in the wrong truth-conditions, for the sentence will be true even if there are five piglets in the yard, since there will exist a set of piglets whose cardinality is at most three. What is required here is a stipulation that the set denoted by the cardinality predicate be a maximal set, somewhat along the lines of the “scalar implicature” of Horn (1972) (see also Grice 1975). This problem is discussed in more detail by Kadmon (1987) and May (1989).

10. In arguing against Diesing 1988 and Kratzer 1989, De Hoop and De Swart (1990) claim that the “strong partitive interpretations” of indefinites with weak determiners (or the presuppositional readings, as I refer to them) cannot be explained by a Kamp-Heim-style variable analysis. They are assuming a uniform analysis of indefinites, however, so their objections in this regard in fact do not hold.

11. At this point for the sake of simplicity I will assume that the quantifier is a determiner, as in all the examples considered so far in this chapter. I will deal with adverbs of quantification and the generic operator in chapter 4.

12. The connection between presupposition and restrictive clause formation was also noted by Hausser (1973). As Berman points out, this effect of presuppositions of the sentence on the logical representation has been noted elsewhere in the literature as well—for example, by Belnap (1970) with regard to conditionals, and by Schubert and Pelletier (1989) with regard to generic sentences.

13. Of course, an indefinite taking the presuppositional reading will show a preference for wider scope. The significance of this fact will be discussed when I take up the issue of the so-called specific indefinites.

14. It must be mentioned in this connection that Carlson’s (1977b) observations about the bare plural suggest that bare plurals can *never* have a wide scope (e.g., QRed) interpretation. In the account of the interpretation of bare plurals developed in chapter 2 this need not be the case, and in chapter 4 I discuss a number of instances where bare plurals do in fact seem to undergo QR.

15. In a subsequent work May (1985) proposes that both readings of (12) should be given a single representation at LF, with the two readings being derived indirectly from the LF representation. It is not clear to me how this approach could be modified to take into account the effects of the presuppositionality contrast.

16. It is of course important to bear in mind that these representations are an abbreviated form of the derivation (see the discussion in chapter 1). In particular, Heim’s (1982) rule of Quantifier Construal is crucial to ensuring that the operators match up properly with their restrictive clauses.

17. This association of acts of creating with the nonpresuppositional reading will be considered in more detail in chapter 4.

18. Carlson actually characterizes the distinction in terms of a contrast between ordinary restrictive relatives and what he calls “amount relatives.” The amount

relatives (which correspond to the cases involving presuppositional NPs) differ from restrictive relatives in that they contain a quantifier phrase containing a strong NP, paralleling the analysis of comparatives in Bresnan 1973.

19. Given that weak quantifiers are ambiguous, it might be expected that the sentences in (26) would be grammatical, but only allowing the presuppositional reading for the determiner. This is in fact true for some speakers. Other speakers seem to find the ACDs in (26) awkward, which may be related to the oft-noted asymmetry between subjects and objects with respect to preference for a presuppositional reading. Subjects are strongly presuppositional, whereas objects favor nonpresuppositional readings.

Tense can also affect which reading arises most readily. For example, the present perfect seems to induce a presuppositional reading:

- (i) a. I have read many books that you have.
b. I have read two books that you have.

Both of the sentences in (i) give rise to the presuppositional reading of the object quite easily, in contrast to the examples given in the text.

20. A fact left unexplained by this analysis is that comparatives are quite acceptable in ACD contexts:

- (i) I read more books than you did.

The simplest approach would be to assume that comparatives require a QR (presuppositional) interpretation. It is not obvious how this would work, however. The comparative in (i) seems to clearly be comparing expressions of cardinality (i.e., the number of books read). The object NP is presuppositional in the sense that it is presupposed that books were read. I leave the question of how to incorporate the interpretation of comparatives into the account I have presented for further research.

21. It is not clear to me how Baltin derives the correct semantic interpretation of these sentences. There still seems to be a problem in recovering the deleted VP.

22. This difference between extraposition structures and ACDs was pointed out to me by Roger Higgins.

23. For some speakers extraposition from a strong NP may not be so bad as is indicated by the starred examples, although even these speakers find a contrast in that the unextraposed version is preferable.

24. Hasegawa (1988) presents arguments based on constituency tests that also show, independently of the considerations I have presented, that Baltin's extraposition analysis does not correctly derive the ACD structures.

25. The relevance of these facts to my analysis was pointed out to me by Robert May.

26. Hirschbühler (1982) raises some counterexamples to Sag's and Williams's generalization. In the following examples of VP-deletion the object NP quantified with *each* can take wider scope than the NP in subject position:

- (i) A Canadian flag was hanging in front of each window, and an American one was too.
- (ii) A kitty was sleeping in each corner, and a puppy was too.

These sentences seem to indicate that it is necessary for the quantified objects to raise to IP in order to take scope over their subjects. If this is so, then reconstruction of the deletion should not yield well-formedness, since an unbound variable will result. A reordering solution (in which VP-reconstruction would precede QR) would leave us without a satisfactory account of ACD, since in the case of ACD recovering of the deleted VP depends on the *prior* occurrence of QR. Hirschbühler's solution is to simply allow *each* to take scope over both conjuncts:

- (iii) [each corner_i [_{IP} a kitty was [_{VP} sleeping in t_i]] and [_{IP} a puppy was [_{VP} sleeping in t_i]]]]

This special treatment would also have to be extended to *every*, since wide scope is possible with objects quantified by *every* in these contexts as well:

- (iv) A kitty was sleeping in every corner, and a puppy was too.

The question, then, is whether sentences such as these are in fact a special case of some sort (perhaps due to special properties of *each*), or whether the wide scope reading can be accounted for by some more general means.

In examining both Sag's and Williams's examples on the one hand, and Hirschbühler's examples on the other, one important distinguishing characteristic comes to light. In the cases of VP-deletion where the object NP seems to be limited to narrow scope, the subject of the second conjunct is always a definite NP or a proper name:

- (v) a. Some bassoonist played every sonata, but Otto didn't.
b. Every lawyer liked some decisions, but the doctor didn't.

The subject NP in the second conjunct in the examples in (v) is arguably non-quantificational, in the sense that it does not exhibit scope interactions. Thus, the reason no across-the-board scope operations are possible in these examples may well simply be that they do not involve across-the-board quantification.

If this is the case, then VP-deletion sentences that involve quantificational (or for that matter, indefinite) NPs in both conjuncts should permit the across-the-board scope phenomena observed by Hirschbühler. This does in fact seem to be the case:

- (vi) a. Donkeys kicked every farmer and goats did too.
b. Bassoonists played every cantata and cellists did too.
c. Frogs jumped most fences and sheep did too.
d. Guinea pigs rode many trains and chinchillas did too.
- (vii) a. Every donkey kicked three of the farmers and several goats did too.
b. Two of the bassoonists played in every cantata and three of the cellists did too.
c. Every frog jumped several fences and most sheep did too.
d. Many guinea pigs rode every train and several chinchillas did too.

The sentences in (vi) and (vii) all seem to be ambiguous between wide and narrow scope for the object NPs. This is true of both strong NPs and weak NPs.

The question remains how the wide-scope-object readings are to be represented without resulting in the unbound variable problem. I'm not sure how to formalize this at this point, and I will leave it as a problem for further research.

27. Note that the relation of “not included in” is not equivalent to “excluded.” Exclusion is defined within the *Barriers* framework as the following:

(i) α excludes β if and only if no segment of α dominates β .

28. Allowing QR to adjoin VPs of course raises the possibility that the narrow scope presuppositional reading discussed in sections 3.2.5 and 3.2.6 is actually a result of adjunction to VP rather than IP. This may well be correct, but I will not pursue the possibility here.

29. The presuppositional reading can also reflect a more generalized application of presupposition accommodation in that the two cellists could be members of a presupposed set of musicians, rather than specifically cellists. In this case the additional presuppositions accommodated (that there is a set of musicians, and that cellists are musicians) are represented either abstractly (as in the case of the *I have stopped eating Brussels sprouts* example) or explicitly in the preceding discourse.

30. Strictly speaking, the particles act as only a partial diagnostic of the phrase structure position of the subject. Although the appearance of a subject to the *left* of the particles clearly indicates that the subject is in [Spec, IP], a subject to the *right* of the particles may be VP-external owing to the possibility of their scrambling and adjoining to IP (this possibility was also mentioned in chapter 2). The interpretation that results in this case is rather marked, and requires a particular intonation contour. With neutral intonation, only the VP-internal (existential closure) interpretation of the indefinite is possible. This of course does not rule out the syntactic characterization of the contrast, but merely indicates that there can be other factors involved as well.

31. There has also been a fair amount of diversity in the work on specificity that has been devoted to characterizing specificity in terms of particular semantic properties. For example, specificity has been described in terms of scope and referentiality (Fodor and Sag 1982, Partee 1972), “force” versus “sense” (Higginbotham 1987), Pesetsky’s (1982) notion of “D-linking” (Enç 1991), and Donnellan’s (1966) contrast between referential and attributive NPs (Moltmann 1991).

32. As noted by De Mey (1980), there are a number of additional factors that can come into play in determining interpretations of bare plurals in Dutch, which I will make no attempt to account for here. For example, tense plays a role in the interpretation of bare plurals in Dutch, just as it does in English. In addition, De Mey notes that quantificational variability can also arise in the presence of quantificational adverbs for both bare plural subjects and objects. I will discuss this sort of variability in English and German in chapter 4. It appears that much of that discussion may apply to the Dutch facts as well.

33. Of course, one could construct some sort of bizarre context in which being on the roof would be a generic property of cows that could conceivably result in grammaticality, but for the purposes of this illustration I will stick with the more usual sorts of situations involving cows and roofs.

34. Bennis (1986: 254, fn. 18) makes a similar point using coreference tests of the type discussed by Reinhart (1983). He notes that definite pronouns may refer to

presuppositional (VP-external) indefinites, but not to VP-internal (existential closure) indefinites:

- (i) a. De leraar wilde dat een jongen een meisje kuste, maar hij weigerde.
the teacher wanted that a boy a girl kissed but he refused
- b. *De leraar wilde dat er een jongen een meisje kuste, maar hij weigerde.
the teacher wanted that there a boy a girl kissed but he refused

35. Rullmann (1989) considers the possibility that the Dutch specific indefinites are actually referential expressions, along the lines proposed by Fodor and Sag (1982), but does not reach a conclusive decision in this matter. I discuss Fodor and Sag’s analysis in section 3.5.

36. Reuland actually describes the ambiguity of the indefinite NPs in terms of an NP-internal syntactic distinction as well. He claims that in the case of the presuppositional reading the specifier is interpreted as a determiner in the sense of Barwise and Cooper (1981), whereas in the case of the existential reading the specifier does not function as a determiner. A number of researchers have approached the ambiguity of weak determiners from the point of view of NP-internal syntax (see, for example, Bowers 1988 and Hudson 1989). This approach certainly deserves further attention, especially in light of expanded notions of NP structure due to Brame (1981) and Abney (1987), but I will leave the matter for future research at this point.

37. Morphological case marking (or the absence thereof) on direct objects produces alternations in semantic interpretations in a number of languages. Among these are Hindi (Mahajan 1990), Russian (Babby 1980, Pesetsky 1982, and Neidle 1988), and Finnish (Vainikka 1988, 1989). There is also a discussion of related phenomena regarding specificity in Hungarian in Szabolcsi 1986. Although the semantic effects of case marking vary among these languages (for example, in some instances aspect plays a role in determining the interpretation of an NP), the phenomena do seem to be related to the facts discussed by Enç (1991). Belletti (1988) has proposed an account of “definiteness effects” that is based on the distinction between structural and inherent case, motivated in part by the case distinctions in Finnish. Although there are problems with this approach to (in)definiteness (see, for example, Vainikka 1988), this is clearly an area that calls for more research.

38. Bare object NPs generally appear without case marking. One interesting exception is that of animate bare NPs. Erguvanlı (1984: 19) notes that in “statements of general truth” a bare animate NP must be marked with accusative case:

- (i) a. Ben insanlar-i severim.
I human beings-ACC, like
‘I like human beings.’
- b. *Ben insanlar severim.
I human beings like

This is clearly a case of a generic interpretation of the object of an experiencer verb, a phenomenon that was discussed briefly in chapter 2. The fact that bare objects

that have morphological case marking are interpreted generically is not surprising, since generics are also associated with restrictive clause formation. This fact (as well as the Dutch bare plural facts discussed in the previous section) may lead one to think that the association between presuppositionality and accusative case marking is not correct, since generics seem nonpresuppositional. In chapter 4 I discuss the issue of presuppositionality and generics and conclude (following an argument by Angelika Kratzer) that generics can indeed be regarded as presuppositional. Therefore, I will continue to regard the notion of presuppositionality as the correct generalization in these cases.

39. Another possible approach would be to regard the casemarker itself as being a strong determiner (D) (which would trigger QR) within the DP theory of NP syntax developed by Abney (1987). This is not so unreasonable as it might first seem, since Turkish is essentially a head-final language, and D, as head of the DP, could plausibly appear phrase-finally in the NP. See Tateishi 1989 for the suggestion that morphological case markers head DPs in Japanese.

40. Ludlow and Neale also note that it is not true that universally quantified NPs cannot escape “scope islands” induced by propositional attitude verbs because the reading where the NP *every Gila monster in New Mexico* takes narrow scope with respect to *a man in Arizona*, but wide scope with respect to *thinks*, is possible:

- (i) a. A man in Arizona thinks that every Gila monster in New Mexico won the lottery.
- b. $\exists_x [x \text{ is a man}] \text{ Every}_y [y \text{ is a Gila monster}] x \text{ thinks that } y \text{ won the lottery}$

Chapter 4

1. The discussion here is based on a February, 1990 class handout of Angelika Kratzer's entitled “Some Comments on Enç,” which is actually an overview of the various properties of different kinds of indefinites and their interpretations inspired by an early version of Enç 1991.

2. Generic sentences like those in (4), as well as definitional sentences like *A unicorn has one horn* are viewed as a problem for the presuppositional approach to determiner semantics by a number of researchers, including Lappin and Reinhart (1988). They do not consider the possibility of exploiting a modal approach to genericity, however.

3. I have no explanation for why there is an increase in acceptability with the plural definite in (8e).

4. Hestvik (1990) claims that Fiengo and Higginbotham's specificity distinction is actually due to the fact that specific NPs are complete functional complexes (CFCs; see also Chomsky 1986b), whereas nonspecific NPs are not. Hestvik makes this claim in a discussion of binding principles, in which he suggests that the binding domain for x is the minimal CFC containing x . In support of this, he notes the following contrast:

- (i) a. *John_i saw a picture of him_i.
- b. John_i saw those pictures of him_i.

I feel that the contrast is weak (I'm inclined to feel that both are OK); but if there is a contrast, the strong/weak split falls along the same lines:

- (ii) a. ?John_i saw many pictures of him_i.
- b. ?John_i saw three pictures of him_i.
- c. John_i saw every picture of him_i.
- d. John_i saw each picture of him_i.
- 5. The idea that in nominal constructions there is a higher level of structure (the DP) that takes NP as its complement is due to Brame (1981). This idea is also utilized by Hellan (1986) and is developed most thoroughly by Abney (1987). The DP Hypothesis is also utilized to distinguish strong and weak NPs by Hudson (1989), De Hoop (1990), and Zwarts (1990). Additionally, Stowell (1989) distinguishes between DPs and NPs as referential (DP) and nonreferential (NP). The idea of distinguishing two determiner positions for strong and weak determiners actually predates the DP Hypothesis. Jackendoff (1977) distinguishes the two classes of determiners in terms of being attached to the NP at different bar levels, and this idea is also taken up by Rothstein (1988).
- 6. The idea that quantifiers might be grouped into categorially distinct classes is not new. The issue is discussed in Jespersen 1927. More recent discussion can be found in Selkirk 1970, 1977 and Jackendoff 1968, 1977. Carlson (1978) gives a historical account that shows that the quantifiers in Old English all functioned as adjectives, and that the strong quantifiers have since undergone a category change.
- 7. The determiner interpretation of weak quantifiers would have to be forced in the case of partitives, since as I noted in chapter 3, this is one case where the presuppositional reading of weak determiners is obligatory:

 - (i) a. *?Who did you see many of the pictures of?
 - b. *?Who did you read three of the books about?
 - c. *?Who did you paint several of the pictures of?

Bowers does not discuss the structure of partitives (see Selkirk 1970 and 1977 for some discussion, as well as Jackendoff 1977), and it is conceivable that the facts in (i) could be accommodated by his analysis in some way.

- 8. An empirical point that might be used to support a categorial ambiguity for weak determiners like *many* is the fact that in German *viel* ('many') can show both weak and strong inflection (e.g., *viel Wein* vs. *vieler Wein*). See Olsen 1989 for an analysis of strong and weak adjective inflection in German in the context of the DP Hypothesis.
- 9. Horn gives three arguments for his Structural Ambiguity Hypothesis (SAH). The first involves passive formation. In the case of *write*, a sentence with a “picture” NP object actually has two passives:

 - (i) a. Oscar wrote a book about manatees.
 - b. A book about manatees was written by Oscar.
 - c. A book was written about manatees by Oscar.

In (ib) the entire NP *a book about manatees* has been fronted. In (ic) only the NP portion *a book* has moved. Assuming that (i) is structurally ambiguous, parallel to (17), the passive in (ib) can be derived from the PP-within-NP structure in (17b),