TOPICS IN ELLIPSIS

A Dissertation Presented

by

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ABSTRACT

TOPICS IN ELLIPSIS

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The term ellipsis, broadly construed, applies to syntactic structures that seem to host obligatory positions not filled with overt lexical material. More narrowly construed, the term refers to a hypothetical grammatical process that deprives lexical material of its phonetic content. This dissertation explores ellipsis in both the broader and the narrower sense of the term. The three questions it addresses, with respect to different constructions, are the following. First, does the syntactic structure host a relevant silent position to begin with, and hence is it a case of ellipsis even in the broad sense of the term? Second, assuming the presence of silent structure, how does this structure come to be silent? Specifically, does it involve a grammatical process of ellipsis in the narrow sense? Third, assuming a process of ellipsis is at work, what are the constraints on this process?

Chapter 1 lays out these issues in greater detail and gives an overview of the dissertation. Chapter 2 addresses the third question formulated above. Specifically, it examines the effects of ellipsis in what I call *reduced conditionals* in German, a construction not previously analyzed in the literature. It is argued that in these cases, the

ellipsis process has the effect of forcing an index on its target to be anaphoric. Chapter 3

and chapter 4 deal with the first question by arguing that certain coordinations previously

analyzed in terms of movement to the left of a coordinating particle are instead to be

analyzed in terms of silent positions to its right. Chapter 3 makes this point with respect

to disjunctions of the form *...either...or*, while chapter 4 analyzes certain asymmetric

coordinations in German. Chapter 5 addresses the second question stated above.

Specifically, it presents new evidence for the view that silent verb phrases in cases of so-

called VP-ellipsis are not in fact the result of a process of ellipsis, but rather are silent

proforms with the semantics of bound variables.

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CHAPTER 1

INTRODUCTION

It is a well-known characteristic of natural languages that the mapping from meaning to form is not one-to-one. In particular, a sentence meaning generally determines a large family of sentences that express it. If two given members of such a family are made up from the same set of lexical items, then linguists may hypothesize that they are related by a grammatical process. Specifically, if the two sentences merely differ in word order, like *John looked up the number* and *John looked the number up*, then they might be taken to be related by a some optional and semantically vacuous process of reordering or *movement*. And if they merely differ in length, like *John could leave before I could leave* and *John could leave before I could*, then they might be taken to be related by some optional and semantically vacuous process of reduction or *ellipsis*. It is processes of ellipsis and related issues that the present dissertation is concerned with. This introductory chapter provides a brief survey of relevant phenomena, lays out general research questions, and explains how these questions are addressed in the following chapters.

1.1 Ellipsis and Incomplete Sentences

Let me begin by clarifying further the notion of ellipsis as standardly construed and understood in the following. I have said that two semantically equivalent sentences that merely differ in length might be taken to be related by ellipsis. More accurately, ellipsis is generally taken to be a process which maps a "syntactically complete" sentence into a "syntactically incomplete" one.[1] This is illustrated by the minimal pair given in the

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[1] A text like (i) below is as acceptable as (1b). Accordingly, judging (1c) "in isolation" means judging the sentence without assuming prior discourse. The same comment applies to the other cases of incomplete sentences presented below.

preceding paragraph, repeated in (1a,b) below. (1b) differs from (1a) merely in that the adverbial clause lacks an overt verb phrase. (1c) indicates that this clause is incomplete in that it is judged uninterpretable or ungrammatical in isolation.

(1)   a.   John could leave before I could leave.

       b.   John could leave before I could.

       c.   #I could.

Missing verb phrases are perhaps the best known phenomenon credited to a form of ellipsis. Some other well-known phenomena that have been analyzed in terms of ellipsis are illustrated by the triples in (2) to (4) below, which are parallel to (1). In each case, (a) and (b) are semantically equivalent, (b) is a substring of (a), and (c) shows that the reduced clause in (b) is unacceptable in isolation ((3b) from Sag 1976, (4b) from Ross 1969).[2]

(2)   a.   John ate rice and Mary ate beans.

       b.   John ate rice and Mary beans.

       c.   #Mary beans.

(3)   a.   Mary hasn't dated Bill, but she has dated Harry.

       b.   Mary hasn't dated Bill, but she has Harry.

       c.   #She has Harry.

   (i) You couldn't leave. I could.

   [2] Sentence (3c) is clearly acceptable if *has* is parsed a main verb, but this parse is irrelevant in the present context.

(4) a. He is writing something, but you can't imagine what he is writing.

  b. He is writing something, but you can't imagine what.

  c. #You can't imagine what.

In (2b), ellipsis appears to have targeted a finite verb, leaving behind as *remnants* a subject and an object noun phrase. In (3b), ellipsis seems to have applied to a participle, leaving behind as remnants a subject, an object and a finite auxiliary verb. In (4b), the apparent ellipsis target is an entire clause, with a bare *wh*-phrase being left behind as a remnant. These kinds of ellipsis are known in the literature as *Gapping*, *Pseudogapping*, and *Sluicing*, respectively.[3]

Before addressing substantive questions about ellipsis, it will be useful to adopt a particular framework for concreteness. I will follow Chomsky (1977) in the assumption that any D-structure representation of a sentence is mapped into an S-structure representation through movement, and that any S-structure representation is in turn mapped into a Phonological Form (PF) and a Logical Form (LF). As the terminology suggests, the Phonological Form and the Logical Form of sentence are taken to feed into its phonetic realization and its semantic interpretation, respectively.

This framework provides a natural way of thinking about minimal pairs like those formed by (a) and (b) in each of the triples above. Ellipsis might be taken to remove phonological information of linguistic material in the mapping from S-structure to Phonological Form, thereby ensuring that this material will not be pronounced. Elided material is then "missing" only in a phonological and phonetic sense. Ellipsis does not affect the Logical Form of a sentence to which it applies, and hence will not affect its

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[3] The term 'Gapping' originates in Ross (1970), 'Pseudogapping' in Levin (1979), and 'Sluicing' in Ross (1969). A recent reference on Pseudogapping is Lasnik (1995). Recent references on Sluicing are Chung, Ladusaw, and McCloskey (1995) and Romero (1998). Gapping is discussed in chapters 3 and 4, and verb phrase ellipsis in chapter 5.

semantic interpretation. Notice also that, in this view, the statement that ellipsis relates two given sentences is to be interpreted as the statement that the two sentences have identical Logical Forms, and only differ in that ellipsis has applied in the mapping to Phonological Form in one case, but not the other.[4]

Turning to empirical issues, a first question that comes to mind is under what conditions ellipsis can apply. That ellipsis is indeed subject to certain conditions is indicated by the deviance of the (c) cases in (1) to (4) above. and also by the perceived interpretation of the (b) examples. In each case, not only is the proposition expressed by (a) a possible meaning for (b), but it in fact seems to be the only possible meaning. If ellipsis could apply freely, the (c) cases should be acceptable and the (b) cases should have a range of possible interpretations. For example, it would be expected that ellipsis can relate (1b) to (5) below by targeting *dance*.

(5)   John could leave before I could dance.

It is standardly concluded from such observations that ellipsis of some target expression α must be licensed by the presence of an antecedent, that is, an "identical" occurrence of α somewhere in the linguistic vicinity of the target. Such a condition has the desired effect that the ellipsis targets in the (b) cases of (1) to (4) must be *leave*, *ate*, *dated*, and *he is writing*, respectively. It is also expected that the (c) cases are deviant in isolation.

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[4] In the view of ellipsis sketched here, two sentences related by ellipsis also have a common S-structure. In the analysis of silent verb phrases, Williams (1977) suggests that ellipsis sites are without content at S-structure, and are filled in the mapping to Logical Form. In this view, sentences related by ellipsis differ at S-structure, but still are identical at Logical Form. For the purposes of this dissertation, Williams's view is a notational variant of the one given in the text, and is actually adopted in chapter 2 for convenience. See Rooth (1981) for potential empirical differences between the two views of ellipsis.

A further question is how identity between an ellipsis target and its antecedent is to be construed, the main options being semantic identity and syntactic identity. The examples in (1) to (4) do not seem to point to any particular construal, given that the assumed ellipsis targets and their antecedents seem both syntactically and semantically identical. But more sophisticated data have been discussed in the literature, leading to specific proposals (Sag 1976, Williams 1977, Sag and Hankamer 1984, Fiengo and May 1994, Heim 1997).

The nature of the identity condition has in fact been one of the main topics in the literature on ellipsis. However, with regard to verb phrase ellipsis, the very assumption that the theory of ellipsis contains such a condition has been questioned. It has been suggested that at least in part, the supposed identity condition on ellipsis is actually a special cases of a more general condition on intonation (see Tancredi 1992, Rooth 1992b, Chomsky and Lasnik 1993, Klein 1993, Fox 1998). Let us ask again why, in the absence of prior dicsourse, *leave* appears to be the only possible ellipsis target in (1b) and why the sentence does not share a Logical Form with, say, (5) above. If ellipsis is subject to an identity condition, the answer is that *dance* in (5) does not have an ellipsis antecedent. Another possible answer, however, is suggested by the observation that in a natural pronunciation of (5), the final verb phrase *dance* in (5) is accented. Since *dance* in (5) expresses new information, this observation is in accordance with the familiar slogan that material expressing new information is accented. If unaccented material, and hence silent material in particular, cannot express new information, it follows that (1b) cannot have the reading expressed by (5). More generally, it might be speculated that conditions on the interpretation of unaccented material, motivated independently of ellipsis, at least in part account for restrictions on the interpretation of elided material.

The theory of ellipsis must thus answer the question what the identity conditions on ellipsis are, and whether these conditions are to be stipulated or whether they can be

derived as consequences of more general conditions on intonation (possibly in combination with other general semantic or pragmatic principles).

The theory of ellipsis also presupposes a more general theory of silent positions. Such a theory is needed because syntactic theory usually postulates an inventory of silent linguistic objects whose lack of phonetic content is a lexical property, rather than the result of a grammatical process. In particular, missing subjects and objects in languages like Japanese and Portuguese are standardly analyzed as silent pronouns. Extending this view, it might be postulated that at least in some cases, silent positions are filled by silent proforms of suitable syntactic categories, rather than by elided material. Specifically, the silent material in the (b) cases in of (1) to (4) might be taken to be silent proforms of the categories verb phrase, verb, and sentence. For the case of silent verb phrases, this analysis has in fact been discussed in the literature (see Rooth 1981, Partee and Bach 1984, Chao 1987, Klein 1987, Hardt 1993, Johnson 1996a), and receives some motivation from the observation that English has overt verb phrase proforms like *do it* and *do so*. Since sentence (6) below is semantically equivalent to (1a), the well-formedness and interpretation of (1b) falls out straightforwardly from the hypothesis that the English lexicon contains a silent variant of *do so*.

(6)   John could leave before I could do so.

The theory of ellipsis thus presupposes a theory of silent positions which determines whether an incomplete sentence hosts elided material or some other member of the inventory of silent expressions.

The theory of silent positions, in turn, presupposes a theory which identifies incomplete sentence. For there are cases which differ from (1) to (4) in that it is not evident whether they host silent positions to begin with. Perhaps the most prominent cases of this kind are coordinations. For example, it might be suggested that ellipsis, possibly an

instance of Gapping, relates the sentence in (7a) to the semantically equivalent (7b) by targeting the string *John bought*.[5]

(7) a. John bought a book and a newspaper.

   b. John bought a book and John bought a newspaper.

But this example differs from those in (1) to (4) in that it is not clear whether (7a) hosts a sentence that is incomplete in the relevant sense. If *a newspaper* is considered a sentence, then it is indeed an incomplete one, but it might also be considered a bare noun phrase which coordinates with *a book*. If coordination is taken to be cross-categorial, allowing in particular for coordination of noun phrases, then there in fact appears to be no reason to assume that the sentences in (7) are related through Gapping.

   However, there are similar examples which, in a non-ellipsis analysis, call for more than mere cross-categoriality of coordination. If *a newspaper* in (8a) below, from Munn (1993), is a bare noun phrase, then arguably *a book* is again the first coordinate. It follows that the word order in (8a) is derived, maybe from the equivalent (8b) through rightward movement of *and a newspaper* (see e.g. Hudson 1976, Munn 1993, Reinhart 1991, Zoerner 1995). It is not evident whether assuming this kind of movement is more or less

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[5] The fact that this string does not seem to form a constituent may seem in the way of an ellipsis analysis. However, there are cases more clearly involving incomplete sentences in which the ellipsis target fails to form a constituent or even a continuous string. A case in point is *Yesterday I took rice to school and today beans*, where ellipsis appears to have targeted *I took ... to school*. The question whether such cases can be reconciled with the assumption that grammatical processes only target constituents is suppressed in this dissertation. With regard to Gapping and Pseudogapping, relevant discussion can be found in e.g. Sag (1976), Pesetsky (1981), Jayaseelan (1990), Lasnik (1995), Johnson (1996a,b).

plausible than assuming that (8a) derives from the equivalent (8c) through Gapping of the strings *John bought* and *yesterday*.[6]

(8) a. John bought a book yesterday, and a newspaper.

b. John bought a book and a newspaper yesterday.

c. John bought a book yesterday, and John bought a newspaper yesterday.

Examples like (8a) have competing accounts because the material to the right of the coordinator can either be an ellipsis remnant, or a bare noun phrase that has moved rightward. Standard Gapping cases like (2b) above are different in that they more clearly exhibit an incomplete clause after the coordinator. Johnson (1996b) has nevertheless suggested that these cases, too, lend themselves to an analysis in terms of movement. The movement needed in this case, however, to the left rather than to the right, and the resulting parse represents a constituent structure that is perhaps unexpected. Specifically, (2b) is assigned the parse sketched in (9).

(9) John$_i$ ate$_j$ [[t$_i$ t$_j$ beans] and [Mary t$_j$ rice]]

In (9), the gap after the coordinator is not in fact an ellipsis site, but rather a trace left behind by leftward movement of the apparent ellipsis antecedent *ate*. This verb has moved across-the-board, that is, has extracted from both coordinates simultaneously (Ross 1967). Word order then indicates that, in addition, the first subject noun phrase

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[6] The question whether or not a given phrase is an incomplete sentence also arises in the analysis of so-called phrasal comparatives. For example, is *Bill* in *John bought bigger apples than Bill* a bare noun phrase or an incomplete sentence? Heim (1985) examines a number of potential arguments, but without arriving at a definite answer. See Kennedy (1997) and Lechner (1998) for recent discussion of and references on ellipsis in comparatives.

asymmetrically has moved out of the first coordinate to a sentence initial position. This analysis thus denies that the material preceding the coordinator is the first coordinate, and in fact denies that it forms a constituent. The first subject noun phrases and the finite verb are taken to asymmetrically c-command the material to their right, an assumption which Johnson motivates with observations on operator scope.

Notice that this analysis illustrates another way in which a special process of ellipsis might be dispensed with even in cases in which the presence of a silent position is acknowledged. We have seen above that seemingly elided verb phrases might be reanalyzed as silent proforms. Similarly, in (9), a verb that appears to have elided is reanalyzed as a trace, another well-established member of the inventory of silent linguistic objects. The analysis is attractive in that it makes efficient use of this inventory. On the other hand, it remains to be seen whether an independently established theory of movement supports extractions of the kind assumed in parses like (9).

In summary, a theory of incomplete sentences and ellipsis must answer at least the following three questions. First, what is the distribution of incomplete sentences, specifically, how can incomplete clauses be distinguished from bare phrases of other categories? For example, is *a newspaper* in (7a) an incomplete sentence or a bare noun phrase? Second, assuming that certain material is to be parsed as an incomplete sentence, what is the nature of the silent material? For example, are missing verb phrases due to ellipsis or are they silent proforms? Is the missing verb in Gapping cases like (2b) due to ellipsis or a trace due to movement? Third, assuming that there are indeed cases calling for an analysis in terms of a grammatical process of ellipsis, what are the conditions on the application of this process, and how do these conditions on ellipsis relate to conditions on intonation?

1.2 <u>Overview of the Dissertation</u>

The following chapters address the questions formulated in the last paragraph through close examination of particular phenomena, in each case exploiting observations not previously discussed. Addressing the second question, chapter 5 argues that certain silent verb phrases do not arise through ellipsis under identity, but rather are silent proforms with the semantics of bound variables. Addressing the first question, chapter 4 argues that certain coordinations in German that previously have been analyzed in terms of leftward movement from a first coordinate instead involve Gapping in the second coordinate. Chapter 3 makes a similar argument with respect to disjunctions of the form *...either... or ...* in English, defending the traditional view that *either* marks the left edge of its disjunction. Chapter 2 analyzes German conditionals with syntactically reduced consequent clauses, a construction not previously studied in the literature. Addressing the third question, a number of semantic peculiarities of these cases are derived from the assumption that ellipsis forces an event variable in the consequent to be anaphoric. The remainder of this introduction describes the content of the individual chapters in some more detail.

Chapter 5 deals with the analysis of silent verb phrases. It challenges the assumption that all silent verb phrases are due to a process of ellipsis, and argues that in certain cases, a silent verb phrase is a proform with the semantics of a bound variable. Neither the assumption that silent verb phrases can be proforms, nor the assumption that these proforms have the semantic of bound variables is original. However, the evidence presented in favor of this view is new. The main argument is based on complex examples like (10).

(10) When I had to cook, I didn't want to, and

when I had to clean, I didn't, either.

The second coordinate of this sentence can be understood as saying that John did not want to clean when he had to clean, suggesting that ellipsis has targeted the verb phrase *want to clean*. The puzzle for this analysis is that *want to clean* does not seem to have an identical antecedent in the first coordinate. It is argued that this puzzle cannot be solved by adjusting the theory of ellipsis, but rather calls for the assumption that certain silent verb phrases can be bound variables. It is also argued that a previously unnoticed puzzle about the semantics of intonation disappears under this analysis. The chapter also addresses the third question, discussing the identity condition on verb phrase ellipsis and its relation to conditions on intonation.

Chapter 4 discusses German cases of the kind illustrated in (11) below. This example exhibits a coordination which is asymmetric in that the coordinator *und* does not connect two overt constituents of the same syntactic category. A non-finite verb phrase appears to the right of *und*, but only a bare participle *gegessen* appears to its left, which is separated from its object *die Suppe* by the subject and the finite auxiliary.

(11)   Die Suppe hat er gegessen und sich hingelegt.

       the soup has he eaten   and refl down-lain

       'He ate the soup and lay down.'

It has been taken for granted in previous literature that in such cases, the coordinates are verb phrases and that the initial phrase has asymmetrically extracted from the first coordinate (Heycock and Kroch 1994). It is shown here that such an analysis overgenerates in that it fails to predict that in asymmetric coordinations of this kind, the string preceding the coordinator must form a complete sentence in isolation. It is argued here that this generalization is a consequence of the Coordinate Structure Constraint, which bans asymmetric extraction (Ross 1967). In the spirit of Wilder (1994), it is concluded that asymmetric coordinations of this kind are sentence coordinations in which

Gapping has reduced the second coordinate. Further consequences of this conclusion for the analysis of coordinations in German are discussed.

Like chapter 4, chapter 3 argues that a class of cases previously analyzed in terms of leftward movement instead calls for an analysis in terms of ellipsis. This class of cases is exemplified by (12) below, where a complete sentence appears between *either* and *or*, but only a bare noun phrase follows *or*.

(12)   Either John ate rice or beans.

Such 'unbalanced' disjunctions are puzzling under the traditional view that *either* functions like a bracket in marking the left edge of a disjunction (Quine 1967), for it appears that this view leads to the questionable conclusion that a sentence can coordinate with a noun phrase. It has therefore been assumed that as a result of movement, *either* can be distant from its disjunction at S-structure, so that (12) has the parse *either$_i$ John ate [t$_i$ rice or beans]*, where *or* coordinates noun phrases (Larson 1985). I argue instead that unbalanced disjunctions are coordinations of larger constituents with the second coordinate reduced by Gapping, relating (12) to the symmetric sentence coordination *Either John ate rice or John ate beans*. This argument addresses not only the first question raised in the end of the previous section, but the second question as well. If *either* always marks the left edge of its disjunction then the subject noun phrase in the gapping case *Either John ate rice or Mary beans* is inside the first coordinate. This suggests that not all Gaps can be analyzed as traces in the way sketched in (9) above, where the subject has extracted from the first coordinate.

Chapter 2 deals with what I call *reduced conditionals*, a construction in German which, although mentioned in Klein (1993), has not been analyzed previously. Reduced conditionals have consequents that appear to be incomplete clauses, lacking the finite

verb and possibly more material. In (13a) below, for example, the consequent consists of the bare prepositional phrase *mit dem Zug*.

(13) a. Wenn ich heim fahre, dann mit   dem Zug.
        if   I   home go   then with the train
        'If I go home, then it's by train.'

    b. Wenn ich heim fahre, dann fahre ich mit   dem Zug heim.
        if   I   home go   then go   I   with the train home
        'If I go home, then I go home by train.'

This sentence is perceived to be semantically equivalent to (13b), where the consequent has been completed by repeating material from the antecedent clause, suggesting that the two sentences are related through ellipsis. Interestingly, however, a reduced conditional is not in general semantically equivalent to its complete counterpart. There are cases in which the two differ in truth conditions, presuppositions, or grammaticality. Focusing on conditionals which are perceived to quantify over events, I derive these differences in a unified way from the stipulation that ellipsis forces an event variable in the consequent to be anaphoric. This analysis leaves a number of interesting questions for future research, in particular whether it extends to conditionals which are not perceived to quantify over events and whether the stipulated effect of ellipsis on event variables can be derived as an instance of a general principle.

CHAPTER 2

ELLIPSIS IN GERMAN CONDITIONALS[1]

2.1 <u>Introduction</u>

The consequent of a German conditional may be introduced by the adverb *dann* ('then'), in which case it typically forms a syntactically well-formed main clause on its own. This is illustrated in (1). As (1b) indicates, the consequent of the conditional in (1a) is an acceptable sentence on its own.

(1) a. Wenn die Maria den Hans besucht hat, dann hat sie den Karl angerufen.

         if   the Maria the Hans visited   has then has she the Karl called

         'If Maria visited Hans, then she called Karl.'

     b. Dann hat sie den Karl angerufen.

         then   has she the Karl called

         'Then she called Karl.'

The conditionals to be examined in this chapter are like (1a) in that they take the shape *wenn...dann...*, but they differ from (1a) in that their consequents fail to form grammatical main clauses on their own. The conditionals in (2a-c) are of this kind, as is indicated by the ungrammatical (3a-c).[2]

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[1] This chapter is based on Schwarz (1998a). I am indebted to all those mentioned there for helpful comments.

[2] The translation of (2a) only approximates the meaning of the German sentences. This will become clear below.

(2) a. Wenn einer wen besucht, dann der Hans den

      if   someone-Nom someone-Acc visits   then the-Nom Hans the-Acc

      Peter.

      Peter

      'If someone visits someone, then Hans visits Peter.'

   b. Wenn einer den Peter besucht, dann der Hans.

      if   someone-Nom the-Acc Peter visits   then the-Nom Hans

      'If someone visits Peter, then it's Hans.'

   c. Wenn der Hans wen besucht, dann den Peter.

      if   the-Nom Hans someone-Acc visits   then the-Acc Peter

      'If Hans visits someone, then it's Peter.'

(3) a. * Dann der Hans den Peter.

      then   the-Nom Hans the-Acc Peter

   b. * Dann der Hans.

      then   the-Nom Hans

   c. * Dann den Peter

      then   the-Acc Peter

While the strings in (3a-c) do not form grammatical main clauses, they may be considered fragments of main clauses which can be completed by adding suitable material to them. Apart from the initial adverb *dann*, (3c) hosts a noun phrase in the accusative, (3b) hosts a noun phrase in the nominative, and (3a) hosts both. Accordingly, grammatical sentences can be created by adding a transitive verb to (3a), a verb phrase to (3b), and a transitive verb together with a subject to (3c). One particular way of transforming the consequents in (2a-c) into complete main clauses consists in adding expressions to them that already

occur in their antecedents. In this way (2a-c) are mapped into (4a-c) below, where boldface typestyle indicates material shared between antecedents and consequents.

(4) a. Wenn einer   wen   **besucht**,   dann **besucht** der

if   someone-Nom someone-Acc visits   then visits   the-Nom

Hans den   Peter.

Hans the-Acc Peter

'If someone visits someone, then Hans visits Peter.'

   b. Wenn einer   **den   Peter besucht**, dann **besucht** der   Hans

if   someone-Nom the-Acc Peter visits   then visits   the-Nom Hans

den   Peter.

the-Acc Peter

'If someone visits Peter, then Hans visits Peter.'

   c. Wenn **der Hans**   wen   **besucht**,   dann **besucht der   Hans**

if   the-Nom Hans someone-Acc visits   then visits   the-Nom Hans

den   Peter.

the-Acc Peter

'If Hans visits someone, then Hans visits Peter.'

In the following, a consequent will be called *full* if it forms a complete main clause on its own, otherwise it will be called *reduced*. By extension, a conditional will be referred to as a *full conditional* if it contains a full consequent and as a *reduced conditional* if it contains a reduced consequent. Moreover, if a full conditional can be derived from a reduced conditional by repeating parts of the antecedent in the consequent, then the full conditional will be called the *full counterpart* of the reduced one.[3]

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[3] As noted by a reviewer for *Natural Language Semantics*, *dann* is obligatory in reduced conditionals even though it may be absent in full ones. For example, dropping

It seems that the only previous mention of reduced conditionals is in Klein (1993), who gives one example without attempting an analysis.[4] The aim of this chapter is to investigate the relationship between the semantics of reduced conditionals and the semantics of their full counterparts. Focusing on readings in which conditionals quantify over events, it will be shown that a reduced conditional and its full counterpart appear to be semantically equivalent in some cases, but show various semantic contrasts in others. It will be shown how these contrasts can be reduced to a difference in truth conditions if events are suitably construed. It will further be shown that this truth conditional difference can be derived under the assumption that reduced consequents are anaphoric in much the same way definite noun phrases can be anaphoric.

The presentation proceeds as follows. Section 2.2 compares the semantic properties of reduced conditionals and their full counterparts. In Section 2.3, a hypothesis is formulated as to how the truth conditions of reduced conditionals relate to the truth conditions of their full counterparts. It is shown that this hypothesis derives the

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dann is possible in the full conditional (4a), but leads to ungrammaticality in the reduced case in (2a). I do not have an explanation for this difference.

[4] Klein gives the example in (i) below, where the antecedent hosts the negation particle *nicht*. Klein reports that the consequent may or may not be understood to be negated. In my judgment, by contrast, the consequent of (i) must be understood negated, just as the consequent in the English translation given here.

(i) Wenn ich etwas   nicht lese, dann Thomas Mann.
    if   I   something not   read then Thomas Mann
    'If I don't read something, then it's Thomas Mann.'

However, Klein's example raises the general question whether in reduced conditionals, optional modifiers in the antecedent must be understood as modifying the consequent as well. I do not address this question below (but see Johnson 1996 and literature cited there for analogous issues in the analysis of Gapping). Also, I will not in the following discuss reduced conditionals hosting negation, as the semantic analysis of negation in conditionals introduces complications which I am not ready to address in this dissertation.

observations made in section 2.2. In section 2.4, the truth conditional contrast between reduced and full conditionals is derived from a contrast in Logical Form as construed in Heim (1982, ch.2).

2.2 <u>Some Contrasts between Reduced Conditionals and their Full Counterparts</u>

An observation due to Kratzer (1978) is that a conditional may often be interpreted as if its consequent contained either a modal auxiliary expressing necessity or a quantificational adverb with universal force, even if the consequent shows no such expression overtly. For example, the conditional in (1a) above, repeated in (5) below, may be understood like either (6a), which contains the epistemic modal *müssen* ('must'), or (6b), which contains the quantificational adverb *immer* ('always').

(5)   Wenn die Maria den Hans besucht hat, dann hat sie den Karl angerufen.
        if   the Maria the Hans visited   has then has she the Karl called
        'If Maria visited Hans, then she called Karl.'

(6) a.   Wenn die Maria den Hans besucht hat, dann muß sie den Karl angerufen
          if   the Maria the Hans visited   has then must she the Karl called
          haben.
          have
          'If Maria visited Hans, then she must have called Karl.'

     b.   Wenn die Maria den Hans besucht hat, dann hat sie immer den Karl
          if   the Maria the Hans visited   has then has she always the Karl
          called
          angerufen.
          'If Maria visited Hans, then she always called Karl.'

Kadmon (1987) terms the readings exemplified in (6a) and (6b) *one-case* interpretation and *multi-case* interpretation, respectively. In this chapter, the focus of attention is on multi-case interpretations of conditionals. This is made transparent in the following by considering conditionals whose consequents host *immer*, also called *multi-case conditionals* for short.

The stage has now been set to explore the semantic relationship between reduced conditionals and their full counterparts. It will be demonstrated that this relationship is interesting in that in some cases, a reduced conditional appears semantically equivalent to its full counterpart, whereas various differences emerge in other cases.

A case of the former kind is presented in (7). The reduced conditional in (7a) and its full counterpart in (7b) seem to be indistinguishable in semantic terms. They both appear to be false just in case I at least once go home without taking the train.

(7) a. Wenn ich heim fahre dann immer mit   dem Zug.

        if   I   home go   then always with the   train

        'If I go home, then it's always by train.'

    b. Wenn ich heim fahre, dann fahre ich immer mit   dem Zug heim.

        if   I   home go   then go   I   always with the   train home

        'If I go home, I always go home by train.'

There are three kinds of cases in which a reduced conditional differs semantically from its full counterpart. It is helpful to prepare the presentation of these cases with some additional terminology. First, except for *dann* and quantificational adverbs like *immer*, overt phrasal expressions in reduced consequents will be referred to as *remnant*s. For example, the remnants in (2a) above are *der Hans* and *den Peter*. Further, I take a remnant's *correlate* to be an expression in the antecedent that agrees with the remnant in

syntactic category and (if applicable) in case marking.[5] For example, the correlates of *der Hans* and *den Peter* in (2a) are *einer* and *wen*, respectively.

A first case in which a reduced conditional and its full counterpart differ semantically is now given in (8). The reduced conditional in (8a) differs from its full counterpart in (8b) in that the former is ungrammatical whereas the latter is fully acceptable.

(8) a. * Wenn ich den   Karl besuche, dann immer den   Peter.
         if   I   the-Acc Karl visit   then always the-Acc Peter

     b.   Wenn ich den   Karl besuche, dann besuche ich immer den   Peter.
         if   I   the-Acc Karl visit   then visit   I   always the-Acc Peter
         'If I visit Karl, then I always visit Peter.'

A first motivation for considering this contrast a semantic one comes from (9) below. The grammatical (9) and the ungrammatical (8a) are identical except for the correlates of *den Peter*: In (8a), it is the definite noun phrase *den Karl*, and in (9), it is the indefinite noun phrase *wen*.

(9)   Wenn ich wen   besuche, dann immer den   Peter.
         if   I   someone-Acc visit   then always the-Acc Peter
         'If I visit someone, then it's always Peter.'

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[5] The term 'correlate' seems to originate in Heim (1985), where it is used in a slightly different sense in the description of English comparatives.

As definite and indefinite noun phrases are distinguishable in semantic terms, it is at least conceivable that (8a) is ungrammatical for semantic reasons. In the following, the contrast in (8) will be referred to as the *definiteness effect*.

A second kind of semantic contrast between a reduced conditional and its full counterpart is illustrated in (10). The reduced conditional in (10a) and its full counterpart in (10b) are both grammatical. However, they differ in that the former, but not the latter, is pragmatically deviant.

(10) a. !! Wenn ich was   zum Lesen mitnehme, dann immer meine Brille.

        if   I   something to   read   along-take then always my   glasses

        'If I take something to read, then it's always my glasses.'

    b.   Wenn ich was   zum Lesen   mitnehme, dann nehme ich immer meine

        if   I   something to   read   along-take then take   I   always my

        Brille   mit.

        glasses along

        'If I take something to read, then I always take my glasses.'

The conditional in (10a) is perceived deviant as it carries a presupposition to the effect that my glasses are something to read (rather than something to read with). Thus, (10a) presupposes that the correlate *was zum Lesen* can truthfully be predicated of the remnant *meine Brille*. In the following, the contrast in (10) will be referred to as the *presupposition effect*.

A third kind of difference between a reduced conditional and its full counterpart is illustrated in (11) below, where (11a) repeats (9) above. The reduced conditional (11a) and its full counterpart (11b) are both grammatical and pragmatically well-formed, but they differ in truth conditions. (11a) is judged false if I visit someone other than Peter,

whereas (11b) may be true in such a scenario. In the following, the truth conditional

contrast in (11) will be referred to as the *exhaustiveness effect*.[6]

(11) a. Wenn ich wen   besuche, dann immer den   Peter.

         if   I   someone-Acc visit   then always the-Acc Peter

         'If I visit someone, then it's always Peter.'

    b. Wenn ich wen   besuche, dann besuche ich immer den   Peter.

         if   I   someone-Acc visit   then visit   I   always the-Acc Peter

         'If I visit someone, then I always visit Peter.'

The remainder of this chapter will be concerned with deriving the observations

reported in this section. In section 2.3, it is shown that they follow from particular

assumptions as to how the truth conditions of full and reduced multi-case conditionals

relate to each other. In section 2.4, this relation between truth conditions is derived from

assumptions about the Logical Form of multi-case conditionals.

2.3 A Contrast in Truth Conditions

    In this section, it is shown that the data in section 2.2 can be seen to follow from the

truth conditions of full and reduced multi-case conditionals. In section 2.3.1, the truth

conditions of full multi-case conditionals that intuitively quantify over events are

examined in detail. In section 2.3.2, a hypothesis is formulated as to how the truth

conditions of reduced multi-case conditionals relate to the truth conditions of their full

counterparts. Naturally, this hypothesis is argued to have the desired consequences.

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[6] Von Fintel (1994) discusses a similar effect in examples like *I always visit PETER*, where capitalization indicates prosodic prominence. The analysis of reduced conditionals presented below is partly inspired by this discussion.

2.3.1 On the Truth Conditions of Full Multi-Case Conditionals

Full multi-case conditionals are often interpreted as quantifying over events. In particular, the full conditionals discussed in section 2.2 are. For example, (7b) quantifies over events of me going home and (8b) quantifies over events of me visiting Karl. Extending Kadmon's (1987) terminology, I will refer to such cases as *multi-event* conditionals. The aim of this section is to examine the truth conditions of multi-event conditionals in detail.

To do so, it is helpful to establish some assumptions about the nature of events. I will follow Zucchi (1989) and Portner (1992), who construe events as situations in the sense of Kratzer (1989). Kratzer's (1989) framework, call it *situation semantics*, assigns situations a role that is in several ways analogous to the role of possible worlds in possible-worlds semantics. In possible-worlds semantics, worlds are basic objects, propositions are sets of possible worlds, and a proposition is taken to be true in a world just in case that world is an element of the proposition. Analogously, in situation semantics, situations are basic objects, propositions are sets of possible situations, and a proposition is taken to be true in a situation just in case that situation is an element of the proposition.

Situation semantics does not in fact do away with possible worlds. Rather, possible worlds are recovered as situations of a particular sort: They are most comprehensive situations. More precisely, it is assumed that the set of possible situations is partially ordered by a part-of relation and possible worlds are identified with those situations that are maximal with respect to this relation. (In fact, the part-of relation does not only relate situations to each other. It is also assumed that a situation may have individuals as parts, viz. those individuals that participate in it.) Any possible situation is assumed to be part of exactly one such maximal element. For example, any actual situation is part of the actual world and of no other world.

Zucchi (1989) and Portner (1992) now suggest that events, too, may be construed as situations with particular properties. Events are unlike possible worlds, though, in that they are defined relative to propositions. Let us say that for each proposition, there is a set of situations that are events *for* that proposition. According to Zucchi's and Portner's proposal, a situation e is an event for some proposition p just in case e is a minimal element of p, that is, just in case p is true in e and e has no proper part in which p is true as well.[7] This definition ensures that a situation that is an event for some proposition has no parts irrelevant to the truth of that proposition. For example, an event for the proposition that I visit Karl will have as parts no individuals other than Karl and me. This consequence of minimality will prove crucial in the arguments to be made below.[8]

Before I turn to the analysis of multi-event conditionals, let me establish some terminological conventions. Since the truth of a multi-event conditional intuitively depends on actual facts only, I will in the following not be concerned with non-actual situations. Moreover, I will only be concerned with the truth of conditionals in the actual world, not any smaller actual situations. For convenience, I will therefore use bare *true* synonymous with *true in the actual world*. Likewise for *truth*, *false*, etc. Also, I will use bare *situation* and *event* synonymous with *actual situation* and *actual event*, respectively. And I will use *proposition* synonymous with *set of actual situations*, and *proposition that* α as synonymous with *set of actual situations in which* α *is true*.

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[7] The proposal that multi-case conditionals quantify over minimal situations originates with Berman (1987). It is taken up in Heim (1990) as well as in von Fintel (1994, 1995).

[8] In fact, events presumably should not always be considered strictly minimal. For example, if John slept for an hour, then this should guarantee the existence of an event for the proposition that John slept. The event should last for an hour even though it will then not be strictly minimal. It will have parts that last for less than an hour in which John also sleeps. But such an event can still be considered minimal in the sense that it has no irrelevant parts. In Kratzer (1997), minimality in this weak sense is formally characterized. See also von Fintel (1995) for discussion.

Let us now turn to the analysis of multi-event conditionals by examining the conditional in (6b) above, repeated in (12) below. In the present terminology, (12) quantifies over events for the proposition that Maria visited Hans. In the following, the final proposal as to the truth conditions of (12) will be approached via two preliminary attempts.[9] The first attempt is presented in (13).

(12)   Wenn die Maria den Hans besucht hat, dann hat sie immer den Karl

         if   the Maria the Hans visited   has then has she always the Karl

         called

         angerufen.

         'If Maria visited Hans, then she always called Karl.'

(13) $\forall$e[e::{s: s is in the past & Maria visits Hans in s} $\rightarrow$ e::{s: s is in the past &

       Maria calls Karl in s}]

Here as in the following, the meta language variables s, e, and e' are assumed to range over (actual) situations. For any situation e and proposition p, e::p says that e is an event for p. According to (13), then, (12) is true just in case every event for the proposition that Maria visited Hans is also an event for the proposition that Maria called Karl. Notice that under the present construal of events, these truth conditions for (12) are too strong. For by virtue of being minimal, no event for the proposition that Maria visited Hans has Karl as its part and therefore no such event can be an event for the proposition that Maria called Karl. If (13) were assumed as the truth conditions of (12), it would falsely be predicted that (12) is false unless Maria in fact never visited Hans.

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[9] The following discussion is in part inspired by similar arguments made in von Fintel (1994) and Rothstein (1995).

A preliminary attempt to weaken (13) is presented in (14) below. (14) differs from (13) in that the meta language event variable in the consequent has been existentially bound. Notice that because of this, the wide scope universal quantifier does not bind a variable in the consequent and thus can be read as a narrow scope existential quantifier. By (14), then, (12) is false just in case there is an event for the proposition that Maria visited Hans and there is no event for the proposition that Maria called Karl.

(14)   ∀e[e::{s: s is in the past & Maria visits Hans in s} → ∃e'[e'::{s: s is in the past & Maria calls Karl in s}]]

These truth conditions are arguably too weak. For suppose that last week, Maria visited Peter exactly once and also called Karl exactly once. Further suppose that the visit was on Monday, whereas the call was on Friday. Let me call this scenario Σ. According to (14), (12) should be true in Σ, but in fact it is likely to be judged false. (12) is likely to be understood as saying that Maria always called Karl right before, during, or right after visiting Hans. Adopting terminology from Rothstein (1995), let me say that for each event for the proposition that Maria visited Hans, there must be a *matching* event for the proposition that Maria called Karl. In (15), (14) has been updated accordingly.

(15)   ∀e[e::{s: s is in the past & Maria visits Hans in s} → ∃e'[e' matches e & e'::{s: s is in the past & Maria calls Karl in s}]]

As is implicit in (15), the matching relation operative in the interpretation of a multi-event conditional is a relation between situations whose domain and range are the events for the propositions expressed by the consequent and the antecedent, respectively. Rothstein (1995) does not study the matching relations operative in multi-event conditionals, but rather in examples like *Maria called Karl every time she visited Hans*. However, the two

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kinds of sentences are so similar in the relevant respects that I can illustrate Rothstein's claims about matching relations with example (12).

To begin, Rothstein argues that the nature of the matching relation operative in a given sentence depends on the context in which the sentence is uttered. Such a context sensitivity can in fact be detected in the interpretation of (12). In the most ordinary utterance contexts, (12) is indeed judged false in the above scenario Σ. However, there nevertheless are contexts for (12) in which it may be true in Σ. For example, in the context sketched in (16), (12) may well be understood as saying that there is no week in which Maria visited Hans without calling Karl in the same week. In this reading, the truth of (12) is compatible with Σ. Thus, while in the most ordinary contexts, the matching relation operative in (12) is restricted as given in (17a), (16) creates a context in which it is (merely) restricted as given in (17b).

(16)   Herbert has been spying on Maria for months, following her every step. In reviewing his notes, Herbert finds some curious generalizations as to Maria's actions within each week. For example, the weeks in which Maria went to the gym happen to coincide with the weeks in which she rented a video tape.

(17) a.   s' matches s   only if   s' is right before, during, or right after s.
     b.   s' matches s   only if   s' is within the same week as s.

Furthermore, Rothstein argues that a matching relation operative in a given sentence in a given utterance context is always a function (from its domain to its range). This hypothesis - let us call it the *matching hypothesis* - is in fact motivated by the interpretation of (12): Intuitively, (12) can only be true if Maria called Karl at least as many times as she visited Hans. Rothstein calls this kind of phenomenon the *matching effect*. The matching effect in (12) follows from the matching hypothesis since by

definition, a function cannot map one and the same call into more than one visit. Notice that according to the matching hypothesis, the matching effect is a genuinely semantic phenomenon in the sense that it cannot be made disappear by manipulating the utterance context. This claim also appears compatible with the judgments on (12).

In the arguments to be made in the course of this chapter, I will further rely on the intuition that the matching condition always requires that two situations be sufficiently local to each other, where locality is to be understood in a temporal or perhaps spatio-temporal sense. I suggest that what varies with the utterance context is merely the degree of locality that is required.[10] Notice that this hypothesis is compatible with the above discussion of (12). Whereas in an ordinary utterance context, the interpretation of (12) rests on the strict notion of locality described in (17a), the (less ordinary) utterance context in (16) makes available the more liberal locality relation described in (17b).

Let me summarize this section with (18) below, which generalizes (15) to arbitrary multi-event conditionals. The reader familiar with Lewis (1975) will be aware that not all multi-case conditionals are interpreted as (just) quantifying over events. The final analysis will do justice to this, but first let us see that (18) can serve as the basis of a unified account of the data in section 2.2.

(18)   Suppose that α is a full multi-event conditional whose antecedent expresses the
       proposition p and whose consequent less the adverb *immer* expresses the
       proposition q. Then α has the following truth conditions:
       $\forall e[e::p \rightarrow \exists e'[e' \text{ matches } e \ \& \ e'::q]]$

---

[10] Here I depart from Rothstein (1995) who suggests that the matching relation may have contents other than spatio-temporal locality. I am not convinced that Rothstein's data enforce this assumption.

2.3.2 <u>The Truth Conditions of Reduced Multi-Event Conditionals</u>

In section 2.2 above, it has been shown that in some cases, a reduced multi-event conditional and its consequent seem semantically equivalent but that certain semantic contrasts appear in other cases. Three kinds of semantic contrasts have been presented: The definiteness effect, the presupposition effect, and the exhaustiveness effect. The exhaustiveness effect is a contrast in truth conditions, the presupposition effect is a contrast in presuppositions, and the definiteness effect is a contrast in grammaticality.

The aim of this section is to show that the observations reported in section 2.2 can be accounted for in a unified way by making suitable assumptions about how the truth conditions of reduced multi-event conditionals relate to the truth conditions of their full counterparts. The hypothesis to be explored in this section is stated in (19).

(19) For any propositions p and q, a reduced conditional has the truth conditions in (i) if its full counterpart has the truth conditions in (ii).

(i) $\forall e[e::p \rightarrow e::q]$

(ii) $\forall e[e::p \rightarrow \exists e'[e' \text{ matches } e \ \& \ e'::q]]$

According to (19), if for some event e and some proposition q, the truth of a reduced conditional's full counterpart requires that e be matched by some event for q, then the truth of the reduced conditional requires that e itself be an event for q. Let us study the consequences of this hypothesis by applying it to the relevant data.

Let us attend to the definiteness effect first. The reduced conditional in (20a) and its full counterpart in (20b) repeat (8a,b) above. The pertinent observation is that (20a) is ungrammatical whereas (20b) is grammatical. According to (18) above, the truth conditions of (20b) are the ones given in (21b). From this together with (19), it follows that the truth conditions of (20a) are the ones given in (21a).

(20) a. * Wenn ich den Karl besuche, dann immer den Peter.

   if   I   the-Acc Karl visit   then always the-Acc Peter

   b.   Wenn ich den Karl besuche, dann besuche ich immer den Peter.

   if   I   the-Acc Karl visit   then visit   I   always the-Acc Peter

   'If I visit Karl, then I always visit Peter.'

(21) a. $\forall e[e::\{s: I \text{ visit Karl in } s\} \rightarrow e::\{s: I \text{ visit Peter in } s\}]$

   b. $\forall e[e::\{s: I \text{ visit Karl in } s\} \rightarrow \exists e'[e' \text{ matches } e \ \& \ e'::\{s: I \text{ visit Peter in } s\}]]$

According to (21b), (20b) is true just in case every event for the proposition that I visit Karl is matched by some event for the proposition that I visit Peter. These truth conditions are intuitively appropriate. Notice that (20b) shows the matching effect and thus further motivates the matching hypothesis: Intuitively, the sentence cannot be true unless I visit Peter at least as many times as I visit Karl.

According to (21a), the reduced conditional in (20a) is true just in case every event for the proposition that I visit Karl is itself an event for the proposition that I visit Peter. Recall now from above that following Zucchi (1989) and Portner (1992), I take an event for a given proposition to be a minimal element of that proposition. It follows that an event for the proposition that I visit Karl contains no individual other than Karl and me. Since in particular, such an event cannot contain Peter, it cannot be an element of the proposition that I visit Peter and thus cannot be an event for it, either.

It then follows that (20a) is false if there is an event for the proposition that I visit Karl. On the other hand, as argued by de Swart (1993), a multi-event conditional is infelicitous unless there are at least two distinct events for the proposition expressed by the antecedent. For example, the full conditional in (20b) is arguably infelicitous if I visit Karl only once or do not visit him at all. Without additional assumptions, it is expected that the same holds true for (20a). It then follows that (20a) is false whenever it is

felicitous: The sentence thus presupposes that it is false. I propose that this is why (20a) is ungrammatical.

There is in fact independent evidence to the effect a sentence is ungrammatical if it presupposes that it is false. For example, (22b) below entails that no solutions exist and therefore, (22a) presumably does, too. But by virtue of hosting the definite noun phrase *the solutions*, (22a) is infelicitous unless at least two solutions exist. If this is why (22a) is ungrammatical, (20a) is predicted to be ungrammatical as well.[11]

(22) a. * There are none of the solutions.

 b. There are no solutions.

Let us now turn to the presupposition effect. The reduced conditional in (23a) and its full counterpart in (23b) repeat (10a,b) above. The pertinent observation is that (23a), but not (23b), intuitively presupposes that my glasses are something to read. It follows from (18) above that (23b) has the truth conditions in (24b) and from this together with (19), it follows that (23a) has the truth conditions in (24a).

(23) a. !! Wenn ich was   zum Lesen mitnehme, dann immer meine Brille.

 if   I   something to   read   along-take then always my   glasses

 'If I take something to read, then it's always my glasses.'

---

[11] As noted by a reviewer for *Natural Language Semantics*, (8a) becomes grammatical when the particle *auch* ('also') is added after *immer*. This fact does not follow from the present analysis of reduced conditionals. I leave it as a topic for future research.

b.   Wenn ich was   zum Lesen   mitnehme, dann nehme ich immer meine

     if   I   something to   read   along-take then take   I   always my

     Brille   mit.

     glasses along

     'If I take something to read, then I always take my glasses.'

(24) a. $\forall$e[e::{s: I take something to read in s} $\rightarrow$ e::{s: I take my glasses in s}]

     b. $\forall$e[e::{s: I take something to read in s} $\rightarrow$ $\exists$e'[e' matches e & e'::{s: I take my glasses in s}]]

According to (24b), (23b) is true just in case every event for the proposition that I take something to read is matched by some event for the proposition that I take my glasses. These truth conditions are intuitively appropriate. Notice that the matching effect is again detectable, further motivating the matching hypothesis: For (23b) to be true, I intuitively must take my glasses as many times as I take something to read.

According to (24a), (23a) is true just in case every event for the proposition that I take something to read is itself an event for the proposition that I take my glasses. Notice that under the assumption that my glasses are not something to read, (24a) is predicted to be ungrammatical for the same reasons that (20a) is ungrammatical according to the above analysis.

For suppose that my glasses are not something to read. Then, since events are minimal, an event for the proposition that I take something to read cannot contain my glasses and therefore cannot be an event for the proposition that I take my glasses. It then follows that like (20a), (23a) presupposes that it is false. This resulting ungrammaticality

can only be avoided by giving up the assumption that my glasses are not something to read. The presupposition effect then follows.[12]

Let us now attend to the exhaustiveness effect. The reduced conditional in (25a) and its full counterpart in (25b) repeat (11a,b) above. The pertinent observation is that (25a) is false if I visit someone other than Peter, whereas (25b) may be true in that case. According to (18) above, (25b) has the truth-conditions in (26b). From this together with (19), it follows that (25a) has the truth conditions given in (26a).

(25) a. Wenn ich wen   besuche, dann immer den   Peter.

        if   I   someone-Acc visit   then always the-Acc Peter

        'If I visit someone, then it's always Peter.'

      b. Wenn ich wen   besuche, dann besuche ich immer den   Peter.

        if   I   someone-Acc visit   then visit   I   always the-Acc Peter

        'If I visit someone, then I always visit Peter.'

(26) a. $\forall$e[e::{s: I visit someone in s} $\rightarrow$ e::{s: I visit Peter in s}]

      b. $\forall$e[e::{s: I visit someone in s} $\rightarrow$ $\exists$e'[e' matches e & e'::{s: I visit Peter in s}]]

According to (26b), the full conditional in (25b) is true just in case every event for the proposition that I visit someone is matched by some event for the proposition that I visit Peter. The relevant question is whether (26b) can be true if I visit someone other than Peter. Interestingly, assuming that the matching hypothesis is correct, the answer is *no*.

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[12] This analysis of the presupposition effect raises the question why the ungrammatical (20a) above cannot be salvaged by the assumption that Karl and Peter are identical. Here it becomes relevant that remnants like *den Peter* in (20a) always carry focal intonation. If *den Peter* is pronounced with such an intonation in (20b), Peter and Karl cannot be considered the same person. Accordingly, if in (20b), *den Peter* is replaced by *den Karl*, the result is ungrammatical under the relevant intonation.

For by the matching hypothesis, (26b) cannot be true unless there at least as many events for the proposition that I visit Peter as there are events for the proposition that I visit someone. Now suppose that at least once, I visit some person distinct from Peter. Suppose further that I visit Peter n times. Then there are altogether at least n+1 events for the proposition that I visit someone. Thus there are less events for the proposition that I visit Peter than there are events for the proposition that I visit someone.

A possible conclusion from this is that the matching hypothesis is too strong and that there are at least some utterance contexts for (25b) in which the matching relation operative in the interpretation of this sentence is not a function. However, this conclusion leaves it open why the matching effect is attested in the full multi-event conditionals above. Notice in particular that the matching effect is present in (20b) which differs from (25b) only minimally.

Moreover, even under the assumption that the matching hypothesis is correct, it is in fact expected that (25b) can be true if I visit someone other than Peter. For, it is known that the descriptive content of a noun phrase may often be understood as more specific than is warranted by overt lexical material in that noun phrase. For example, *everyone laughed when Peter sneezed* may be understood as saying that everyone but Peter laughed when Peter sneezed. In a similar way, *if I visit someone, then Peter always goes out* may be understood as saying that Peter always goes out if I visit someone other than Peter. It is therefore expected that the descriptive content of the indefinite *wer* in (25b) may be understood as excluding Peter. In that case, the antecedent expresses the proposition that I visit someone other than Peter and the resulting truth conditions for (25b) are the ones stated in (27).

(27) $\forall e[e :: \{s: \text{I visit someone other than Peter in } s\} \rightarrow \exists e'[e' \text{ matches } e \& e' :: \{s: \text{I visit Peter in } s\}]]$

Unlike (26b), (27) may be true if I visit someone other than Peter. The matching hypothesis merely predicts that (25b) is false if I visit Peter less often than I visit someone other than Peter. This prediction is in fact borne out. I conclude that the judgments on (25b) do not prove the matching hypothesis false.

Let us now turn to the reduced conditional in (25a). According to (26a), (25a) is true just in case every event for the proposition that I visit someone is also an event for the proposition that I visit Peter. This correctly predicts that (25a) is false if I visit some person distinct from Peter. For if I did, there would be an event for the proposition that I visit that person. Since that event is minimal, it cannot have Peter as a part and therefore cannot be an event for the proposition that I visit Peter. Then (26a) is false.

Notice that the possibility of interpreting the descriptive content of *wer* as excluding Peter does not affect the interpretation of (25a) in the same way it affects the interpretation of (25b). For, if the antecedent of (25a) expressed the proposition that I visited someone other than Peter, then (25b) would be ungrammatical for the same reasons as (20a) above: Since no event for the proposition that I visit someone other than Peter can itself be an event for the proposition that I visit Peter, (25a) would presuppose that it is false.

To conclude this section, let us attend to the reduced conditional in (28a) and its full counterpart in (28b) which repeat (7a,b) above. The pertinent observation about this pair of sentence is that they seem to be indistinguishable in terms of truth conditions. They both appear to be false just in case I at least once go home without taking the train. In the present analysis, it is predicted that (28a) has this interpretation but it is not predicted that (28b) does as well. Let us see why.

First, (18) and (19) above assign (28a) and (28b) the truth conditions given in (29a) and (29b), respectively.

(28) a. Wenn ich heim fahre dann immer mit   dem Zug.

         if   I   home go   then always with the   train

         'If I go home, then it's always by train.'

      b. Wenn ich heim fahre, dann fahre ich immer mit   dem Zug heim.

         if   I   home go   then go   I   always with the   train home

         'If I go home, I always go home by train.'

(29) a. ∀e[e::{s: I go home in s} → e::{s: I go home by train in s}]

      b. ∀e[e::{s: I go home in s} → ∃e'[e' matches e & e'::{s: I go home by train in

         s}]]

According to (29a), the reduced conditional in (28a) is true just in case every event for the proposition that I go home is also an event for the proposition that I go home by train. It follows by reasoning familiar from above that (29a) is false if I ever go home by a mode of transportation other than the train.

    According to (29b), the full conditional in (28b) is true just in case every event for the proposition that I go home is matched by some event for the proposition that I go home by train. It again follows by familiar reasoning that under the matching hypothesis, (29b) is false if I go home by a mode of transportation other than the train.

    Thus, if (29a) and (29b) were the only possible interpretations of (28a) and (28b), respectively, then the two sentences would be correctly predicted to be equivalent. However, in analogy to (25b) above, it might be expected that the antecedent of (28b) can be taken to express the proposition that I go home by a mode of transportation other than the train. In that case, (18) would assign to (28b) the truth conditions in (30). (30) may be true even if I do not always take the train to go home. The question is why (30) is not an available interpretation of (28a).

(30) $\forall$e[e::{s: I go home in s by a mode of transportation other than the train} $\rightarrow$

$\exists$e'[e' matches e & e'::{s: I go home by train in s}]]

There at least two possible answers. First, it might be that the antecedent of (28b) cannot be taken to express the proposition that I go home by a mode of transportation other than the train. This might be related to the fact no overt lexical material in the antecedent refers to a mode of transportation.

Alternatively, it might be that the matching relation cannot be taken to relate two distinct events of me going home. This might be blamed on the fact that it is hard to think of two different trips to a particular place as temporally contiguous. In particular, if I am at home, then it is hard to look at my leaving home as another going home. If this is so, then (28b) in the interpretation (30) is ungrammatical for the same reason that (20a) is ungrammatical in the interpretation (21a): The sentence is false whenever it is felicitous.

For the purposes of this chapter, it does not matter whether the reason for the intuitive equivalence of (28b) with (28a) is one of the two mentioned. It only matters that the reason is compatible with the truth conditions for multi-event conditionals specified in (18) and (19). In the following, I will assume that it is.

2.4 A Contrast in Definiteness

In this final section, the truth conditions of multi-event conditionals will be derived by extending Heim's (1982, ch.2) theory of quantification over individuals in multi-case conditionals. Section 2.4.1 introduces Heim's analysis of definiteness and multi-case conditionals. Section 2.4.2 extends it to account for (18) above. Section 2.4.3 derives (19) from a stipulation as to how the Logical Form of a reduced multi-event conditional relates to the Logical Form of its full counterpart. Finally, section 2.4.4 argues that the relation stipulated in section 2.4.3 can be seen to arise from a contrast in definiteness.

2.4.1 <u>Heim's Theory of Definiteness</u>

One of the aims of Heim's theory of definiteness is to account for conditionals whose consequent hosts a pronoun or definite noun phrase that is anaphoric to an indefinite in the antecedent. For example, in the multi-case conditional in (31a) below, the antecedent contains the indefinite noun phrase *ein Mann* ('a man') and the consequent contains the definite noun phrase *der Mann* ('the man') which may be understood as anaphoric to the indefinite. In this anaphoric reading, (31a) entails that every man who comes in buys a book. In Heim's theory, (31a) has this reading by virtue of being associated with the Logical Form (LF) in (31b), where object language variables are underlined.

(31) a. Wenn ein Mann reinkommt, dann kauft der Mann immer ein Buch.

    if   a   man in-comes   then buys the man always a   book

    'If a man comes in, then the man always buys a book.'

  b. immer x̲   [wenn [$_S$ [ein Mann]$_x$ [$_S$ x̲ reinkommt]]]   ∃y̲[dann [$_S$ [der Mann]$_x$ [$_S$ [ein Buch]$_y$ [$_S$ x̲ y̲ kauft]]]]

The LF in (31b) is a so-called *tripartite structure*, consisting of a the quantificational adverb *immer*, followed by the *restrictive clause*, followed by the *nuclear scope*. The nuclear scope is prefixed with an existential quantifier, called *existential closure*. The restrictive clause is the LF representation of the antecedent and the nuclear scope is the LF representation of the consequent less the quantificational adverb. These LF representations are derived from surface structure by indexing any definite and indefinite

noun phrase with a variable and adjoining it to S.[13] The rule of *quantifier indexing* copies the index of any indefinite noun phrase onto the closest quantifier c-commanding it. Thus, if an indefinite is inside the restrictive clause, its index will be copied onto the initial quantifier and if an indefinite is inside the nuclear scope, its index will be copied onto existential closure. Indices on definite noun phrases do not undergo quantifier indexing. In this way, (31b) is derived from (31a).[14]

Heim assumes that an indexed noun phrase is an open formula that expresses a truth value with respect to a given variable assignment. For example, with respect to any variable assignment g, the formulas *[ein Mann]$_x$* and *[der Mann]$_x$* are both true just in case g(x) is a man. If a formula is adjoined to another, then the result is interpreted as a conjunction of truth values. The adverbs *wenn* ('if') and *dann* ('then') are taken to be semantically vacuous. Thus, with respect to any assignment g, the restrictive clause of (31b) is true just in case g($\underline{x}$) is a man who comes in. Similarly, the nuclear scope without the existential closure is true just in case g($\underline{x}$) is a man and g($\underline{y}$) is a book and g($\underline{x}$) buys g($\underline{y}$). In order to determine the truth value of (31b) as a whole, it remains to be specified what the interpretations of *immer* and existential closure are. This is done in (32) below. There, $|.|^g$ is the function that maps any formula into its truth value with respect to the variable assignment g. $i_1,...,i_n$ range over LF variables and $h<i_1,...,i_n>g$ indicates that h and g assign the same values to all variables except possibly for $i_1,...,i_n$.

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[13] Quantificational noun phrases are also indexed and moved but will be disregarded in this study. As for names, I will depart from Heim (1982) - and follow Kratzer (1995) - by assuming that they are not indexed and thus stay in situ.

[14] In (31b) and in the following, it is assumed that at LF, the verb of the consequent occupies its base position at the end of the clause, even though at the surface, it immediately follows *dann*. Nothing hinges on this assumption, though.

(32) For any $i_1,...i_n$, g, and $n \geq 0$

(i) $|\exists i_1,...,i_n \alpha|^g = 1$ iff $\exists h[h < i_1,...,i_n > g \ \& \ |\alpha|^h = 1]$

(ii) $|immer \ i_1,...,i_n \alpha \beta|^g = 1$ iff $\forall h[h < i_1,...,i_n > g \ \& \ |\alpha|^h = 1 \rightarrow |\beta|^h = 1]$

It is presupposed in (32) that *immer* and existential closure need not be followed by exactly one variable as in (31b), but possibly by more than one variable or none at all. Cases of that sort will come up below. For now, notice that application of (32a,b) leads to (33a) as the truth conditions of (31b) with respect to assignment g. (33a) is equivalent to (33b) which as desired, entails that every man who comes in buys a book.

(33) a. $\forall h[h < \underline{x} > g \ \& \ h(\underline{x})$ is a man $\& \ h(\underline{x})$ comes in $\rightarrow \exists k[k < \underline{y} > h \ \& \ k(\underline{y})$ is a book $\&$

$k(\underline{x})$ buys $k(\underline{y})]$

b. $\forall x[x$ is a man $\& \ x$ comes in $\rightarrow \exists y[x$ is a man $\& \ y$ is a book $\& \ x$ buys $y]]$

Heim's theory also predicts that the interpretation of (31a) is not preserved if the definite noun phrase *der Mann* is changed into the indefinite *ein Mann*. (34a) below has no reading in which the men coming in and the men buying a book must be the same.

(34) a. Wenn ein Mann reinkommt, dann kauft immer ein Mann ein Buch.

if   a   man   in-comes   then buys always a   man   a   book

'If a man comes in, then a man always buys a book.'

b. immer $\underline{x}$ [wenn [$_S$ [ein Mann]$_{\underline{x}}$ [$_S \ \underline{x}$ reinkommt]]] $\exists \underline{y},\underline{z}$[dann [$_S$ [ein

Mann]$_{\underline{z}}$ [$_S$ [ein Buch]$_{\underline{y}}$ [$_S \ \underline{z} \ \underline{y}$ kauft]]]]

This is expected since, as seen in (34b), the index of *ein Mann* in the consequent is copied onto existential closure by quantifier indexing. It then can no longer be bound from outside by the quantificational adverb.

The goal of the remainder of this chapter is to show that the semantic difference between a reduced multi-event conditional and its full counterpart can be understood to be analogous to the semantic difference between the conditional in (34a) and the one in (31a): At the level of LF, they merely differ in the properties of a single variable.

2.4.2 <u>Situation Indices</u>

Heim's theory aims to explain the anaphoric behavior of noun phrases and as such is not meant to do justice to the intuition that some conditionals quantify over events. For example, the assumptions presented above do not account for the intuition that (31a) not only quantifies over men but also over events of men coming in. The simpler example in (35a) below illustrates the same point. In the theory just sketched, it is assigned the LF in (35b). (For convenience, *wenn* and *dann* are suppressed in the LFs in (35b) and below.)

(35) a.   Wenn Fido reinkommt, dann geht   Karl immer.

           if   Fido in-comes   then leaves Karl always

           'If Fido comes in, then Karl always leaves.'

      b.   immer   [$_S$ Fido reinkommt] ∃[$_S$ Karl geht]

By the rules in (32), (35b) is false just in case Fido comes in and Karl does not leave. Again, the perceived quantification over events is not reflected here. Moreover, Kratzer (1995) argues that representations like (35b) are not even well-formed. She advances the following well-formedness constraint on LFs, a "prohibition against vacuous quantification."

(36) For every quantifier Q, there must be a variable x such that Q binds an

      occurrence of x in both its restrictive clause and its nuclear scope.

      (Kratzer (1995, 131))

Since the LF in (35b) contains no variables in the first place, it is bound to violate the constraint in (36).[15] (36) thus suggests that the restrictive clause and the nuclear scope of a multi-event conditional host variables that are not introduced by noun phrases. Let me explore the hypothesis that they host variables ranging over situations that are associated with sentences. In particular, suppose that a situation variable appears as an index on the highest S of a restrictive clause or nuclear scope. Without further assumptions, conceivable LFs for (35b) are then the ones in (37), where $\underline{e}$ and $\underline{e}$' are situation variables.

(37) a. immer $\underline{e}$ [$_S$ Fido reinkommt]$_{\underline{e}}$ $\exists\underline{e}$'[$_S$ Karl geht]$_{\underline{e}}$'

 b. immer [$_S$ Fido reinkommt]$_{\underline{e}}$ $\exists$[$_S$ Karl geht]$_{\underline{e}}$'

In (37a), it is assumed that the situation index on an S is *indefinite* in the sense that like the index of an indefinite noun phrase, it undergoes the rule of quantifier indexing. In (37b), it is assumed that the situation index on an S is *definite* in the analogous sense. Notice that neither LF satisfies the constraint in (36): In (37b), the quantifier *immer* still does not bind any variable at all, in (37a) it binds an occurrence of $\underline{e}$ in the restrictive clause, but not in the nuclear scope.

While (37a,b) are thus not appropriate as they stand, (37a) can be extended into an LF that satisfies (36) and moreover represents the correct interpretation of (35a). (38) below is like (37a) except that in the nuclear scope, the clause $m_{\underline{e}}$ has been adjoined to S. It introduces an occurrence of $\underline{e}$ into the nuclear scope that renders (38) in accordance with (36).

[15] Notice that even if names were indexed, as originally assumed in Heim (1982), their indices would not undergo quantifier indexing and (36) would still be violated.

(38)   immer $\underline{e}$ $[_S$ Fido reinkommt$]_{\underline{e}}$ $\exists\underline{e}'[_S$ m$_{\underline{e}}$ $[_S$ Karl geht$]]_{\underline{e}'}$

As will be seen shortly, the semantic role of the new clause in the nuclear scope is to introduce the matching relation into the interpretation of (35a). Let me therefore call it the *matching clause*. In the spirit of Rothstein (1995), the matching clause might be thought of as a silent anaphoric adverbial, perhaps similar in structure and interpretation to overt anaphoric adverbials like *danach* ('thereafter').

Naturally, the intended semantic interpretation of (38) requires turning to the framework of situation semantics. Suppose that LF formulas do not express truth values as assumed in Heim (1982, ch.2), but rather propositions, that is, sets of situations. Even though formulas now do not directly expresses truth values, they do so indirectly: As before, let us consider a proposition true just in case it contains the actual world as an element. Accordingly, a statement of the form $|\alpha|^g=1$ is now to be considered a short way of stating that the actual world is an element of $|\alpha|^g$.

Let us now attend to the particulars of the LF in (38). The S in the restrictive clause and the lower S in the nuclear scope (without their indices) are interpreted as expected. They express the proposition that Fido comes in and the proposition that Karl leaves, respectively. I further assume that *m* denotes a contextually supplied matching relation and that the index on *m* denotes the second argument of that relation. Thus for any assignment g, the matching clause in (38) expresses the set of situations that match g($\underline{e}$).[16] Assuming that adjunction to S is interpreted by set intersection, the higher S in the nuclear scope (without the index) now expresses the set of situations that match g($\underline{e}$) and in which Karl leaves. It only remains to be specified how an index on S is interpreted. This is done in (39).

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[16] More precisely, in the spirit of Rothstein (1995), I assume that the context dependency of the matching relation is reflected by *m* being a variable that remains free in (38) and whose semantic value is therefore also determined by the variable assignment.

(39)   If α is an S and i is a situation index, then for any g:

$|\alpha_i|^g=1$ iff $g(i)::|\alpha|^g$.

Recall that the double colon relates a situation to a proposition it is an event for. Thus by (39), a sentence with index i is true with respect to an assignment g just in case g(i) is an event for the proposition expressed by that sentence. The restrictive clause of (38) is then true with respect to g just in case g($\underline{e}$) is an event for the proposition that Fido comes in and the indexed S in the nuclear scope is true just in case g($\underline{e}$') is an event for the set of situations matching g($\underline{e}$) in which Karl leaves. It now follows from (32) above that (38) has the truth conditions in (40a). This is to be compared with (40b), the truth conditions of (35a) according to (18) above.

(40) a. $\forall e[e::\{s: \text{Fido comes in in s}\} \rightarrow \exists e'[e'::\{s: \text{s matches e \& Karl leaves in s}\}]]$

      b. $\forall e[e::\{s: \text{Fido comes in in s}\} \rightarrow \exists e'[e' \text{ matches e \& } e'::\{s: \text{Karl leaves in s}\}]]$

The two meta language formulas in (40) are identical up to the parts following the existential quantifiers. In (40a), the matching condition partly characterizes the proposition that constrains e', in (40b) it constrains e' directly. Notice that (40a,b) become intuitively equivalent if in both cases, *matches e* is replaced with, say, *is on Monday*. Intuitively, something is an event of Karl leaving on Monday just in case it is on Monday and is an event of Karl leaving. In fact, this equivalence can be proven, using the fact that being on Monday is a *divisive* property of situations: If some situation has this property, then all its parts have it, too.[17] Recall now that above, I have suggested that the matching

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[17] More generally, it can be shown that (i) holds.

(i)   For any propositions p,q and any situation s, if p is divisive then:
        $s \in p$ & $s::q$ iff $s::p \cap q$.

condition requires some kind of spatio-temporal locality between situations. It is then plausible that for each situation e in the range of the matching relation, the situations that match e are located in a spatio-temporal domain that counts as local to e in the given utterance context. Naturally, if some situation is located in that domain, then all its parts are, too. In that case, the property of matching a given situation is divisive, just like the property of being on Monday. Assuming that it in fact is, the two formulas in (40) are equivalent and thus the LF in (38) has the desired interpretation.

It can also be shown that the present theory of LF derives (18) for multi-event conditionals that host indefinites. (41a) below is like (35a) except that *Fido* has been replaced by *ein Hund* ('a dog'). In the present theory, (41a) is assigned the LF in (41b), which in turn receives the interpretation in (42a). Again, this is to be compared with the interpretation predicted by (18) above, given in (42b).

(41) a.   Wenn ein Hund reinkommt, dann geht   Karl immer.

          if   a   dog   in-comes   then leaves Karl always

          'If a dog comes in, then Karl always leaves.'

     b.   immer $\underline{e},\underline{x}$ [[ein Hund]$_{\underline{x}}$ [$\underline{x}$ reinkommt]]$_{\underline{e}}$ $\exists \underline{e}'[m_{\underline{e}}$ [Karl geht]]$_{\underline{e}'}$

Proof: Let ≤ be the part-of relation among situations and < the proper part-of relation. Recall that for any situation s and proposition p, s::p just in case s∈p and there is no s'∈p with s'<s. Also, for any proposition p, p is divisive just in case s∈p entails s'∈p whenever s'<s.

Now suppose s∈p & s::q. Then s∈q and thus s∈p∩q. There can be no s' with s'<s & s'∈p∩q, for then it would also hold that s'∈q, contradicting s::q. This means that s::p∩q.

Conversely, suppose that s::p∩q. Then it holds that s∈p & s∈q. There can be no s' with s'<s & s'∈q, for then, since p is divisive, it would hold that s'∈p∩q, contradicting s::p∩q. This means that s∈p & s::q.

(42) a. $\forall e \forall x[e::\{s: x \text{ is a dog that comes in in } s\} \rightarrow \exists e'[e'::\{s: s \text{ matches } e \text{ \& Karl}$

leaves in s}]]

b. $\forall e[e::\{s: \exists x[x \text{ is a dog that comes in in } s]\}] \rightarrow \exists e'[e' \text{ matches } e \text{ \& } e'::\{s: \text{Karl}$

leaves in s}]]

To begin, (42a) is equivalent to (43a) below for the same reasons that (40a,b) are

equivalent. Further, since the second universal quantifier in (43a) does not bind a variable

to the right of the arrow, it may be replaced with a narrow scope existential quantifier as

in (43b). Finally, if something is a situation in which a particular dog comes in, then it is

also a situation in which some dog or other comes in and vice versa. Thus as desired,

(43b) is equivalent to (42b).

(43) a. $\forall e \forall x[e::\{s: x \text{ is a dog in } s \text{ \& } x \text{ comes in in } s\} \rightarrow \exists e'[e' \text{ matches } e \text{ \& } e'::\{s:$

Karl leaves in s}]]

b. $\forall e[\exists x[e::\{s: x \text{ is a dog in } s \text{ \& } x \text{ comes in in } s\}] \rightarrow \exists e'[e' \text{ matches } e \text{ \& } e'::\{s:$

Karl leaves in s}]]

Similar arguments show that the predictions of (18) are derived for multi-event

conditionals that contain an indefinite in the consequent or contain more than one

indefinite. I conclude that (18) follows from the present theory of LF and its

interpretation.[18] For lack of a better term, I will in the following refer to this theory as the

indefiniteness theory of multi-event conditionals.

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[18] More precisely, (18) follows to the extent it is descriptively adequate. As it stands, (18) does not account for quantification over individuals in multi-case conditionals, whereas the present theory does.

2.4.3 <u>Reduction and Logical Form</u>

The purpose of this section is to show that the indefiniteness theory not only derives the desired truth conditions of full multi-event conditionals but furthermore provides a basis for deriving (19) above. (19) characterizes the semantics of reduced multi-event conditionals in terms of the semantics of their full counterparts. It will be shown here that (19) can be made to follow from assumptions as to how the LF of a reduced multi-event conditional relates to the LF of its full counterpart. The hypothesis to be explored is stated in (44).

(44) For any two situation variables i,j, a reduced conditional has the LF in (i) if its full counterpart has the LF in (ii).

(i) immer i... $[_S ...]_i$ ∃... $[_S ...]_i$

(ii) immer i... $[_S ...]_i$ ∃j... $[_S ...]_j$

By (44), a reduced conditional has the same LF as its full counterpart except that the index on the S in the nuclear scope is identical with the situation index in the restrictive clause and is not copied onto existential closure. Let me show that (44) derives (19) by reexamining a particular pair of examples from above. The reduced conditional in (45a) and its full counterpart in (45b) once more repeat (23a,b). According to (18), (45b) has the truth conditions in (46b), and together with (19), this entails that (45a) has the truth conditions in (46a). (I have argued in section 2.3 that these truth conditions are indeed adequate.)

(45) a. !! Wenn ich was   zum Lesen mitnehme, dann immer meine Brille.

       if   I   something to   read   along-take then always my   glasses

       'If I take something to read, then it's always my glasses.'

b. Wenn ich was   zum Lesen   mitnehme, dann nehme ich immer meine

    if   I   something to   read   along-take then take   I   always my

    Brille   mit.

    glasses along

    'If I take something to read, then I always take my glasses.'

(46) a. $\forall e[e::\{s: \exists x[x$ is something to read that I take in $s\} \rightarrow e::\{s:$ I take my glasses

    in $s\}]$

  b. $\forall e[e::\{s: \exists x[x$ is something to read that I take in $s\} \rightarrow \exists e'[e'$ matches e &

    $e'::\{s:$ I take my glasses in $s\}]]$

This result falls out from the indefiniteness theory of multi-event conditionals together

with (44). For by the indefiniteness theory, (45b) has the LF in (47b) below which has the

truth conditions in (48b). For reasons familiar from above, (48b) is equivalent to (46b).

Further, since (45b) has the LF in (47b), (44) entails that (45a) has the LF in (47a), which

has the truth conditions in (48a). Again for familiar reasons, (48a) is equivalent to (49).

These truth conditions are now to be compared with the intended ones in (46a) above.

(47) a. immer $\underline{e},\underline{x}$ [[was zum Lesen]$_\underline{x}$ [ich $\underline{x}$ mitnehme]]$_\underline{e}$ $\exists[m_\underline{e}$ [ich meine Brille

    mitnehme]]$_\underline{e}$

  b. immer $\underline{e},\underline{x}$ [[was zum Lesen]$_\underline{x}$ [ich $\underline{x}$ mitnehme]]$_\underline{e}$ $\exists\underline{e}'[m_\underline{e}$ [ich meine

    Brille mitnehme]]$_{\underline{e}'}$

(48) a. $\forall e\forall x[e::\{s: x$ is something to read that I take in $s\} \rightarrow e::\{s:$ s matches e & I

    take my glasses in $s\}]$

  b. $\forall e\forall x[e::\{s: x$ is something to read that I take in $s\} \rightarrow \exists e'[e'::\{s:$ s matches e &

    I take my glasses in $s\}]]$

(49)   ∀e[e::{s: ∃x[x is something to read that I take in s} → e matches e & e::{s: I

take my glasses in s}]

The meta language formulas in (49) and (46a) are not logically equivalent. If e is an event

for the proposition that I take something to read, then (46a) merely requires that e be an

event for the proposition that I take my glasses while (49) in addition requires that e

match itself. Recall, however, the intuition phrased above to the effect that a situation e is

matched by those situations that are spatio-temporally local to e. If so, then any situation

that is both in the domain and range of the matching relation is bound to be matched by

itself and as a consequence, (49) is not any stronger than (46a).

It has thus been shown that for the particular pair of examples in (45), the

indefiniteness theory together with (44) derives the effect of (18) and (19) above.

Analogous arguments show the same for any other pair of a reduced multi-event

conditional and its full counterpart. It thus seems that (18) and (19) are derived in general.

2.4.4 Ellipsis and Definiteness

According to (44), the LF of a reduced multi-event conditional has the same *lexical*

content as the LF of its full counterpart and merely differs from it in terms of a situation

variable, a part that may be called *functional*. Let me attend to these two aspects of (44) in

turn.

It is expected that the restrictive clauses of a reduced conditional and its full

counterpart have identical lexical contents, for the two conditionals have identical

antecedents. What is perhaps more remarkable is that the lexical contents of their nuclear

scopes also coincide. Recall now that a reduced conditional is mapped into its full

counterpart by repeating parts of the antecedent in the consequent. Let us suppose that

something analogous in fact occurs in the grammar of reduced conditionals. Suppose that at LF, missing lexical material is copied from the antecedent of a reduced conditional into its consequent. This analysis is similar to Williams's (1977) analysis of silent verb phrases in English. It derives the similarity between a reduced conditional and its full counterpart stipulated in (44).

Let me now turn to the differences. At the end of section 2.4.1, it was announced that the semantic contrast between a reduced multi-event conditional and its full counterpart can be reduced to the definiteness versus indefiniteness of a variable at LF. In fact, according to the indefiniteness theory together with (44), the situation index in the nuclear scope of a full multi-event conditional undergoes quantifier indexing whereas the corresponding situation index in a reduced multi-event conditional does not. This is tantamount to saying that the former index is indefinite whereas the latter is definite.

However, this by itself does not yet derive the difference between LFs postulated in (44). The fact that the situation index in a reduced consequent is definite does not entail that it is identical to the situation index in the antecedent. Let us consider (31a) above again, repeated here as (50).

(50)   Wenn ein Mann reinkommt, dann kauft der Mann immer ein Buch.

         if   a   man in-comes   then buys the man always a book

         'If a man comes in, then the man always buys a book.'

Even though in the most natural interpretation of (50), the definite noun phrase *der Mann* is understood to be anaphoric to the indefinite *ein Mann*, this is not the only interpretation available. *Der Mann* may also receive a deictic interpretation, that is, it may refer to a particular contextually salient man. In Heim's theory, this reading is represented by an LF

in which *der Mann* bears an index that is different from the index on *ein Mann* and that remains free.

It may therefore be expected that the situation index in a reduced consequent can remain free as well. For example, it may be expected that (45a) above can be mapped into the LF in (51a), apart from the one in (47a).

(51) a.   immer $\underline{e},\underline{x}$ [[was zum Lesen]$_{\underline{x}}$ [ich $\underline{x}$ mitnehme]]$_{\underline{e}}$ $\exists$[m$_{\underline{e}}$ [ich meine Brille

mitnehme]]$_{\underline{e}'}$

b. $\forall$e[e::{s: $\exists$x[x is something to read that I take in s} $\rightarrow$ e' matches e & e'::{s: I

take my glasses in s}]

However, under current assumptions it is not in fact expected that (51a) represents an observable interpretation of (45a). For suppose that (51a) is evaluated in an utterance context in which a situation e' is salient and thus may serve as the value of $\underline{e}'$. Applying the relevant definitions and some equivalencies established above, (51a) is then assigned the truth conditions in (51b). Notice that (51b) is true only if every event for the proposition that I take something to read is matched by e'. Recall now that by Rothstein's (1995) matching hypothesis, the matching relation is a function. In the case at hand, this means that e' can match at most one event for the proposition that I take something to read. Moreover, recall de Swart's (1993) observation that a multi-event conditional is infelicitous unless there are at least two distinct events for the proposition expressed by the antecedent. It then follows that (51a) is false whenever felicitous. I have already argued in section 2.3.2 above that such an interpretation is not well-formed and thus will not be observed.

It is then in fact enough to stipulate that a reduced consequent is mapped into a nuclear scope whose situation index is definite. The resulting theory of reduced multi-event conditionals can then be summarized as in (52).

51

(52) If α is a reduced multi-event conditional, then

　　　(i)　　in the mapping to LF, the missing material in the consequent of α is

　　　　　　recovered by copying material occurring in the antecedent of α.

　　　(ii)　the reduced consequent of α maps to a nuclear scope whose situation index is

　　　　　　definite.

This hypothesis may appropriately be referred to as the *definiteness theory* of reduced

multi-event conditionals. That under a suitable construal of events, the definiteness theory

accounts for the observations on reduced multi-event conditionals reported in section 2.2

is the main result of this paper. Notice that while the definiteness theory is cast in the

framework of Heim (1982, ch.2), it presumably can be expressed in any framework that

accounts for the different ways in which definite and indefinite noun phrases enter into

anaphoric relations. Such frameworks include the ones laid out in Kamp (1981), Heim

(1982, ch.3), and Groenendijk and Stokhof (1991).

2.5 <u>Open Questions and Summary</u>

The analysis of reduced conditionals given in this chapter leaves a number of interesting

questions open. I will catalogue some of these questions below to set the stage for future

research on the topic.

　　　To begin, there is an intuition to the effect that the proposition expressed by the

consequent of a reduced conditional is more 'specific' than the proposition expressed by

the antecedent. This intuition manifests itself in the following contrast.

(53) a.　　Wenn ich ein Buch kaufe, dann immer einen Roman.

　　　　　　if　　I　a　book buy　　then　always a　　　novel

　　　　　　'If I buy a book, then it's always a novel.'

b. * Wenn ich einen Roman kaufe, dann immer ein Buch.

     if   I a   novel buy   then always a book

     'If I buy a novel, then it's always a book.'

The judgments indicated in (53) presuppose that a novel is a particular kind of book, rather than the other way round. If a book were considered a particular kind of novel, then the judgments would reverse: (53a) would be bad and (53a) would be good.

Notice that the ungrammaticality of (53b) is not explained by the above analysis. (53b) is predicted to be true just in case every event for the proposition that I buy a novel is an event for the proposition that I buy a book. Assuming that every novel is a book, this cannot fail to be true. One may now suspect that (53b) is bad precisely because it is uninformative. But this proposal is challenged by the observation that the full counterpart of (53b), given in (54), appears to be better than (53b) itself.

(54) Wenn ich einen Roman kaufe, dann kaufe ich immer   ein Buch.

     if   I a   novel buy   then buy I   always   a   book

     'If I buy a novel, then I always buy a book.'

This sentence may be acceptable in a 'logic tutor' scenario, embedded in a context like *Every novel is a book, therefore __*. But in my judgment, (53b) would be ungrammatical even in this context. Hence there is something missing in the above analysis of reduced conditionals.

Another shortcoming of this analysis is that it seems to leave contrasts like the one in (55) below unexplained. We have seen that (55a) above, which repeats (8a), is correctly predicted to be ungrammatical, but it is unclear why insertion of *auch* ('also', 'too') in (55b) renders the sentence acceptable.

(55) a. * Wenn ich den   Karl besuche, dann immer den   Peter.

        if   I   the-Acc Karl visit   then always the-Acc Peter

    b.   Wenn ich den   Karl besuche, dann immer **auch** den   Peter.

        if   I   the-Acc Karl visit   then always also   the-Acc Peter

        'If I call Karl, the I always call Peter, too.'

The contrast in (55) need not be incompatible with the above analysis. But at present, I cannot see whether the contrast falls out from independently motivated assumptions about the semantics of *auch*. An observation which might be relevant is that words like *auch* salvage ungrammatical examples in other cases of incomplete sentences. This is illustrated for English silent verb phrase in (56).

(56) a. ?? John arrived and Mary did.

    b.   John arrived and Mary did, too.

Other open questions arise from the fact that the analysis given is only designed for conditionals which quantify over events. It is known , however, that not all conditionals quantify over events in the colloquial sense. (See Lewis 1975; Kratzer 1978, 1995; de Swart 1993 among others.) Intuitively, the reduced conditional in (57) quantifies over students and perhaps over cars, not over events. It is therefore not clear that the proposed analysis applies to this case in the desired way.

(57) Wenn ein Student ein Auto besitzt, dann immer einen Käfer.

    if   a   student a   car   owns   then always a   Beetle

    'If a student owns a car, then it's always a Beetle.'

Another observation that makes the reduced conditional in (57) interesting is that it lacks a grammatical full counterpart. (58) shows that (57) becomes ungrammatical if the subject and the verb in the antecedent are repeated in the consequent.

(58) * Wenn ein Student ein Auto besitzt, dann besitzt ein Student immer einen

　　　if　　a　　student a　car　　owns　　then owns a　　student always a

Beetle

Käfer.

One may reason about the contrast between (57) and (58) as follows. Since there does not seem to be any anaphoric relationship between the antecedent and the consequent, (58) may be considered a violation of the prohibition against vacuous quantification stated in the previous section. The above analysis has it that a reduced conditional has an anaphoric event index where its full counterpart has a non-anaphoric one. If only vacuous quantification rules out (58), then this analysis correctly predicts that (57) is grammatical.

Of course, this analysis presupposes the unintuitive view that conditionals like (57) do quantify over events. There is also another empirical problem with the analysis. It fails to predict that the conditionals in (59) below are equally ungrammatical. (59a,b) are like (58) and (57), respectively, except that the indefinite *ein Student* ('a student') has been replaced with the pronoun *er* ('he').

(59) a. *　　Wenn er ein Auto besitzt, dann besitzt er immer einen Käfer.

　　　　　　　if　　he a　car　 owns　 then owns he always a　　Beetle

　　　b. *　　Wenn er ein Auto besitzt, dann immer einen Käfer.

　　　　　　　if　　he a car　　 owns　then always a　　 Beetle

The full conditional in (59a) is like (58) in that it does not establish any anaphoric relationship between the antecedent and the consequent. It is therefore expected to be as ungrammatical as (58). However, if reduction in the consequent makes an anaphoric event index available, then it is not clear why the reduced conditional in (59b) fails to be better than its full counterpart in (59a). It thus remains to be explained why the difference between an indefinite and a pronominal subject causes the grammaticality contrast between (57) and (58b).

The above analysis of reduced conditionals is limited in yet another way. It only considers conditionals which host the quantificational adverb *immer* in the consequent clause. Such an adverb ensures that a conditional is interpreted as generalizing over a large domain of actual events and their participants. But conditionals without quantificational adverbs may also receive epistemic interpretations in which case they refer to a single contextually determined situation (cf. Kratzer 1978, Kadmon 1987, among others). For example, (60) below asserts that if it is true that he buys a car now then it must be true that he now buys a Beetle.

(60) Wenn er ein Auto kauft, dann kauft er einen Käfer.

if   he a car   buys   then buys he a   Beetle

'If he buys a car, then he buys a Beetle.'

Conditionals with such an epistemic interpretation may also have reduced variants. As shown in (61), (60) in the epistemic interpretation stays grammatical if the subject and the verb in the consequent are left out. It remains to be seen to what extent the above analysis of reduced conditionals also lends itself to the analysis of such cases.

(61) Wenn er ein Auto kauft, dann einen Käfer.

     if   he a car   buys   then a   beetle

     'If he buys a car, then it's a Beetle.'

A final open question to be presented here, most directly addressing the topic of this dissertation, concerns the syntax of reduced conditionals. I have assumed above that a reduced conditional is related to its full counterpart by a process of ellipsis. The nature of this ellipsis remains to be elucidated. It appears that reduction in conditionals is similar to what Ross (1970) calls 'Gapping'. Gapping is the kind of ellipsis in coordinations illustrated in (62) where curly brackets enclose elided material.

(62) a.   John ate the beans and Mary {ate} the rice.

        b.   Yesterday, John ate the beans and today, {John ate} the rice.

A characteristic property of Gapping is that it must elide the verb whenever it elides anything. For example, (62b) contrasts with (63) below where the second coordinate hosts an overt verb but no overt subject. The contrast in (64) now shows that reduction in conditionals is restricted in the same way. It will therefore be interesting to study the syntactic analyses of Gapping offered in the literature and to examine to what extent they lend themselves to the analysis of reduction in conditionals.

(63) * Yesterday, John ate the beans and today, {John} ate the rice.

(64) a.   Wenn Hans was   isst, dann Reis.

            if   Hans something eats then rice

            'If Hans eats something then it's rice.'

b.　*　Wenn Hans was　　isst, dann isst Reis.

　　　if　　Hans something eats then eats rice

In particular, it remains to be seen whether the stipulation that ellipsis in a consequent clause forces its situation index to be definite can be derived from what can be established independently about conditions on Gapping and the analysis of conditionals.

In summary, this chapter has presented a first analysis of reduction in the consequents of German conditionals. Focusing on a semantically defined subclass of conditionals, a range of perceived differences between reduced conditionals and their non-reduced counterparts has been credited to a minimal difference at the level of logical form. There are two major remaining questions. First, can the analysis be extended beyond the semantically defined subclass of conditionals examined here? Second, can the effect of ellipsis on logical form stipulated in the present analysis derived from a general theory of ellipsis?

Leaving these questions for future research, the next chapter turns to a different issue in the theory of ellipsis. The question there is not what the conditions on and effects of a presumed process of ellipsis are, but rather whether such a process is operative to begin with. It will be argued that word order variations in coordinations that previously have been analyzed in terms of leftward movement are better analyzed in terms of Gapping.

CHAPTER 3

ELLIPSIS IN THE SYNTAX OF *EITHER ... OR*[1]

3.1 <u>Introduction</u>

In the literature on coordination, it is often taken for granted that disjunctive *either*
overtly marks the left edge of a disjunction (see for example Quine 1967, p. 44,
Dougherty 1970, Stockwell et al. 1973, Neijt 1979, and Sag et al. 1985). Let me refer to
this positional characterization of *either* as the LEFT BRACKET THESIS.[2] Another
assumption often made in the literature is that two phrases may be coordinated only if
they are of the same linguistic sort (see for example Chomsky 1957, Schachter 1977,
Partee & Rooth 1983, Sag et al. 1985, and Munn 1993). Let me refer to this as the
SYMMETRY CONDITION on coordination. There are some uncertainties as to what it
means for two phrases to be of the same linguistic sort, but there is agreement that a noun
phrase like *beans* is not of the same sort as a verbal projection like *ate rice* or *John ate
rice*. This is why the sentences in (1a,b) are puzzling. For the left bracket thesis suggests
that they are to be parsed as in (2a,b), but (2a,b) are incompatible with the symmetry
condition on coordination.[3]

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[1] This chapter is based on Schwarz (1999). I am indebted to all those mentioned there
for helpful comments.

[2] The left bracket thesis as formulated here leaves it open whether *either* is part of the
first disjunct or rather combines with the disjunction as a whole. Nothing hinges on this in
the arguments to be made in this study.

[3] Another puzzle arises from examples like *John either laughed or he cried*, discussed
in Larson (1985). Among the conceivable parses for this sentence are [[$_{IP}$ *John either
laughed*] or [$_{IP}$ *he cried*]] and *John either* [[$_{VP}$ *laughed*] or [$_{IP}$ *he cried*]]. The former
parse presupposes a weakening of the left bracket thesis, the latter a weakening of the
symmetry condition. It appears that neither option is in conflict with the arguments to be
made in this study, but see Larson (1985) for arguments in favor of the second parse.
Puzzles also arise from the comparison of *either/or* with other two-part coordinators like
neither/nor and *both/and*. Larson (1985) shows that *either/or* and *both/and* have
somewhat different distributions and a reviewer makes the same point with respect to

(1)   a.   John either ate rice or beans.

       b.   Either John ate rice or beans.

(2)   a.   John either [$_{VP}$ ate rice] or [$_{NP}$ beans]

       b.   either [$_{IP}$ John ate rice] or [$_{NP}$ beans]

Let me hereafter refer to sentences like (1a,b) as 'unbalanced' disjunctions. In the present study, I will contrast two possible ways of reconciling their existence with the symmetry condition on coordination. Both accounts agree that *either* must be adjacent to a disjunction at D-Structure. (Let us say that *either* is 'licensed' by this disjunction.) But the two accounts make different assumptions about the syntactic relation between *either* and its licensing disjunction at S-Structure.

In the first account, due to Larson (1985), the left bracket thesis (as an S-Structure condition) is abandoned. It is assumed that *either* may gain distance from its licensing disjunction at S-Structure by way of movement. Let us refer to this as the MOVEMENT THEORY of *either*/*or*-syntax. In the movement theory, the unbalanced disjunctions in (1a,b) are reconciled with the symmetry condition on coordination by assigning them the parses in (3a) and (3b), respectively.

(3)   a.   John either$_i$ ate t$_i$ [$_{NP}$ rice] or [$_{NP}$ beans]

       b.   either$_i$ John ate t$_i$ [$_{NP}$ rice] or [$_{NP}$ beans]

---

either/*or* and *neither*/*nor*. For example, *Either John laughed or he cried* contrasts with
**Both John laughed and he cried* and **Neither John laughed nor he cried*. I will leave the
investigation of such contrasts to future research.

In contrast, I will present an account of unbalanced disjunctions that takes the left bracket thesis to be correct. In that account, unbalanced disjunctions are the result of a syntactic reduction process by which parts of a second disjunct remain silent. (This account is similar in spirit to the way in which Seuren (1985) analyses a subset of unbalanced disjunctions.) Let us refer to it as the REDUCTION THEORY of *either/or*-syntax. In the reduction theory, the unbalanced disjunctions in (1a,b) are reconciled with the symmetry condition on coordination by assigning them the parses in (4a) and (4b), respectively, where curly brackets enclose reduced material. Thus, according to the reduction theory, the disjunctions licensing *either* in (1a) and (1b) are not NP-disjunctions, as the movement theory wants it, but a VP-disjunction and an IP-disjunction, respectively.

(4) a. John either [$_{VP}$ ate rice] or [$_{VP}$ {ate} beans]

  b. Either [$_{IP}$ John ate rice] or [$_{IP}$ {John ate} beans]

The result of the present study will be that the full range of data on unbalanced disjunctions challenges the movement theory and supports the reduction theory.[4]

The presentation proceeds as follows. Section 3.2 presents the movement theory as implemented in Larson (1985). Section 3.3 argues against Larson's particular version of the movement theory as well as against an enhanced version built on a suggestion in Munn (1993). Section 3.4 presents and evaluates the reduction theory. Section 3.5 shows how the left bracket thesis copes with some further data, not previously analyzed. Section 3.6 sketches some consequences of the results reached here.

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[4] This result is in line with proposals by Wilder (1994, 1995), who also postulates reduction in the analysis of coordinations previously analyzed as involving leftward movement. Wilder does not discuss unbalanced disjunctions, however, which are the focus of the present study.

3.2 <u>Larson's Movement Theory</u>

This section reviews the version of the movement theory offered in Larson (1985). Section 3.2.1 reviews Larson's account of the possible positions of *either* relative to what the movement theory parses as its licensing disjunction. Section 3.2.2 reviews Larson's account of *either/or*-scope which is built on the movement theory of *either/or*-syntax.

3.2.1 <u>The Position of 'Either'</u>

The movement theory of *either/or*-syntax predicts that the position of *either* relative to its licensing disjunction is restricted by locality conditions of the sort observed in other instances of syntactic movement.[5] To begin, the movement theory predicts that *either* may not be separated from its licensing disjunction by an island, i.e. by a syntactic domain which is known to allow overt wh-extraction only at the cost of reduced grammaticality. Larson points out that this prediction is borne out, as shown for complex noun phrases in (5) and for wh-islands in (6). (The examples in this section are all based on examples given in Larson 1985.)

(5)   a.   John revised his decision to cook either rice or beans.

       b. *   John either revised his decision to cook rice or beans.

(6)   a.   John was wondering whether to either resign or retire.

       b. * John was either wondering whether to resign or retire.

---

[5] Here and in the further discussion of the movement theory, 'licensing disjunction' is of course short for 'licensing disjunction according to the movement theory'.

For non-islands, i.e. syntactic domains which are transparent for wh-movement, the pattern of grammaticality is mixed. In particular, (7) and (8) show that *either* may extract from some clausal non-islands, but not from others.

(7) a. Bill said that Mary was either drinking or playing video games.

  b. Bill said that either Mary was drinking or playing video games.

  c. ?? Bill said either that Mary was drinking or playing video games.

  d. ?? Either Bill said that Mary was drinking or playing video games.

(8) a. John wanted to eat either rice or beans.

  b. John wanted to either eat rice or beans.

  c. John either wanted to eat rice or beans.

  d. Either John wanted to eat rice or beans.

Based on examples like (7) and (8), Larson arrives at the generalization that finite clauses block extraction of *either* whereas infinitival ones do not.[6] He implements this generalization by suitably modifying the definition of Antecedent Government given in Lasnik and Saito (1984). By stipulating that Antecedent Government is blocked by a clause boundary just in case that clause is finite, Larson derives his generalization from the Empty Category Principle (ECP).

Larson furthermore observes that no negation particle *not* or *n't* may intervene between *either* and its licensing disjunction. This is illustrated in (9) below.

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[6] Seuren (1985, p. 185) discusses examples similar to (7c) and (8a,c). I refrain from reviewing Seuren's analysis because it does not address restrictions on the position of *either* and is based on an assessment of the data differing considerably from Larson's and the one assumed here.

(9)　　a. (?) John didn't eat either rice or beans.

　　　　b. ??　John either didn't eat rice or beans.

　　　　c. ??　Either John didn't eat rice or beans.

Larson derives this observation from assumptions about the semantics of *either* and negation. In slightly simplified terms, Larson proposes that at LF, a trace left behind by *either* is a variable in the sense of predicate logic and that *either* is a quantifier which must bind that variable to avoid vacuous quantification. It follows that no operator other than *either* is allowed to bind the variable in the D-Structure position of *either*. This implies that at LF, no unselective quantifier may intervene between *either* and its licensing disjunction, since such a quantifier, by virtue of being unselective, binds off all the free variables in its scope. Larson now follows Heim (1982) in assuming that the scope of negation is closed by an unselective existential quantifier. Then the ungrammaticality of (9b,c) follows.

3.2.2. The Scope of 'Or'

　　　Larson argues that the movement theory of *either/or*-syntax is supported by facts of *either/or*-scope. Larson observes that certain *either/or*-disjunctions embedded in the complement of a control verb are scopally ambiguous. (8a) above is such a case.[7] In one of its readings, (8a) may be true if John was indifferent as to whether he would end up eating rice or end up eating beans. This reading comes about when *or* takes narrow scope with respect to the embedding verb *want*. In the wide scope reading, (8a) is true if John wants to eat rice or wants to eat beans. In this reading, (8a) typically indicates that the speaker doesn't know which of the two foods John wanted to eat.

---

[7] Seuren (1985, p. 185) suggests that *either* always disambiguates the scope of *or*. However, it seems that most speakers agree with Larson's intuition about (8a).

Larson now observes that among the cases in (5)-(9), (8a) is the only one in which this kind of scope ambiguity arises. He observes that (8c,d) only have the wide scope reading whereas in the other grammatical cases in (5)-(9), only the narrow scope reading lead Larson to the following descriptive generalization (Larson 1985, p. 224):

(10)   When *either* occurs displaced from its associated *or*, then its overt surface syntactic position explicitly 'marks' the scope of disjunction. On the other hand, when it occurs undisplaced and adjacent to its disjunction in surface form, then its potential surface positions delimit the potential scopes of *or*.

The first half of this generalization captures the cases (7b) and (8b-d). The second half captures the remaining grammatical examples in (5) to (9). Larson implements (10) by making the assumptions (11a-c) (cf. Larson 1985, p. 230).

(11)   a. *Either* may move away from its licensing disjunction at the syntactic level of Logical Form (LF).
        b. The LF position of *either* marks the scope of its licensing disjunction.
        c. If *either* moves to some position at S-Structure then it must stay there at LF.

(11a,b) perhaps don't need any additional comment. As for (11c), notice that it serves a double purpose. First, it keeps *either* from lowering at LF and thereby incorrectly generating narrow scope readings for (8c,d). On the other hand, (11c) also keeps *either* from further raising at LF if it has already done so at S-Structure. This avoids predicting a non-existing wide scope reading for (8b).[8]

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[8] As Larson points out, Lasnik and Saito (1984, p. 237) present evidence to the effect that a condition similar to (11c) plays a role in the grammar of wh-questions.

To conclude, Larson (1985) provides two arguments for the movement theory: First, it makes a correct prediction, namely the prediction that the surface position of *either* obeys locality effects reminiscent of those holding on movement. Second, assuming that the generalization in (10) is correct, the movement theory of *either/or-s*yntax leads to a simple theory of *either*/*or*-scope. It is especially the second point which makes the movement theory attractive. But in the following, it is argued that the movement theory nevertheless fails.

3.3 Where the Movement Theory Fails

In section 3.3.1, it is shown that Larson's implementation of the movement theory is based on an incorrect generalization on the possible positions of *either* with respect to its licensing disjunction. An enhanced version of the movement theory, built on a suggestion by Munn (1993) will be seen to be of greater descriptive and explanatory adequacy than Larson's (1985) proposal. But in section 3.3.2, it is argued that any version of the movement theory ultimately necessitates an ad hoc restriction on *either*-movement. This motivates the search for an alternative solution.

3.3.1 Locality Revisited

Although Larson convincingly argues that given (10), the movement theory leads to a simple theory of *either*/*or*-scope, his account of what the locality conditions on overt *either*-movement actually are rests on an incorrect empirical generalization. For not all infinitival clauses are transparent for *either*-movement. The examples in (12) show that *for*-infinitivals are not.

(12) a.   John wanted for you to eat either rice or beans.

     b. ?? John either wanted for you to eat rice or beans.

Notice that the data in (12) do not challenge Larson's generalization (10): Like a disjunction contained in a finite clause complement, the disjunction in (12a) cannot naturally be interpreted as having scope over the matrix verb. So (12) conforms with the generalization (10).

This still leaves the question how the ungrammaticality of (12b) can be derived. It will be left open here whether the Empty Category Principle could plausibly be employed.[9] For within the movement theory there is some natural alternative analysis of all the locality restrictions seen so far. This analysis is stated in (13), which follows a suggestion put forward in Munn (1993, p. 187).

(13)   *Either* may move at S-Structure by way of Quantifier Raising.

Based on May (1985), Munn takes Quantifier Raising (QR) to be the kind of movement that makes certain quantificational expressions interpretable and determines their scope with respect to other scope bearing elements. 'QR' usually refers to movement which is assumed to be covert, i.e. to take place at LF, and to target quantificational NPs. But Munn's hypothesis is that QR can target *either* as well, in which case it can take place overtly, i.e. at S-Structure. For perspicuity, covert movement of quantificational noun phrases will be referred to in the rest of this section as 'genuine QR'. Bare 'QR' will be used to cover both genuine QR and *either*-movement.

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[9] Two reviewers for *Linguistic Inquiry* suggest that an ECP account of (12b) is possible if *either* movement is considered head movement. As will be seen, whether or not they are right is ultimately immaterial for the present concerns. In any case, the data to be presented below suggest that the locality conditions on putative *either* movement are more similar to the locality conditions on quantifier scope than to the locality conditions on head movement.

Based on Larson's generalization (10), Munn motivates (13) exclusively with the similarity between the semantic impacts of *either*-movement and genuine QR: They are both taken to determine scope. However, (13) also makes a prediction about the locality conditions on *either*-movement. For without additional assumptions, they should equal the locality conditions on genuine QR. (14) shows that this prediction is borne out for the long distance cases.

(14) a.   Some girl wanted to watch every 007 movie.

b.   Some girl wanted for you to watch every 007 movie.

c.   Some girl maintained that she knew every 007 movie.

d.   Some girl revised her decision to watch every 007 movie.

e.   Some girl was wondering whether to watch every 007 movie.

What is of interest in (14a-e) is the scope of *every 007 movie* with respect to the matrix verb. A sure sign for the ability of *every 007 movie* to scope over the matrix verb is its ability to scope over the matrix subject *some girl*. This leads to a reading which can receive a paraphrase of the form *for every 007 movie there was some (possibly different) girl such that ...* Such a paraphrase is possible for (14a) showing that there, *every 007 movie* can scope over the matrix verb. For (14b-e) this paraphrase is not possible. (Observations like these are reported in May 1977.) Assuming that *every 007 movie* can scope over the matrix subject whenever it can scope over the matrix verb, this shows that *every 007 movie* cannot scope over the matrix verb in (14b-e). The comparison with (5)-(8) and (12) above suggests, then, that long distance *either*-movement and long distance genuine QR are restricted in the same way.

Either-movement and quantifier scope not only pattern together in the long distance cases. We have seen in (9) above that *either*-movement cannot cross negation. The examples in (15) may be taken to show that this holds for quantifier scope as well.

(15)   a.   I do not know every poem.

       b.   The police didn't arrest many of the demonstrators.

Quine (1967, p. 46) observes that in (15a), the object noun phrase *every poem* must take scope under negation. For (15a) cannot be understood as saying that I do not know any poem. It rather suggests that I do know some poem, although it entails that there is at least one I don't know. Jackendoff (1972, p. 328) reports an analogous observation with respect to (15b). This may be taken to suggest that in general, genuine QR cannot move object quantifiers past negation.[10] (16) now formulates a potential generalization which arises from the data seen so far.

(16)   *either* may be overtly separated from its licensing disjunction by a certain syntactic domain if and only if the scope of a quantificational NP may escape from that syntactic domain.

If the generalizations in (10) and (16) were both correct then the movement theory would make the grammar of *either/or* very simple. Assume that the locality conditions on genuine QR are explained. Then the locality conditions on *either/or-s*yntax are explained by Munn's (13) and the locality conditions on *either/or*-scope are explained by Larson's (11). Thus if (10) and (16) were correct, the movement theory would be likely to be correct as well.

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[10] Lasnik (1972, p. 45) and Fox (1995) among others offer examples which in their judgments, allow non-universal object quantifiers to scope over negation. Sponsors of (16) might argue that these readings are not the results of QR. However, since a clearer case against (16) will be made below, I will leave the issue unresolved.

3.3.2 <u>The Mismatch between QR and 'either/or' Locality</u>

However, the generalization (16) cannot be maintained. (17) and (18) present degraded unbalanced disjunctions which by Larson's and Munn's theories of *either*-movement are not expected to be degraded.[11]

(17) a. ? Either they answered my question or yours correctly.

   b. ? Either he found this or that at a flea market.

   c. ? Either he invited you or me to a party.

   d. ? Either this pleased Bill or Sue a lot.

(18) a. ?? Either this pissed Bill or Sue off.

   b. ?? Either she turned the test or the homework in.

   c. ?? Either they locked you or me up.

   d. ?? Either he gulped one or two down.

To begin, it can be seen that in the movement theory, the reduced grammaticality of (17a-d) and (18a-d) is due to *either*-movement. The sentences in (19) and (20) are the sources of (17a-d) and (18a-d) according to the movement theory. These sentences are well-formed.

(19) a.   They answered either my question or yours correctly.

   b.   The found either this or that at a flea market.

   c.   He invited either you or me to a party.

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[11] All of my informants find (18a-d) degraded to some extent. But while some find them merely marginal, others strictly reject them. The same holds for (17a-d) even though they are judged better than (18a-d) by most of my informants and even fully grammatical by a few. See section 4 for discussion of the contrast between (17) and (18).

d.   This pleased either Bill or Sue a lot.

(20) a.   This pissed either Bill or Sue off.

      b.   She turned either the test or the homework in.

      c.   They locked either you or me up.

      d.   He gulped either one or two down.

       But the movement theory will not apply to these examples in the desired way. In

Larson's theory, *either*-movement is blocked by islands, finite clauses and unselective

quantifiers in the sense of Heim (1982). No island, finite clause, or unselective quantifier

intervenes between *either* and its licensing disjunction in the cases in (17) and (18). In

Munn's theory, *either*-movement is blocked by whatever blocks quantifier scope. But the

examples in (21) and (22) show that quantifier scope is not restricted in the same way in

which the position of *either* is restricted in (17) and (18).

(21) a.   Some student answered every question correctly.

      b.   Some student found every book at a flea market.

      c.   Some friend invited every boy to a party.

      d.   Some dish pleased every guest a lot.

(22) a.   Something pissed every guest off.

      b.   Some student turned every homework in.

      c.   Some sheriff locked every gangster up.

      d.   Some boy gulped every coke down.

For example, (22a) and (18a) form a minimal pair only differing in the lexical choice for

the subject and object noun phrases. (22a) is naturally paraphrased as *for every guest*

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there was something pissing that guest off. This shows that it is not a restriction on QR as such which keeps *either* from moving past the subject in (18a). Analogous observations hold for the other cases in (21) and (22).

The data presented here show that the locality conditions on genuine QR are weaker than the ones on *either*-movement. The generalization in (16) must accordingly be weakened to (23).

(23)   *Either* may be overtly separated from its licensing disjunction by a certain syntactic domain only if the scope of a quantificational NP may escape from that syntactic domain.

The question is what theory of *either*-movement can account for (23) while excluding the cases in (17) and (18). Minimally, such a theory must name a property of the examples in (17) and (18) which keeps *either* from moving out of its disjunction past the subject and which comparable but well-formed unbalanced disjunctions lack. Evidently, what distinguishes (18a-d) and (17a-d) from the previous cases is that the phrase parsed as the disjunction licensing *either* is not final in its clause. Therefore the generalization in (24) suggests itself.

(24)   *Either* may not be distant from its licensing disjunction if that disjunction is not final.

Let us hereafter refer to (24) as the 'finality restriction' and to sentences like (17a-d) which violate it as 'limping' disjunctions. The descriptive adequacy of the finality restriction can be further supported by considering the examples in (25).[12] (25a-d) are like

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[12] Pointing to examples like *Either someone from accounting or marketing called*, a reviewer for *Natural Language & Linguistic Theory* notes that 'final' in (24) cannot

(17a-d) except that in each case, the optional material following the disjunction has been dropped, so that the disjunction becomes final. Given that (25a-d) are impeccable, let us consider (24) descriptively correct.

(25) a.   Either they answered my question or yours.

   b.   Either he found this or that.

   c.   Either he invited you or me.

   d.   Either this pleased Bill or Sue.

But crucially, a constraint on movement with the effect of (24) has not been shown to have reflexes in any domain other than the syntax of *either*/*or* itself.[13] Given the descriptive adequacy of (24), the movement theory of *either*/*or*-syntax *either* therefore necessitates an ad hoc restriction on movement, whose only purpose is to account for the reduced grammaticality of limping disjunctions.[14]

A further challenge for the movement theory arises from examples that can be generated by changing the word order in (17a-d) or (18a-d). For example, (26a-d) are like

always be taken to mean 'clause final'. This complication, however, will not affect the arguments to made in the following. Notice also that (24) ignores the contrast between (17) and (18). We will return to it in section 4.

[13] In particular, Kuno's (1973) Clause Nonfinal Incomplete Constituent Constraint does not apply here. This constraint is a generalization to the effect that it is not possible to extract from a nonfinal phrase that is followed by obligatory material. Whether or not this generalization is correct, it does not capture the examples in (17), where the medial disjunctions are followed by optional modifiers.

[14] The same holds for other variant of the movement theory proposed in Munn (1993, p. 188) and Winter (1998). Munn and Winter suggest that in unbalanced disjunctions, *either* originates in its surface position and that at LF. Munn further proposes that *either* becomes adjacent to its licensing disjunction due to raising of the latter, while Winter suggests that *or* by itself moves to *either*. Just as Larson's (1985) account, these analysis of unbalanced disjunctions leave the finality restriction unexplained.

(18a-d) except that in each case, *or* followed by what the movement theory parses as the second disjunct appears sentence finally. All my informants find (26a-d) clearly better than (18a-d).

(26) a.   Either this pissed Bill off or Sue.

     b.   Either she turned the test in or the homework.

     c.   Either they locked you up or me.

     d.   Either he gulped one down or two.

Within the movement theory of *either/or*-syntax, these examples are presumably to be analyzed as a combination of *either*-movement and extraposition of *or* together with the second disjunct.[15] The resulting parses are sketched in (27a-d).

(27) a.   Either this pissed Bill t_i off [or Sue]$_i$.

     b.   Either she turned the test t_i in [or the homework]$_i$.

     c.   Either they locked you t_i up [or me]$_i$.

     d.   Either he gulped one t_i down [or two]$_i$.

These parses raise the question what accounts for the contrast between (26a-d) and their putative sources in (18a-d). As far as I can see, the movement theory does not offer an answer.[16]

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[15] That extraposition of this kind is possible has recently been suggested in Munn (1993) and Zoerner (1995). See section 4 for discussion.

[16] A reviewer for *Linguistic Inquiry* notes that the disjuncts following *or* in (26a-d) must all be stressed. The reviewer then suggests that the contrast in question might have a prosodic cause. Suppose that a disjunct following *or* must receive stress and that stress prefers to be final. In that case, (18a-d) violate a condition on stress placement, a violation which is expected to be obviated by extraposition. This suggestion, however, does not

I conclude that it is worth looking for an alternative account of unbalanced disjunctions. Such an alternative account will be presented in section 3.4. It will be shown that all the data on *either*/*or*-syntax presented so far can be derived without abandoning the left bracket thesis.

3.4 The Reduction Theory

According to the reduction theory of *either*/*or*-syntax, unbalanced disjunctions do not come about by way of *either*-movement but result from a process of syntactic reduction which affects the second coordinate of an *either*/*or*-disjunction. For example, as announced in the introduction, the correct parses of (1a,b), repeated (28a,b) below, will be assumed to be (29a) and (29b), respectively.

(28) a.   John either ate rice or beans.

b.   Either John ate rice or beans.

(29) a.   John either [$_{VP}$ ate rice] or [$_{VP}$ {ate} beans]

b.   either [$_{IP}$ John ate rice] or [$_{IP}$ {John ate} beans]

It will be argued in the following that the reduction process operative in unbalanced disjunctions is what Ross (1970) calls GAPPING. In Ross's work, gapping is the grammatical process which is responsible for the lack of a verb in the second coordinates of examples like (30a,b). ((30a) is from Ross 1970, p. 250; (30b) is from Jackendoff 1971, p. 21.)

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capture the contrast between (18) and (20): In (20) the disjuncts following *or* easily bear stress though they too are not final.

(30) a.   Tom has a pistol and Dick a sword.

     b.   Some ate beans and others rice.

I follow Ross (1970) in considering gapping a process of 'deletion', a process which allows for material to be silent even though it is present at S-Structure. Gapping is taken to delete material in the second coordinate under identity with material in the first. This leads to the parses in (31a,b), which account for the fact that the meaning of the overt verb in (30a) and (30b) enters the interpretation of both coordinates.

(31) a.   Tom has a pistol and Dick {has} a sword.

     b.   Some ate beans and others {ate} rice.

Let me henceforth refer to the version of the reduction theory which identifies reduction with gapping as the GAPPING THEORY. In this section, the gapping theory will be motivated in two steps. It will first be argued in section 3.4.1 that for reasons other than *either*/*or*-syntax itself, gapping should be considered permissive enough to derive grammatical unbalanced disjunctions. Section 3.4.2 will then argue that for reasons other than *either*/*or*-syntax, gapping should also be considered restricted enough to account for the constraints on unbalanced disjunctions observed above. If these arguments are accepted then the adequacy of the gapping theory is established.[17]

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[17] Notice that this reasoning does not presuppose any specific analysis of gapping. In particular, the gapping analysis of unbalanced disjunctions is not logically dependent on the deletion analysis of gapping. The argument made here can only be challenged by arguing that gapping does not in fact have the descriptive characteristics which are attributed to it below. For analyses which do not (completely) reduce gapping to deletion, see for example Hudson (1976), Sag (1976), Pesetsky (1982), Reinhart (1991), and Johnson (1996).

3.4.1 <u>What Gapping Can Do</u>

The current aim is to show that gapping is permissive enough to derive the grammatical unbalanced disjunctions discussed above. In doing so, it is convenient to have some additional terminology. Following common practice, I will refer to the elided material in the second coordinate as the 'gap' and to the identical material in the first coordinate as that gap's 'antecedent'. Moreover, let me refer to the remaining overt phrases in the second coordinates as 'remnants'. Finally, I will call the coordinations to which gapping applies the 'targets' of gapping.

Let me now begin by pointing out that gaps may contain more than just a verb. For example, (32a-c) below show that they may contain object NPs, PP modifiers, and dependent clauses as well. On the other hand, the finite verb of the second coordinate is always included in the gap. This is illustrated in (33). ((32a-c) are from Jackendoff 1971, p. 24.)

(32) a.　John writes poetry in the garden and Max {writes poetry} in the bathroom.

　　 b.　Max writes poetry in the bathroom, and Schwarz {writes} radical pamphlets {in the bathroom}.

　　 c.　Jack begged Elsie to get married and Wilfred {begged} Phoebe {to get married}.

(33) a.　Bill devoured the peaches quickly and Harry {devoured the peaches} slowly.

　　 b. *　Bill devoured the peaches quickly and Harry devoured {the peaches} slowly.

Thus, a gap must contain the finite verb and may include other elements as well. This is compatible with the idea that cases like (28a,b) result from gapping. However, (28a,b) differ from the standard cases of gapping in (31)-(33) in several salient respects: In (31)-

(33), the coordinator is *and*, there are two remnants, and the gap excludes the subject. In (28a,b) the coordinator is *either/or*, there is only one remnant, and in (28b), the gap includes the subject. If (28a,b) result from gapping then each of the properties which set them apart from (31)-(33) should be attested in cases other than unbalanced disjunctions.[18]

In fact they are. (34) shows that gapping can target *either/or*-disjunctions and (35) shows that gaps may include subjects.[19] ((34b) is from Jackendoff 1971, p. 22; (34c) is from Neijt 1979, p. 25; (35a) is from van Oirsouw 1987, p. 146; (35b,c) are from Sag 1976, p. 265.)

(34) a. Either John has seen Harry or Bill {has seen} Sue.

      b. Either Sam plays the sousaphone or Jeckyll {plays} the heckelphone.

      c. Either John kissed Mary or Mary {kissed} Peter.

(35) a. On Monday I bought a car and on Tuesday {I bought} a motorcycle.

      b. At our house, we play poker, and at Betsy's house, {we play} bridge.

      c.   Yesterday, we went to the movies, and last Thursday {we went} to the circus.

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[18] Another difference is that is that deletion is at the left periphery of the coordinate in (29), but not in (31)-(33). As pointed out by a reviewer for *Natural Language & Linguistic Theory*, Sag (1976, pp. 203-209) argues that left-peripheral deletion has slightly different properties than medial deletion. As far as I can see, however, none of these differences affects the arguments made here. See also Neijt (1979, pp. 57-62) for discussion.

[19] A reviewer for *Natural Language & Linguistic Theory* points out that in the literature, silent subjects are sometimes credited to a process other than gapping, usually referred to as 'conjunction reduction'. Notice, however, that (35a-c) become ungrammatical if the gapped verbs are rendered overt while leaving the subjects silent. This suggests that it is in fact gapping that allows for the subjects in (35) to be silent, rather than some process independent of gapping. But see section 5 for disjunctions which are argued to host silent subjects not due to gapping.

What remains to be examined is whether it is possible for gapping to just leave one remnant. The existence of 'split coordinations' like (36a,b) suggests that this is possible. ((36a) is Munn from 1993, p. 15; (36b) is from Hudson 1976, p. 544.) Both Hudson (1976) and Neijt (1979) argue that split coordinations are instances of gapping and to my knowledge no argument has ever been offered to the effect that gapping must leave more than one remnant. (Reinhart 1991, and Johnson 1996 also take split coordinations to be instances of gapping.)

(36) a.   John bought a book yesterday, and a newspaper.

     b.   John came, and Bill (too).

It has nevertheless also been assumed that split coordinations come about through a process other than gapping: Munn (1993) and Zoerner (1995) both suggest that the split coordination in (36a) is derived from the source (37a) by extraposition of the coordinator together with the second coordinate. Example (36b) might receive a similar treatment and be derived from (37b).

(37) a.   John bought [$_{NP}$ a book and a newspaper] yesterday

     b.   [$_{NP}$ John and Bill] came (too).

We have already seen data that undermine the extraposition account. Because of (18), extraposition in the split coordinations in (26) must be assumed to be obligatory. Especially in the light of (20), I do not see how this requirement could be derived. In the gapping account, on the other hand, (18) is irrelevant for the analysis of (26) and no extra complication arises; (26a-d) may receive the parses in (38a-d).

(38) a.　Either [this pissed Bill off] or [{this pissed} Sue {off}].

　　b.　Either [she turned the test in] or [{she turned} the homework {in}].

　　c.　Either [they locked you up] or [{they locked} me {up}].

　　d.　Either [he gulped one down] or [{he gulped} two {down}].

　　Johnson (1996) presents another challenge to the extraposition account. He notes
that it fails to predict the pattern of grammaticality illustrated in (39) below. ((39a-c) are
based on Johnson 1996, p. 69.)

(39) a.　I introduced Carrie and Will to each other.

　　b. *　I introduced Carrie to each other and Will.

　　c. *　I introduced Carrie to each other and I introduced Will to each other.

Under the extraposition account, the ungrammaticality of (39b) enforces the ad hoc
restriction that a noun phrase conjunction with a group interpretation may not be
discontinuous at S-Structure. On the other hand, if (39b) is assumed to be related to (39c)
through gapping, then the ungrammaticality of (39b) follows automatically.[20]

　　I conclude that there are good reasons to assume that gapping is general enough to
capture unbalanced disjunctions.[21] Naturally, the next question should be whether

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[20] As pointed out in Neijt (1979), agreement facts also favor the gapping analysis of
split coordinations. For example, the extraposition analysis does not shed light on the
ungrammaticality of *_John are ill and Bill_, whereas the gapping analysis naturally relates
it to the ungrammaticality of *_John are ill and Bill are ill_. Also, based on examples like
*_John lives in London and works_, Hudson (1976) and Neijt (1979) conclude that no finite
verb can follow the coordinator in split coordinations. Again, this follows from the
gapping analysis but not from the extraposition analysis. (Thanks to a reviewer for
Natural Language & Linguistic Theory for reminding me of these facts.)

[21] Pointing to examples like _At most four men ate rice and beans_, two reviewers for
Natural Language & Linguistic Theory suggest that gapping as construed here is in
danger of generating incorrect interpretations. In fact, the gapping parse [_at most four men_

gapping is also restricted enough to derive the restrictions on unbalanced disjunctions observed in section 3.2 and 3.3. We will see in section 3.4.2 that this is in fact the case.

3.4.2 What Gapping Cannot Do

The following three subsections are dedicated to three different restrictions on unbalanced disjunctions presented above. Section 3.4.2.1 shows that the finality restriction on unbalanced disjunctions is a consequence of a general parallelism constraint on the coordinates of a gapping target. Section 3.4.2.2 shows that the ban on negation in unbalanced disjunctions is predictable from its distribution in gapping. Section 3.4.2.3 shows that the remaining locality conditions found in unbalanced disjunctions follow from general locality conditions on gapping remnants.

3.4.2.1 Gapping and Limping Disjunctions

Several scholars have observed that the coordinates of a gapping target must be in some sense parallel. (See for example Hankamer 1971, p. 22, Stillings 1975, p. 251 and Hudson 1976, p. 543.) The kind of parallelism in question is illustrated in (40) and (41). Notice first that the ungrammaticality of (40b) and (41b) is partly due to the gaps in the second coordinates. For if the verb of the first coordinate is repeated in the second, (40b) and (41b) become grammatical.

(40) a.   Some talked with you about politics and others {talked} with me about
             music.

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ate rice] and [{at most four men ate} beans] represents a non-existing reading in which the subject quantifier distributes over the coordinates. Notice, however, that this is a challenge for the present view only if silent quantificational subjects are independently attested in clear cases of gapping. This does not appear to be the case, as the ungrammaticality of *Yesterday at most four men ate rice and today beans* suggests.

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b. * Some talked about politics and others {talked} with me about music.

c   Some talked about politics and others {talked} about music.

(40) a   John dropped the coffee and Mary {dropped} the tea.

b. * John dropped the coffee and Mary clumsily {dropped} the tea.

The pattern of grammaticality found here can be described by requiring that each remnant has a 'correlate'. Following common usage, I take the correlate of a remnant R to be a phrase in the first coordinate which stands in the same structural relationship to the gap's antecedent in which R stands to the gap. For example, in (40a-c) the correlate of *others* is *some* and the correlate of *about music* is *about politics*. Notice now that in (40a,c) and (41a), every remnant has a correlate. But *with me* in (40b), *clumsily* in (41b) do not.[22]

Let me call remnants which lack a correlate 'dangling' remnants. (40) and (41) thus illustrate a prohibition of dangling remnants. In the light of this constraint, let us reexamine the limping disjunctions in (17) and (18) above. In (42) and (43), these examples are repeated and parsed in accordance with the gapping theory.

(42) a. ? Either [they answered my question] or [{they answered} yours correctly].

b. ? Either [he found this] or [{he found} that at a flea market].

c. ? Either [he invited you] or [{he invited} me to a party].

d. ? Either [this pleased Bill] or [{this pleased} Sue a lot].

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[22] This kind of parallelism in gapping follows from the theories advanced in Sag (1976) and Pesetsky (1982). In fact, these theories require that gapping targets be structurally isomorphic up to the internal structure of remnants and correlates. Sag's and Pesetsky's objectives are somewhat different from the present ones, however, and they do not explicitly motivate their theories with the kind of data presented here.

(43) a ?? Either [this pissed Bill] or [{this pissed} Sue off].

b. ?? Either [she turned the test] or [{she turned} the homework in].

c. ?? Either [they locked you] or [{they locked} me up].

d. ?? Either [he gulped one] or [{he gulped} two down].

Notice that in each of (42a-b) and (43a-b), the object noun phrase in the second coordinate is followed by a dangling remnant, viz. a full phrase in (42a-d) and a particle in (43a-d). In the gapping theory, it is therefore expected that these examples are degraded.[23]

The present analysis is further supported by the grammaticality of (25a-d) above, which are like (42a-d) except that the offending dangling remnants have been dropped. The gapping theory also predicts that (42a-d) improve if appropriate material is added to the first coordinates to supply the dangling remnants in (42) with correlates. This prediction is borne out as well, as shown by the examples in (44) below. Moreover, as already seen in section 3.4.1, the split coordinations in (26) above, which present a puzzle in the movement theory, receive a straightforward analysis in the gapping theory as well.

(44) a.   Either they answered my question incorrectly or yours correctly.

b.   Either he found this at a tag sale or that at a flea market.

c.   Either he invited you to a concert or me to a party.

d.   Either this pleased Bill a little or Sue a lot.

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[23] The examples in (43) may also be argued to be ungrammatical by virtue of hosting ungrammatical first disjuncts. For example, *this pissed Bill* in (43a) is ungrammatical because the verb lacks the obligatory particle *off*. This ungrammaticality may be expected to spread to (43a) as a whole. Similar observations hold for (43b-d). The same does not apply to (42a-d), however, which is why I focus on dangling remnants as the source of ungrammaticality.

Let us now turn to some complications. Even though the reduction theory straightforwardly predicts that limping disjunction fail to be fully grammatical, at first sight there appears to be a mismatch between the expected degree of ungrammaticality and the one actually found. I have illustrated the prohibition of dangling remnants with (40b) and (41b) above. But these cases are usually judged worse than limping disjunctions. How can (42a-d) and (43a-d) be better than (40b) and (41b) if in both cases, the source of the ungrammaticality is the same?

The answer must of course pay attention to the fact that the dangling remnants in (40b) and (41b) are medial (*with me* and *clumsily*) whereas the dangling remnants in limping disjunctions are final. In fact, as shown in (45), there are clear cases of gapping in which a final dangling remnant is allowed.

(45) a. ?   Some put milk and others put sugar in the tea.

     b.   Some put milk in the tea and others put sugar in the tea.

     c. ?   Some put milk and others ~~put~~ sugar in the tea.

In (45a), both coordinates contain the ditransitive verb *put* but only the second coordinate hosts an overt prepositional phrase. Given that (45a) is equivalent to (45b), it thus appears that to the extent that (45a) is well-formed, the final prepositional phrase in (45a) is syntactically associated with both coordinates.

Since Postal (1974), the process by which a phrase at the right periphery of a second coordinate comes to be syntactically associated with the first coordinate as well is best known as 'Right Node Raising'.[24] The sentence in (45c) now shows that gapping and

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[24] See also Hankamer (1971). Postal (1974) actually argues that the phrase in question is not inside the second coordinate but rather combines with the entire coordination. However, arguments given in Wexler and Culicover (1980) and Levine (1985) seriously challenge Postal's proposal. In any case, for the present purposes nothing hinges on what the correct analysis of Right Node Raising is.

Right Node Raising may combine. This in effect means that not all dangling remnants are disallowed: In (45c), the Right Node Raised phrase *in the tea* does not have an overt correlate. It must therefore be acknowledged that a dangling gapping remnant is tolerated to the extent that it can Right Node Raise. Moreover, since Right Node Raised material must be final, it is correctly predicted that the dangling remnants in (40b) and (41b) cannot be salvaged. But we may expect that the final dangling remnants in limping disjunctions can be.

We can then interpret the degrees of ungrammaticality found in (42) and (43) as reflecting the extent to which Right Node Raising may apply to the otherwise illicit dangling remnants.[25] In fact, this analysis is further supported by the very contrast between (42) and (43). For it can be independently established that it is harder to Right Node Raise the particles in (43) than than the full phrases in (42): The balanced sentence disjunctions in (46a-d) and (47a-d) below are the gapping sources of (42a-d) and (43a-d), respectively.

(46) a. ? Either [they answered my question] or [they answered yours correctly].

　　　b. ? Either [he found this] or [he found that at a flea market].

　　　c. ? Either [he invited you] or [he invited me to a party].

　　　d. ? Either [this pleased Bill] or [this pleased Sue a lot].

(47) a. ??　　Either [this pissed Bill] or [this pissed Sue off].

　　　b. ??　　Either [she turned the test] or [she turned the homework in].

　　　c. ??　　Either [they locked you] or [they locked me up].

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[25] Right Node Raising is also to be credited for the fact that the disjunctions in (43) are usually judged better than their first disjuncts in isolation. For example, *this pissed Bill* in (43a) is strictly ungrammatical in isolation, given that the particle verb *pissed* fails to be associated with *off*. In the disjunction as a whole, this association is established to the extent that Right Node Raising is possible.

d. ??   Either [he gulped one] or [he gulped two down].

The question marks in (46) and (47) indicate the extent to which it is possible to understand the final phrase or particle as combining with the first coordinate as well as the second.[26] This is harder in (47) than in (46). The present analysis therefore straightforwardly predicts that (43a-d) are worse than (42a-d).

One final complication needs to be addressed. The limping disjunctions presented so far all have initial *either*. Let us now consider limping disjunctions in which *either* appears between the subject and the verb. (48a-d) are like (42a-d) except for the position of *either*. They are judged better than (42a-d) by most speakers.

(48) a.   They either [answered my question] or [{answered} yours correctly].

b.   He either [found this] or [{found} that at a flea market].

c.   He either [invited you] or [{invited} me to a party].

d.   This either [pleased Bill] or [{pleased} Sue a lot].

In the present account, the contrast between (42) and (48) enforces the conclusion that Right Node Raising of the final phrases is harder in the former case than in the latter. Even though the judgments are subtle, this conclusion appears to be independently supported by the comparison between (46a-d) above and (49a-d) below, the gapping sources of (42a-d) and (48a-d), respectively.

(49) a.   They either [answered my question] or [answered yours correctly].

b.   He either [found this] or [found that at a flea market].

---

[26] The examples in (47) are in fact only grammatical to the extent that Right Node Raising can apply and associate the final particles with the particle verbs in the first disjuncts.

c.   He either [invited you] or [invited me to a party].

d.   This either [pleased Bill] or [pleased Sue a lot].

As indicated, in (46) it appears harder to interpret the final material as Right Node Raised than in (49). If so, the contrast between (42) and (48) is expected as well.

3.4.2.2 <u>Gapping and Negation</u>

An observation due to Siegel (1984) is that the sentence in (50) below may be paraphrased as in (51a) or as in (51b). The fact that (51a) is a possible paraphrase indicates that (50) may receive the parse in (52) below, where *can't eat* has gapped.

(50) Ward can't eat caviar and Sue beans.

(51) a.   Ward can't eat caviar and Sue can't eat beans.

        b.   It can't be that Ward eats caviar and Sue beans.

(52)   [Ward can't eat caviar] and [Sue {can't eat} beans]

That (51b) is a possible reading for (50) is unexpected. (See Oehrle 1987 and McCawley 1993 for similar observations.) It looks as though *can't* in (50) may take semantic scope over the coordination even though it is included in the first coordinate at S-Structure.

However, it can be argued on independent grounds that in (50), *can't* in fact need not be contained in the coordination at S-Structure. Siegel (1987) observes that in examples like (50), the subject of the second coordinate is in a position in which accusative case can surface. This is illustrated in (53), where pronominal subjects render case marking overt.

(53)   He can't eat caviar and her beans.

Since subjects of finite clauses usually bear nominative case, the accusative subject in (53) suggests that the second coordinate is not a finite clause. Assuming with Koopman and Sportiche (1991) that verb phrases host a subject position, the second coordinate could instead be taken to be a bare verb phrase. This is the conclusion Johnson (1996) draws. (Siegel 1987 makes a very similar suggestion, though in a different framework.) If it is accepted, the parse for (50) may look like (54). Since there, *can't* is generated in a position c-commanding the coordination, the reading in (51c) is accounted for. I will therefore consider (54) a possible parse for (50).

(54)   Ward$_i$ can't [$_{VP}$ t$_i$ eat caviar] and [$_{VP}$ Sue {eat} beans]

In particular, I will follow Johnson (1996) in the assumption that the subject of the first conjunct may asymmetrically extract to the sentence initial subject position. Notice that this extraction is to be classified as A-movement. While it has been known since Ross (1967) that asymmetrical A-bar extraction from a first coordinate is often ill-formed, there is no evidence to the effect that A-movement is restricted in the same way. In fact, evidence from Exceptional Case Marking, presented in Johnson (1996), suggests it is not.[27]

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[27] One of Johnson's examples is *Liz made Mason out to be intelligent and Sarah to be kind.* Here it appears that *Mason*, the subject of the first embedded coordinate, has moved past the particle *out* into the matrix clause while the subject of the second coordinate stays in situ. Notice that examples like *John will be arrested and confess to the crime* do not make the same point. If subjects always originate within the verb phrase, then *John* not only binds a trace in the passive verb phrase *be arrested* but also in the active verb phrase *confess to the crime*. Subject movement in this case is then not asymmetric in the relevant sense. See Burton and Grimshaw (1992) and McNally (1992) for discussion.

Siegel's observations with respect to (50) are significant in particular because they undermine earlier claims to the effect that sentence negation may never be included in a gap (see e.g. Ross 1970, Hudson 1976, and Sag 1976). On the other hand, what is of interest in the present context are certain examples in which negation is indeed prevented from gapping. Van Oirsouw (1987, p. 208) observes that the sentence in (55) unambiguously asserts that John hasn't seen Harry and Bill hasn't seen Sue. Thus, negation obligatorily must take wide scope with respect to the disjunction. Under current assumptions, this indicates that (55) has the parse in (56b) but not the one in (56a).

(55)   John hasn't seen Harry or Bill Sue.

(56)   a. ?? [John hasn't seen Harry] or [Bill {hasn't seen} Sue]

       b.   John$_i$ hasn't [t$_i$ seen Harry] or [Bill {seen} Sue]

In view of the well-formed parse in (52), the ill-formedness of (56a) is perhaps surprising. In fact, I do not know why there is a contrast between (56a) and (52). However, for the present concerns, it is enough to note that there appears to be a general ban on gapped sentence negation in disjunctions.[28]

Let us now turn to unbalanced disjunctions. Recall from above that in unbalanced disjunctions, no negation particle *not* or *n't* may intervene between *either* and *or*. The pertinent examples are (9a,b) above, repeated in (57) below. According to the movement theory, these examples are ungrammatical because *either* may not cross negation.

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[28] In the present view, examples like *John didn't eat rice or beans* also illustrate that negation cannot gap in disjunctions. As noted in Larson (1985), negation must take widest scope in such cases. (See Seuren 1974, Ladusaw 1980 and van Oirsouw 1987 for similar observations.) This indicates that the sentence lacks the parse *John didn't eat rice or {John didn't eat} beans*.

(57) a. ?? John either didn't eat rice or beans.

b. ?? Either John didn't eat rice or beans.

In the gapping theory, (57a,b) are also predicted to be ungrammatical. For gapping is generally impossible when negation occurs between *either* and *or*. This is illustrated by (58), which minimally differs from the well-formed (34a) above in the presence of negation, and from the well-formed (55) in the presence of *either*. (A contrast like the one between (58) and (55) is also reported in Stillings 1975.) In fact, under current assumptions, it is correctly predicted that (58) does not have a parse analogous to (52) or (54).

(58) ?? Either John hasn't seen Harry or Bill Sue.

(59) a. ?? either [John hasn't seen Harry] or [Bill {hasn't seen} Sue]

b. * either John$_i$ hasn't [t$_i$ seen Harry] or [Bill {seen} Sue]

First, in view of (56a) above, it is expected that (59a) is impossible. In (59a), negation has gapped, which has been seen to be illicit in disjunctions. And (59b) is incompatible with the left bracket thesis, given that there, *either* fails to be adjacent to a disjunction.

3.4.2.3 <u>Locality</u>

Gapping is subject to a set of locality constraints on gapping which are perhaps most easily described as constraints on remnants. These constraints put a limit on the depth to which a remnant may be embedded in its coordinate. To begin, (60a,b) below suggest that no remnant may be included in a syntactic island inside the second coordinate. ((60a) is based on Neijt 1979, p. 134, (60b) is based on Neijt 1979, p. 138.)

(60) a. * some revised their decision to cook rice on Monday and others {revised}

[{their decision to cook rice} on Tuesday]

b. * some were wondering whether to write to Bill and others {were wondering}

[{whether to write} to Mary]

In (60a), the remnant *on Tuesday* is contained in a complex noun phrase inside the second coordinate and in (60b), the remnant *to Mary* is contained in a wh-island inside the second coordinate. Let me refer to a syntactic domain which may not host a remnant when that domain is inside the second coordinate as a 'gapping field'. (60) thus shows that syntactic islands are gapping fields. Two more gapping fields are identified in (61). ((61a) is from Neijt 1979, p. 142; (61b) is from Johnson 1996, p. 14.)

(61) a.   *   the first letter says that you should pay tax and the second letter {says}

[{that you should pay} V.A.T]

b. * Vivek wanted for Nishi to buy the video, and Carry {wanted} [{for Nishi to

buy} the ice cream]

In the ungrammatical (61a), the remnant *V.A.T.* is contained in a finite clause which is part of the second coordinate and in the ungrammatical (61b), the remnant *the ice cream* is contained in a *for*-infinitival which is part of the second coordinate. This suggests that finite clauses and *for*-infinitivals are both gapping fields. On the other hand, notice that control infinitivals are not in general gapping fields; Ross (1970) observes that examples like (62a,b) are grammatical. In both cases, the remnant *plays* is part of a *to*-infinitival which is the complement of a control verb.

(62) a.   Some want to write novels, and others {want to write} plays.

b.   Some tried to write novels, and others {tried to write} plays.

Let us now attend to unbalanced disjunctions. Recall that *either* may be separated from *or* by a control infinitival, but not by an island, a finite clause, or a *for*-infinitival. In Munn's (1993) QR analysis, this has been seen to follow. There, an unbalanced disjunction of the surface shape specified in (63a) is parsed as in (63b) (where the nodes X and Y may coincide). In the QR analysis, (63b) is correctly ruled out just in case X or Y is a QR domain, i.e. an island, a finite clause, or a *for*-infinitival.

(63) a. [...either...α or β]

b. [...either$_i$ [$_X$...[$_Y$...[t$_i$ α or β]]]]

In the gapping theory, (63a) is parsed as in (64) below. There, the string α *or* β is not taken to be a constituent. α and β are included in distinct constituents of category X. They merely appear to form a disjunction because any intervening material has been reduced by gapping.

(64) [...either [$_X$...[$_Y$...α]] or [$_X$ {...} [$_Y$ {...} β]]]

In the gapping theory, (64) is ruled out if X or Y is a gapping field. We have seen that islands, finite clauses, and *for*-infinitivals are gapping fields, but control infinitivals are not. Therefore, the locality restrictions on the position of *either* follow from the gapping theory as well.[29]

To summarize the results reached so far, it has been shown that the process of gapping is restricted enough to account for the constraints on unbalanced disjunctions

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[29] The fact that QR domains and gapping fields show such a close match has led some authors to the conclusion that the analysis of gapping must involve QR in some way. See Sag (1976), Pesetsky (1982), and Johnson (1996) for relevant discussion.

reported in Larson (1985) as well as the finality restriction presented in section 3.3. It has also been argued that gapping should be considered general enough to derive the grammatical unbalanced disjunctions encountered so far.

3.5. <u>Missing Subjects in Disjunctions</u>

What remains to be discussed, however, are certain unbalanced disjunctions which are not accounted for by the gapping theory of *either/or*-syntax. The sentence in (65) below, taken from Heycock & Kroch (1993), is such a case. (65) differs from the unbalanced disjunctions discussed so far in that the finite verb in the second coordinate is overt.

(65)   Either he came or stayed home.

Since by the left bracket thesis, there is a subject missing in the second coordinate of (65), let me refer to such cases as 'missing subject disjunctions'. Notice that the gapping theory of *either/or*-syntax as presented above fails to account for missing subject disjunctions. For following the literature, I have argued in section 3.4.1 that gapping always eliminates the finite verb of the coordinate it reduces. Data like (65) therefore enforce the conclusion that there are second disjuncts in which no gapping has applied and which nevertheless host silent subjects.

In fact, there is some independent evidence in favor of that conclusion. The evidence comes from observations on anaphoric reference in disjunctions. To begin, Kamp and Reyle (1993) observe that usually, if the first coordinate of a disjunction hosts an indefinite noun phrase and the second coordinate a pronoun, the two cannot be anaphorically related. For example, the pronoun *he* in (66) cannot be understood as referring anaphorically to the agent introduced in the first coordinate. The sentence is only

only well-formed in a reading in which the pronoun refers to a particular contextually determined person.

(66) Either someone stole your hat or he robbed a bank.

But Kamp and Reyle (1993) also observe that under certain conditions, such an anaphoric link is possible: It is possible if the disjuncts can be interpreted as providing alternative descriptions of a particular event. (66) above does not lend itself to such an interpretation, but (67) below does. There, the two disjuncts may be understood as providing two alternative descriptions of your hat's disappearance. And in fact, unlike (66), (67) allows for the anaphoric link between the subjects of the two disjuncts.

(67) Either someone stole your hat or he took it thinking it was his.

Let us now turn to missing subject disjunctions. (68a,b) below are like (66) and (67) respectively, except that in both cases, the subject pronoun *he* has been left out. The sentence in (68b) can receive a natural interpretation in which it is equivalent with (67) in the anaphoric reading. By contrast, the sentence in (68a) is perceived as uninterpretable. More precisely, (68a) is uninterpretable unless the two verb phrases are taken to provide alternative descriptions of a particular event, which is implausible.

(68) a. # Either someone stole your hat or robbed a bank.
     b.   Either someone stole your hat or took it thinking it was his.

In other words, the missing subject disjunctions in (68) behave as if their second disjuncts contained subject pronouns that must be interpreted as anaphoric to the subject noun phrases in the first disjuncts. A natural conclusion to draw from this is that there are

silent subject pronouns in English and that these pronouns may appear in the second disjunct of a clausal disjunction where they must be coindexed with the subject of the first disjunct.

In fact, I am not aware of any alternative account of the data in (68). In particular, they do not fall out from the movement theory of *either*/*or*-syntax. (69a,b) present the sources of (68a,b) according to the movement theory. Since (69a,b) are both fully grammatical and interpretable without effort, the movement theory by itself does not offer an explanation for the data in (68).

(69) a.   Someone either stole your hat or robbed a bank.

  b.   Someone either stole your hat or took it thinking it was his.

I conclude that the data on anaphoric reference in missing subject disjunctions lend support to the assumption enforced by the left bracket thesis, viz. the assumption that in such cases, the second disjunct hosts a silent subject. If the argument presented here is accepted, missing subject disjunctions therefore pose no threat to the left bracket thesis and the reduction theory of *either*/

3.6 Concluding Remarks

Let me summarize the main points of this paper. I have shown that the data discussed in Larson (1985) and Munn (1993) are compatible with the left bracket thesis, by which *either* marks the left edge of its licensing disjunction. Unbalanced disjunctions do not enforce the conclusion that *either* may move away from its disjunction at S-Structure. The investigation of gapping and empty subjects has revealed that unbalanced disjunctions can instead be taken to host silent material at the left edges of their second disjuncts. I have moreover provided evidence against leftward movement of *either*, and

hence for the left bracket thesis, by showing that the distribution of *either* is subject to restrictions not previously attested in cases of movement. In the reduction theory, on the other hand, these restrictions fall out in a natural way.

Let me now conclude by pointing out that if the movement theory of *either/or*-syntax is given up in favor of the left bracket thesis and the reduction theory, then two additional proposals made in Larson (1985) have to be reconsidered.

First, recall that in Larson's (1985) theory, balanced *either/or*-disjunctions as in *John wanted to eat either rice or beans* take scope by way of *either*-movement at LF. But if there is no *either*-movement at the surface then much of the motivation for this particular analysis of *either/or*-scope has disappeared. I therefore consider it an open question again how the scope potential of balanced *either/or*-disjunctions is reflected in the syntax.

Second, Larson (1985) argues that the surface syntax of so-called 'alternative questions' is very similar to the surface syntax of unbalanced *either/or*-disjunctions. For example, Larson argues that a sentence like (70a) may be parsed as in (70b).

(70) a. I wonder whether John ate rice or beans.

   b. I wonder whether$_i$ John ate t$_i$ [rice or beans].

There, it is assumed that *whether* originates in a position adjacent to the object disjunction and subsequently raises to the initial position in the embedded clause. As a consequence, the disjunction takes widest scope which gives rise to the alternative question interpretation in which (70) says that I wonder which of the two foods John ate.

Larson notes, however, that alternative questions behave differently from unbalanced disjunctions with respect to locality conditions. He shows that unlike *either* in unbalanced disjunctions, *whether* in alternative questions may be separated from *or* by a finite clause boundary. Larson credits this to a difference in the way that *either* and

whether move. But we might also note that alternative questions are not subject to the

finality restriction that has been the focus of the analysis here. (71a-d) below contrast with

(18a-d) above.

(71) a.   I wonder whether this pissed Bill or Sue off.

      b.   I wonder whether she turned the test or the homework in.

      c.   I wonder whether they locked you or me up.

      d.   I wonder whether he gulped one or two down.

The embedded sentences in (71) all have the alternative question interpretation despite the

final particle which causes ungrammaticality in unbalanced disjunctions. We can now see

the difference between *either* and *whether* that Larson discusses along with the difference

between (71) and (18) as an indication that a reduction account is only appropriate for

unbalanced disjunction. On the other hand, if *either* does not move then Larson's

particular analysis of alternative questions loses some of its motivation. I therefore

consider it an open question how the interpretation of alternative questions is syntactically

represented.

CHAPTER 4

ELLIPSIS IN ODD COORDINATIONS IN GERMAN[1]

4.1 <u>Introduction</u>

　　Coordinating particles typically give rise to 'even' structures in which the particle appears between two overt constituents of the same syntactic category. This chapter is about less typical 'odd' cases in German which do not follow this pattern. The focus is on 'verbal' odd coordinations in which the coordinator has a complete non-finite verb phrase to its immediate right, but only a verb phrase fragment to its immediate left. A case in point is given in (1), where *und* 'and' appears between the non-finite verb phrase *sich hinlegen* 'lie down' and the transitive verb *essen* 'eat', which is separated from its object noun phrase *die Suppe* 'the soup' by the subject *der Hans* 'Hans' and the finite verb *wird* 'will'.

(1)　　Die Suppe wird der Hans essen und sich hinlegen.

　　　　the soup   will   the Hans eat   and self down-lie

　　　　'Hans will eat the soup and lie down.'

　　In the linguistic literature, it is generally assumed that even coordinations reflect the syntactic nature of coordinations more directly than odd ones. A 'symmetry condition' is postulated which requires that coordinates be constituents of like syntactic categories. Under this view, the symmetry of coordination is merely obscured in odd coordinations.

　　This chapter addresses the question of how symmetry is obscured in verbal odd coordinations like (1). Two conceivable analyses will be contrasted. One analysis, due to

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[1] This chapter is based on Schwarz (1998b). I am indebted to all those mentioned there for helpful comments.

Heycock and Kroch (1994), weakens Ross's (1967) Coordinate Structure Constraint by postulating asymmetric extraction from verb phrase coordinations. The other analysis, which is in the spirit of Wilder (1994), does not weaken the Coordinate Structure Constraint and relies on Ross's (1970) Gapping. The latter analysis will be argued to be preferable to the former. Thus, like the previous chapter, this chapter argues that a coordination construction previously analyzed in terms of movement to the left of the coordinator, should instead be analyzed in terms of ellipsis to its right.

The presentation proceeds as follows. In section 4.2, Heycock and Kroch's (1994) asymmetric extraction analysis will be laid out. In section 4.3, this analysis will be extended to cover another brand of odd coordinations which I will call 'nominal'. It will be shown that this extension fails and it will be argued that nominal odd coordinations are due to Gapping. Based on these results, section 4.4 discusses Heycock and Kroch's analysis of verbal odd coordinations. The data considered there are analogous to the data considered in section 4.3. The conclusion is therefore that there is no asymmetric extraction from verb phrases and that verbal odd coordinations are due to Gapping. Section 4.5 discusses remaining problems concerning the scope of negation and non-referential subjects. Section 4.6 addresses some complications due to Right Node Raising and constraints in Gapping, which for ease of exposition are suppressed in the previous text. Section 4.7 summarizes the chapter.

4.2 Asymmetric Extraction from Verb Phrases

In the view of Heycock and Kroch (1994), the verbal odd coordination in (1) is to be parsed as in (2). In this parse, the coordinates are (non-finite) verb phrases. The oddness of the coordination is taken to be due to syntactic movement which lets the object noun phrase *die Suppe* 'the soup' appear sentence initially rather than adjacent to its governing verb *essen* 'eat'.

(2)   [die Suppe]$_1$ wird der Hans [[$_{VP}$ t$_1$ essen] und [$_{VP}$ sich hinlegen]]

In this analysis, the sentence in (1) is the odd counterpart of the even coordination in (3), where the subject noun phrase is initial and each object is adjacent to its governing verb. The two sentences are taken to have the same D-structure and to differ only due to different reorderings at S-structure. The meanings of the sentences in (1) and (3) are compatible with this view, given that they are semantically equivalent.

(3)   Der Hans wird die Suppe essen und   sich hinlegen.
       the Hans will the soup   eat   and   self down-lie
       'Hans will eat the soup and lie down.'

    What is remarkable about this analysis of (1), however, is that it postulates movement which is asymmetric in the sense that it extracts an expression from only one of two coordinated constituents. Ross (1967) demonstrates that in English such asymmetric extraction is generally impossible.[2] In fact, the contrast between (4a) and (4b) below suggests that a constraint of this sort is operative in German.

(4)   a.   Die Suppe wird der Hans essen.
             the soup   will   the Hans eat
       b. * Die Suppe wird der Hans essen und wird der Peter sich hinlegen.
             the soup   will   the Hans eat   and will the Peter self down-lie

---

[2] Ross also observes that extraction from a coordination is possible if it leaves a trace in <u>both</u> coordinates (see also Williams 1978). Since this so-called Across the Board extraction does not affect the arguments made below, I will disregard in the following.

c.   [die Suppe]$_1$ [[$_{C'}$ wird der Hans t$_1$ essen] und [$_{C'}$ wird der Peter sich

hinlegen]]

Like (1) above, the sentence in (4a) shows that it is possible for an object noun phrase to be separated from its verb and to appear sentence initially. If we follow den Besten (1984) in construing the constituent to the right of the initial object noun phrase as C', then the ungrammaticality of (4b) shows that asymmetric extraction from a first C' coordinate, as postulated in the parse (4c), must be excluded.

Since Ross (1967) the prohibition of asymmetric extraction is known as the 'Coordinate Structure Constraint'. The Coordinate Structure Constraint in a strict reading is incompatible with Heycock and Kroch's analysis of (1). On the other hand, Munn (1993), Postal (1994), Zoerner (1995), and Johnson (1996), among others, discuss (English) examples in which asymmetric extraction appears to be well-formed. One may therefore speculate that, once appropriately weakened for independent reasons, the Coordinate Structure Constraint correctly distinguishes between the grammatical (1) and the ungrammatical (4b).[3]

However, the results to be reached below do not support this speculation. To prepare the argument against Heycock and Kroch's analysis, the following section examines another kind of odd coordination. I will return to cases like (1) in section 4.3.

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[3] Heycock and Kroch (1994) in fact discuss verbal odd coordinations like (1) only in order to show that the Coordinate Structure Constraint must be weakened. They do so to motivate their analysis of so-called 'SGF' coordinations, a construction briefly discussed in section 4 below.

4.3 Asymmetric Extraction from Noun Phrases?

This section discusses 'nominal' odd coordinations in which the coordinator is surrounded by nominal expressions, rather than verbal ones. An analysis is considered in which they are due to asymmetric extraction from noun phrases. This analysis will be shown to miss the empirical generalization that nominal odd coordinations must a have full grammatical sentence preceding the coordinator. It is proposed that asymmetric extraction from noun phrase coordinations is illicit and that nominal odd coordinations are derived from sentence coordinations by way of Gapping.

4.3.1 Nominal Odd Coordinations

An observation due to van Riemsdijk (1989) is that in German it is sometimes possible to extract the head noun of a noun phrase, leaving behind a determiner. This kind of 'noun phrase split' is illustrated in (5). In (5b) the determiner *drei* 'three' and the noun *Äpfel* 'apples' form a canonical object noun phrase. Since (5a) is equivalent to (5b), *Äpfel* and *drei* in (5a) plausibly form a constituent at D-structure and are non-adjacent due to fronting of the noun at S-structure.[4]

(5)   a.   Äpfel ißt der Hans drei.

           apples eats the Hans three

           'Hans eats three apples.'

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[4] Van Riemsdijk (1989) and Fanselow (1988) present data that are rather unexpected under the view that noun phrase split is the result of actual movement. But they also find striking similarities between noun phrase split and standard cases of movement. In fact, it will be seen below that the data considered here do not distinguish noun phrase split and extraction of prepositional phrases from noun phrases.

b.   Der Hans ißt   drei   Äpfel

    the Hans eats three apples

    'Hans eats three apples.'

Noun phrase split gives rise to coordinations similar to example (1) above. In (6) below, the coordinator is surrounded by the determiners *drei* and *zwei* 'two' but the two are clearly not the coordinates. The interpretation of (6) instead indicates that just as in (5a), *drei* is in construction with the fronted noun *Äpfel.*

(6)   Äpfel   ißt   der Hans drei   und zwei Bananen

    apples eats the Hans three and two bananas

    'Hans eats three apples and two bananas.'

This means (6) is an odd coordination in the sense introduced above. A complete noun phrase appears to the immediate right of the coordinator, but only a noun phrase fragment to its immediate left. I will refer to such cases as 'nominal' odd coordinations.

    Heycock and Kroch's (1994) analysis of verbal odd coordinations directly points to an analysis of nominal odd coordinations: (6) might be parsed as in (7) below, where it is assumed that *und* coordinates two noun phrases and that *Äpfel* appears sentence initially due to asymmetric extraction from the first coordinate. In that analysis, (6) is the odd counterpart of the even coordination in (8) where the subject is initial and each head noun is adjacent to its determiner.

(7)   Äpfel$_1$ ißt der Hans [[$_{NP}$ drei t$_1$] und [$_{NP}$ zwei Bananen]]

(8)   Der Hans ißt   drei   Äpfel   und zwei Bananen.

       the Hans eats three apples   and two bananas

       'Hans eats three apples and two bananas.'

       Noun phrase split is not the only kind of movement giving rise to nominal

odd coordinations. The semantic equivalence of (9a) and (9b) below suggests that

in (9a), the partitive prepositional phrase *von den Sängern* has been fronted

leaving behind the determiner *alle* 'all'. Following Pafel (1996), let me refer to

this kind of movement as 'partitive split'.

(9)   a.   Von den Sängern kennt er alle.

             of   the singers   knows he all

             'He knows all of the singers.'

       b.   Er kennt alle von den Sängern.

             he knows all of   the singers

             'He knows all of the singers.'

The example in (10) below is a nominal odd coordination in the same sense as (6) above.

The coordinator is surrounded by the determiners *alle* and *viele* 'many', but the

interpretation of (10) reveals that these determiners are not the coordinates. As in (6), the

coordinator has a complete noun phrase to its immediate right but only a noun phrase

fragment to its immediate left.

(10) Von den Sängern kennt er alle und viele von den Musikern.

      of   the singers   knows he all and many of the musicians

      'He knows all of the singers and many of the musicians.'

Again, in a natural extension of Heycock and Kroch's (1994) view, (10) receives the parse in (11) where the partitive phrase has been extracted from the first of two coordinated object noun phrases. In this analysis, (10) is the odd counterpart of the even coordination in (12), where the subject is initial and each partitive phrase appears inside its noun phrase.

(11) [von den Sängern]$_1$ kennt er [[$_{NP}$ alle t$_1$] und [$_{NP}$ viele von den Musikern]]

(12) Er kennt alle von den Sängern und viele von den Musikern.

       he knows all of   the   singers and many of   the musicians

       'He knows all of the singers and many of the musicians.'

Examples like (6) and (10) are cases, then, which superficially resemble (1) and we might therefore want to extend the account to them. But we will see in the next section that Heycock and Kroch's (1994) account should not be so extended.

4.3.2 <u>Unexpected Restrictions</u>

The even noun phrase coordinations in (13a,b) below are isomorphic to the even noun phrase coordination in (8) above, except that they have additional final material. (13a) hosts the final non-finite verb *essen* 'eat' and (13b) hosts the final particle *ein*.

(13) a.   Der Hans wird drei   Äpfel   und zwei Bananen essen.

          the Hans will three apples and two Bananas eat

          'Hans will eat three apples and two bananas.'

b. Der Hans dost drei   Äpfel   und zwei Bananen ein.

the Hans cans three apples and two   bananas in

'Hans cans three apples and two bananas.'

And the sentences in (14) below are like (5a) above in that they involve split object noun phrases. They are in fact almost isomorphic to (5a), only differing from it by some additional final material. (14a) is like (13a) in that the non-finite verb *essen* appears finally, while (14b) is like (13b) in that it ends in the particle *ein*.

(14) a.   Äpfel wird der Hans drei essen.

apples will the Hans three eat

'Hans will eat three apples.'

b.   Äpfel dost der Hans drei ein.

apples cans the Hans three in

'Hans cans three apples.'

In view of (13) and (14), under the asymmetric extraction analysis, it is now incorrectly expected that the nominal odd coordinations in (15a,b) below are as grammatical as those in (6) above, for it is expected that they can receive the parses in (16), which closely resemble those in (7).

(15) a. * Äpfel wird der Hans drei   und zwei Bananen essen.

apples will the Hans three and two bananas eat

b. * Äpfel dost der Hans drei und zwei Bananen ein.

apples cans the Hans three and two bananas in

(16) a.   Äpfel$_1$ wird der Hans [[$_{NP}$ drei t$_1$] und [$_{NP}$ zwei Bananen]] essen

      b.   Äpfel$_1$ dost der Hans [[$_{NP}$ drei t$_1$] und [$_{NP}$ zwei Bananen]] ein

Because of the data in (13) it cannot be argued that (16a,b) postulate illicit D-structures. And because of the data in (14), (16a,b) cannot be seen to violate a general constraint on noun phrase split. It therefore appears that under the asymmetric extraction analysis, (15a,b) must be ruled out by a special condition on asymmetric extraction. But as far as I can see, there is no independent motivation for a constraint of the kind needed here.

   Partitive split gives rise to examples that are fully analogous to the noun phrase split cases in (15). Again, the asymmetric extraction analysis fails to predict that the nominal odd coordinations in (17) are ungrammatical. It is expected that they can have the parses in (18), which closely resemble those in (11).

(17) a. * Von den Sängern sollte   er alle und viele von den Musikern kennen.

           of   the   singers should he all and many of   the musicians know

      b. * Von den Sängern schnauzt er alle und viele von den Musikern an.

           of   the singers   yells   he all and many of   the musicians at

(18) a.   [von den Sängern]$_1$ sollte er [[$_{NP}$ alle t$_1$] und [$_{NP}$ viele von den Musikern]]
           kennen

      b.   [von den Sängern]$_1$ schnauzt er [[$_{NP}$ alle t$_1$] und [$_{NP}$ viele von den
             Musikern]] an

Again, it appears that the asymmetric extraction analysis would have to rule out (18) with an ad hoc condition on asymmetric partitive split, for as shown in (19), the putative even counterparts of (17a,b) are grammatical. Thus it cannot be argued that (18) postulates illicit D-structures. And as shown in (20), (17a,b) both become grammatical if the

coordinator and the noun phrase following it are omitted. Hence (18a,b) do not violate a general constraint on partitive split.

(19) a. Er sollte   alle von den Sängern und viele von den Musikern kennen.

        he should all of   the   singers   and many of the   musicians know

        'He should know all of the singers and many of the musicians.'

    b. Er schnauzt alle von den Sängern und viele von den Musikern an.

        he yells   all of   the singers   and many of the musicians at

        'He yells at all of the singers and many of the musicians.'

(20) a. Von den Sängern sollte   er alle kennen.

        of   the singers   should he all know

        'He should know all of the singers.'

    b. Von den Sängern schnauzt er alle an.

        of   the singers   yells   he all at

        'He yells at all of the singers.'

I conclude that the asymmetric extraction analysis fails to shed light on the contrast between the grammatical nominal odd coordinations in (6) and (10) on the one hand, and the ungrammatical ones in (15) and (17) on the other. In that analysis, the only relevant difference seems to be that the coordinations are final in the good cases and medial in the bad ones. There are no independent reasons for thinking that extraction in German can be sensitive to this difference. We will see, however, that there is another approach to odd coordinations in which these contrasts are expected.

4.3.3 <u>Nominal Odd Coordinations and Gapping</u>

The good and bad nominal odd coordinations presented so far consistently differ in a way that has been disregarded in the preceding discussion. In the grammatical cases, but not in the ungrammatical ones, the material preceding the coordinator forms a grammatical main clause on its own. (5a) and (9a) above show that in both (6) and (10), the material preceding the coordinator can appear in isolation. (21a,b) demonstrate that this does not hold for the ungrammatical (15a,b). (22a,b) make the same point for the ungrammatical (17a,b).

(21) a. * Äpfel wird der Hans drei.

         apples will the Hans three

      b. * Äpfel dost der   Hans drei.

         apples cans the Hans three

(22) a. * Von den Sängern sollte   er alle.

         of   the singers   should he all

      b. * Von den Sängern schnauzt er alle.

         of   the singers   yells   he all

The ungrammaticality of these cases does of course not come as a surprise. Comparison with (14a,b) and (20a,b) above reveals that in each case, some element is absent that the verb requires to be present. In (21a) and (22a), what is missing is the verbal complement of the modals *wird* 'will' and *soll* 'should', respectively. And the denominal verbal elements *dost* and *schnauzt* in (21b) and (22b) are not words on their own but only in combination with the missing particles *ein* and *an*, respectively.

Under the asymmetric extraction analysis, an account of the data in (15) and (17) cannot plausibly be based on the ungrammaticality of (21a,b) and (22a,b), for by the

parses in (16) and (18), the maximal strings preceding the coordinator in these cases do not form constituents. It is then not expected that it matters whether or not these strings form complete main clauses on their own.

It in fact seems to hold in general that a nominal odd coordination has a string preceding the coordinator that forms a grammatical sentence in isolation. This generalization, let me call it the 'rule of independence', is missed by the asymmetric extraction analysis.

Moreover, there is a simple way of deriving the rule of independence as instantiated in (15) and (17): Suppose that the Coordinate Structure Constraint is not weakened and that there is no asymmetric extraction after all. In that case, the noun phrase split in (15) and the partitive split in (17) must involve movement within the first coordinate. Since the extracted material is always initial, it follows that in each case the maximal string preceding the coordinator forms the first coordinate.

If this is so then the data in (21) and (22) show that the first coordinates in (15) and (17) fail to be grammatical sentences on their own even though they all contain subjects and finite verbs. But if the first coordinate of a sentence coordination is ungrammatical in isolation we might expect that this ungrammaticality spreads to the coordination as a whole.

Readers familiar with, say, Postal (1974) will be aware that the latter expectation is not always borne out. It is known that in English as well as in German, the first part of a sentence coordination may sometimes be ungrammatical in isolation. For ease of exposition, however, let me suppress this complication for now and defer relevant discussion to section 4.6. Suppose then that a sentence coordination must in fact always have a first coordinate that can stand on its own.

While this derives the data in (15) and (17), it remains to be seen whether it also leads to an account of the grammatical cases in (6) and (10). By the above reasoning, if there is no asymmetric extraction, then the maximal strings preceding *und* in (6) and (10)

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must be the first coordinates. It is encouraging to see that these strings are well-formed sentences in isolation, but one now needs to attend to the second coordinates. By the symmetry condition, the second coordinates should also be finite sentences. But all we find following the coordinator in (6) and (10) are the bare noun phrases *zwei Bananen* and *viele von den Musikern*, respectively. Can sentences consist of bare noun phrases?

Ross (1970) in fact observes that when sentences are second coordinates they may lack pieces that are otherwise obligatory. This is illustrated in (23a), which looks like a coordination of sentences except that the second coordinate lacks an overt finite verb. Ross postulates a rule of Gapping by which the finite verb in a second coordinate may delete. Deletion is assumed to take place under identity with material in the first coordinate. This accounts for the semantic equivalence between (23a) and (23b) where the finite verb in the first coordinate is repeated in the second. The resulting parse for (23a) is given in (23c), where the Gap appears between curly brackets.[5]

(23) a.   Der Hans ißt drei Äpfel und der Peter zwei Bananen.
          the Hans eats three apples and the Peter two bananas
          'Hans eats three apples and Peter two bananas.'

     b.   Der Hans ißt drei Äpfel und der Peter ißt   zwei Bananen.
          the Hans eats three apples and the Peter eats two bananas
          'Hans eats three apples and Peter eats two bananas.'

     c.   [der Hans ißt drei Äpfel] und [der Peter {ißt} zwei Bananen]

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[5] More recent references on Gapping in English include e.g. Hankamer (1971, 1973), Stillings (1975), Hudson (1976), Neijt (1979), Sag (1980), Pesetsky (1982), Steedman (1990), and Johnson (1996). For Gapping in German, see in particular Höhle (1983, 1991) and Wunderlich (1988).

In view of examples like (23a), it is at least conceivable that the second coordinates in (6) and (10) are finite clauses reduced by Gapping. The task is now to argue that (24a,b) below are in fact plausible parses for (6) and (10), respectively.

(24) a.   [Äpfel ißt der Hans drei] und [{der Hans ißt} zwei Bananen]

      b.   [von den Sängern kennt er alle] und [{er kennt} viele von den Musikern]

These parses in (24) differ from the standard Gapping parse (23c) in various respects. To begin, unlike the Gap in (23c), the Gaps in (24) include the subjects. Accordingly, while the second coordinate in (23c) hosts two 'remnants', namely the subject and the object noun phrase, the second coordinates in (24a,b) contain only an object remnant. Is it reasonable to assume that Gapping may delete the subject and leave behind a single remnant?

In the literature on Gapping, it is in fact commonly assumed that in an example like (25a) the Gap can be medial, in which case it includes the subject noun phrase *ich* 'I'. The resulting parse is given in (25b).[6]

(25) a.   Am   Morgen esse ich Äpfel und am   Abend   Bananen.

            in-the morning eat I   apples and in-the evening bananas

            'In the morning I eat apples and in the evening bananas.'

      b.   [am Morgen esse ich Äpfel] und [am Abend {esse ich} Bananen]

It is also commonly assumed that 'split coordinations' like (26a,b) below can be due to Gapping.[7] (26a,b) are odd in that the coordinator *oder* 'or' has a noun phrase to its

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[6] English examples of this kind are discussed in e.g. Oirsouw (1987), Sag (1980), and Johnson (1996). Each of these authors concludes that Gaps may include subjects.

immediate right but no noun phrase to its immediate left: In (26a) the non-finite verb *essen* appears to the immediate left of the coordinator, in (26b) it is the particle *ein*.

(26) a. Entweder der Hans wird drei   Äpfel essen oder zwei Bananen.

            either   the Hans will three apples eat   or   two   bananas

            'Either Hans will eat three apples or two bananas.'

     b. Entweder der Hans dost   drei   Äpfel   ein oder zwei Bananen.

            either   the Hans cans three apples   in or   two   bananas

            'Either Hans cans three apples or two bananas.'

Moreover, these sentences start out with disjunctive *entweder* 'either' which is plausibly taken to mark the left edge of the first coordinate.[8] If so, the first coordinate is a sentence in each case and by the symmetry condition, the second coordinate must be a sentence as well. This suggests that (26a,b) have the parses in (27a,b) where Gapping eliminates the subject and the finite verb as well as *ein* and *essen*, respectively. Thus (26a,b) motivate the assumption that Gapping may delete a subject together with the verb, leaving behind a single remnant.

(27) a. entweder [der Hans wird drei Äpfel esssen] oder [{der Hans wird} zwei

              Bananen {essen}]

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[7] For English, this view is explicitly defended in Hudson (1976), Neijt (1979), Moltmann (1992), and Johnson (1996). For German, see Höhle (1983) and Wunderlich (1988). The assumption that split coordinations in English cannot arise through Gapping is implicit in the analyses of Sag (1980), Munn (1993), and Zoerner (1995). But as far as I can see, these authors do not present arguments for their position. Split coordinations are also known under the names 'stripping' and 'bare argument ellipsis'.

[8] In chapter 2, I argue that English *either* marks the left edge of a disjunction and that parses analogous to those given in (27) are possible in English.

b.   entweder [der Hans dost drei Äpfel ein] oder [{der Hans dost} zwei Bananen {ein}]

There is another difference between (23c) and (24a,b) which may potentially stand in the way of a Gapping analysis of odd coordinations. In (23c), the two coordinates are structurally isomorphic. The two remnants in the second coordinates have 'correlates' in the first that occupy parallel syntactic positions. The parses in (24), on the other hand, do not show the same degree of isomorphism. In both cases, the remnants are noun phrases of canonical shapes whereas their correlates are discontinuous due to noun phrase split or partitive split. Is it reasonable to assume that Gapping applies despite such a lack of isomorphism between the coordinates?[9]

The examples in (28) below suggest that it is. As in the standard Gapping case in (23a), the second coordinates in (28a,b) are most naturally analyzed as sentences with missing verbs, hence should be parsed as in (29a,b). But in these parses the syntactic relation between the object remnants and their correlates is the same as in (24a,b).[10]

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[9] The issue arises because it has been observed that Gapping in English imposes some sort of isomorphism on the coordinates. See Hankamer (1971), Stillings (1975), and Hudson (1976) for discussion. The data presented below suggest that German is more permissive in this respect than English.

[10] As a referee for *The Journal of Comparative Germanic Linguistics* points out, (24a,b) also presuppose that a subject Gap and its antecedent need not be in parallel positions. In both cases, the Gapped subject precedes the verb whereas its antecedent follows the verb. This assumption is not crucial, however, for (24a,b) could be replaced with (ia,b), where the remnants are initial and the subject Gaps and their antecedents are in parallel syntactic positions.

(i)   a.   [Äpfel ißt der Hans drei] und [zwei Bananen {ißt der Hans}]
       b.   [von den Sängern kennt er alle] und [viele von den Musikern {kennt er}]

The referee further points out that, if these parses are assumed to be possible, we expect that (28a) stays grammatical if *der Peter* and *zwei Bananen* are inverted, and that (28b)

(28) a. Äpfel ißt der Hans drei   und der Peter zwei Bananen.

apples eats the Hans three and the Peter two bananas

'Hans eats three apples and Peter two bananas.'

b. Von den Sängern kennt er alle und sie viele von den Musikern.

of the singers   knows he all and she many of the musicians

'He knows all of the singers and many of the musicians.'

(29) a. [Äpfel ißt der Hans drei] und [der Peter {ißt} zwei Bananen]

b. [von den Sängern kennt er alle] und [sie {kennt} viele von den Musikern]

I conclude that there is some independent evidence to the effect that Gapping may
apply in the way it is assumed to apply in the parses given in (24). The Gapping analysis
is able to correctly tell apart the grammatical nominal odd coordinations in (6) and (10)
from the ungrammatical ones in (15) and (17). More precisely, it is able to do so under the
assumption that there is no asymmetric extraction from noun phrase coordinations.

4.3.4 <u>Some Good Predictions</u>

Let me show that the Gapping analysis makes some more correct predictions which
in the asymmetric extraction analysis fall out only with the help of additional stipulations.

To begin, the asymmetric extraction analysis must be supplemented with the
assumption that even though the Coordinate Structure Constraint is violable in certain
cases, asymmetric extraction can only originate in first coordinates. This assumption is

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stays grammatical if *sie* and *viele von den Musikern* are inverted. Judgments appear to be
compatible with this expectation.

necessary to rule out (31a,b) below which are potential parses for the ungrammatical odd coordinations in (30a,b).

(30) a. * Bananen ißt   der Hans drei   Äpfel   und zwei

          bananas eats the Hans three apples and two

    b. * Von den Sängern kennt er viele von den Musikern und alle.

          of   the   singers knows he many of the musicians and all

(31) a.   Bananen$_1$ ißt der Hans [[$_{NP}$ drei Äpfel] und [$_{NP}$ zwei t$_1$]]

    b.   [von den Sängern]$_1$ kennt er [[$_{NP}$ viele von den Musikern] und [$_{NP}$ alle t$_1$]]

On the other hand, (31a,b) are expected to be impossible in the Gapping analysis given that there the Coordinate Structure Constraint is not considered violable to begin with. Since no other parses for (30a,b) suggest themselves, the Gapping analysis correctly predicts that these cases are ungrammatical.

      The Gapping analysis also accounts for the grammaticality of the odd coordinations in (32) below. These examples are like the ungrammatical (15a,b) except that in each case, the word that is final in (15) now appears to the immediate left of the coordinator instead. Notice that these examples accord with the rule of independence. As shown by (14) above, the maximal strings preceding the coordinator form grammatical sentences in isolation. Hence there is presumably no reason to consider the parses in (33) any less well-formed than the ones in (27) above.

(32) a.   Äpfel   wird der Hans drei essen und zwei Bananen.

          apples will the Hans three eat   and two bananas

          'Hans will eat three apples and two bananas.'

    b.   Äpfel   dost der Hans drei ein und zwei Bananen.

           apples cans the Hans three in and two Bananas

           'Hans cans three apples and two bananas.'

(33) a.   [Äpfel wird der Hans drei essen] und [{der Hans wird} zwei Bananen {essen}]

       b.   [Äpfel dost der Hans drei ein] und [{der Hans dost} zwei Bananen {ein}]

By contrast, the asymmetric extraction analysis by itself appears to be unable to derive the examples in (32). Perhaps, however, it could be coupled with another process to form (32a,b). It has been suggested in the literature that there is a process of 'conjunct postposing' by which a coordinator together with a second coordinate may undergo extraposition.[11] If this is accepted and if the coordinates in (32) are taken to be noun phrases, then (32a,b) may perhaps be derived from (15a,b) above by way of conjunct postposing.

What needs to be explained under this account is of course why conjunct postposing rescues the ungrammatical sentences in (15a,b). In view of (13a,b) above, it must be explained why conjunct postposing is obligatory just in case some part of the first coordinate has been asymmetrically extracted. There do not seem to be independent reasons for postulating such a complex condition in the grammar of German.

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[11] The term 'conjunct postposing' is taken from Hudson (1976). More recently, such an operation has been assumed for English in Munn (1993) and Zoerner (1995). These authors do not discuss whether the examples they present could be due to Gapping. This is done for English and Dutch in Neijt (1979), who concludes that there is no evidence for conjunct postposing. Höhle (1983) and Wunderlich (1988) remain inconclusive as to whether conjunct postposing exists in German.

4.4 <u>Asymmetric Extraction from Verb Phrases?</u>

If the arguments made in the previous section are correct then there are good reasons for believing that asymmetric extraction from noun phrases is impossible. This makes Heycock and Kroch's (1994) analysis of verbal odd coordinations particularly interesting. Recall that in their analysis, verbal odd coordinations are due to asymmetric extraction from non-finite verb phrase coordinations. For example, (34a) below, which repeats (1), is parsed as in (35a), which repeats (2).

(34) a. Die Suppe wird der Hans essen und sich hinlegen.

      the soup   will the Hans eat   and   self down-lie

      'Hans will eat the soup and lie down.'

    b. Die Suppe hat der Hans gegessen und sich hingelegt.

      the soup   has the Hans eaten   and   self down-lain

      'Hans ate the soup and lay down.'

    c. Die Suppe wünscht der Hans zu essen und sich hinzulegen.

      the soup wishes   the Hans to eat   and self down-to-lie

      'Hans wishes to eat the soup and to lie down.'

(35) a. [die Suppe]$_1$ wird der Hans [[$_{VP}$ t$_1$ essen] und [$_{VP}$ sich hinlegen]]

    b. [die Suppe]$_1$ hat der Hans [[$_{VP}$ t$_1$ gegessen] und [$_{VP}$ sich hingelegt]]

    c. [die Suppe]$_1$ wünscht der Hans [[$_{VP}$ t$_1$ zu essen] und [$_{VP}$ sich hinzulegen]]

The non-finite verb phrases in (34a) are headed by the bare infinitives *essen* and *hinlegen*. Besides bare infinitives, two other forms of non-finite verbs occur in German, namely participles like *gegessen* or *hingelegt* and *zu*-infinitives like *zu essen* or *hinzulegen*. In (34b,c) it is shown that both kinds can head verb phrases appearing in verbal odd

coordinations. It is natural to apply Heycock and Kroch's analysis to these cases by assigning them the parses in (35b,c).

4.4.1 <u>Gapping is an Option</u>

If the Gapping analysis of nominal odd coordinations is accepted, it is a plausible assumption that the Gapping parses of (34a-c) given in (36a-c) are also well-formed.

(36) a.   [die Suppe wird der Hans essen] und [{der Hans wird} sich hinlegen]

b.   [die Suppe hat der Hans gegessen] und [{der Hans hat} sich hingelegt]

c.   [die Suppe wünscht der Hans zu essen] und [{der Hans wünscht} sich hinzulegen]

These parses can be further motivated. The evidence is similar to the evidence presented above in support of the Gapping analysis of nominal odd coordinations. Consider the examples in (37).

(37) a.   Entweder der Hans wird die Suppe essen oder sich hinlegen.
           either   the Hans will the soup   eat   or self down-lie
           'Either Hans will eat the soup or lie down.'

b.   Entweder der Hans hat die Suppe gegessen oder sich hingelegt.
           either   the Hans has the soup   eaten   or self down-lain
           'Either Hans ate the soup or lay down.'

c.   Entweder der Hans wünscht die Suppe zu essen oder sich hinzulegen.
           either   the Hans wishes the soup   to eat   or self down-to-lie
           'Either Hans wishes to eat the soup or to lie down.'

Assuming that *entweder* marks the left edge of the first coordinate, (37a-c) suggest that Gapping may delete a verb and a subject, leaving behind a bare verb phrase remnant. The resulting parses are given in (38a-c).

(38) a.   entweder [der Hans wird die Suppe essen] oder [{der Hans wird} sich hinlegen]

     b.   entweder [der Hans hat die Suppe gegessen] oder [{der Hans hat} sich hingelegt]

     c.   entweder [der Hans wünscht die Suppe zu essen] oder [{der Hans wünscht} sich hinzulegen]

Also, (39a-c) below demonstrate that the lack of structural isomorphism between the coordinates found in (36a-c) does not keep Gapping from applying. (39a-c) differ from (34a-c) merely in that they host overt subjects after the coordinator. Given that the second coordinates are most naturally considered reduced sentences, they are to be parsed as in (40a-c). But the coordinates in (40a-c) are no more isomorphic than the coordinates in (36a-c). It hence appears that nothing seems to speak against the Gapping parses (36).

(39) a.   Die Suppe wird der Hans essen und der Peter sich hinlegen.
         the soup   will   the Hans eat   and the Peter self   down-lie
         'Hans will eat the soup and Peter will lie down.'

     b.   Die Suppe hat der Hans gegessen und der Peter sich hingelegt.
         the soup has the Hans eaten   and the Peter self   down-lain
         'Hans ate the soup and Peter lay down.'

     c.   Die Suppe wünscht der Hans zu essen und der Peter sich hinzulegen.
         the soup   wishes   the Hans to   eat   and the Peter self down-to-lie
         'Hans wishes to eat the soup and Peter wishes to lie down.'

(40) a.   [die Suppe wird der Hans essen] und [der Peter {wird} sich hinlegen]

     b.   [die Suppe hat der Hans gegessen] und [der Peter {hat} sich hingelegt]

     c.   [die Suppe wünscht der Hans zu essen] und [der Peter {wünscht} sich hinzulegen]

Heycock and Kroch (1994) do not take the Gapping analysis into consideration. But its existence raises the question whether the asymmetric extraction analysis is really viable. This question is addressed in the following section.

4.4.2 Asymmetric Extraction is not an Option

There is in fact evidence against asymmetric extraction from verb phrases. The relevant data are analogous to the data presented in section 4.2 to argue against asymmetric extraction from noun phrases. To begin, the asymmetric extraction analysis leads to the incorrect expectation that the verbal odd coordinations in (41a-c) are grammatical. In the asymmetric extraction analysis, the parses in (42a-c) must be ruled out by stipulation. In structural terms, (42a-c) differ from (35a-c) only in that the coordinated verb phrases are embedded under an additional non-finite verb that appears sentence finally.

(41) a.?? Die Suppe hat der Hans essen und sich hinlegen   sollen.

         the soup   has the Hans eat   and self   down-lie should

     b.?? Die Suppe wird der Hans gegessen und sich hingelegt   haben.

         the soup   will the Hans eaten   and self down-lain have

     c.* Die Suppe soll   der Hans zu essen und sich hinzulegen   versuchen.

         the soup   should the Hans to eat   and self   down-to-lie   try

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(42) a. [die Suppe]$_1$ hat der Hans [[$_{VP}$ t$_1$ essen] und [$_{VP}$ sich hinlegen]] sollen

b. [die Suppe]$_1$ wird der Hans [[$_{VP}$ t$_1$ gegessen] und [$_{VP}$ sich hingelegt]] haben.

c. [die Suppe]$_1$ soll der Hans [[$_{VP}$ t$_1$ zu essen] und [$_{VP}$ sich hinzulegen]] versuchen.

The restriction at play in (42) must in fact be a restriction on asymmetric object extraction. First, the putative even counterparts of (41a-c) given in (43a-c) are grammatical. Hence there is nothing wrong with the D-structures postulated in (42). Second, as shown in (44a-c), (41a-c) become grammatical if the coordinator together with the putative second coordinate is left out. Thus (42a-c) do not violate any general constraint on object extraction.

(43) a. Der Hans hat die Suppe essen und sich hinlegen sollen.
     the Hans has the soup   eat   and self down-lie should
     'Hans had to eat the soup and lie down.'

   b. Der Hans wird die Suppe gegessen und sich hingelegt haben.
     the Hans will the soup   eaten   and self   down-lain have
     'Hans must have eaten the soup and lain down.'

   c. Der Hans soll   die Suppe zu essen und sich hinzulegen   versuchen.
     the Hans should the soup   to eat   and self   down-to-lie   try
     'Hans should try to eat the soup and lie down.'

(44) a. Die Suppe hat der Hans essen sollen.
     the soup has the Hans eat   should
     'Hans had to eat the soup.'

b. Die Suppe wird der Hans gegessen haben.

the soup   will the Hans eaten   have

'Hans must have eaten the soup.'

c. Die Suppe soll   der Hans zu essen versuchen.

the soup   should the Hans to eat   try

'Hans should try to eat the soup.'

By contrast, the Gapping analysis interprets (41a-c) straightforwardly. (45a-c) below show that (41a-c) instantiate the rule of independence: In each case, the string preceding *und* fails to form a grammatical sentence in isolation. The comparison with (44a-c) also reveals why this is so. In each case in (45a-c), the finite verb lacks a non-finite verbal argument. The Gapping analysis relates the data in (45) and (41) by banning asymmetric extraction. In that case, (45a-c) must be the first coordinates of (41a-c). We may then assume that the ungrammaticality of the former spreads to the latter.[12]

(45) a. * Die Suppe hat der Hans essen.

the soup   has the Hans eat

b. * Die Suppe wird der Hans gegessen.

the soup   will the Hans eaten

c. * Die Suppe soll   der Hans zu essen.

the soup   should the Hans to eat

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[12] Given the slight contrast between (41a,b) and (45a,b), the latter assumption must of course be weakened. It is not always the case that the ungrammaticality of a first coordinate spreads fully to the coordination as a whole. This complication is addressed in the appendix.

There is another kind of example that undermines the asymmetric extraction analysis of verbal odd coordinations. Among the German verbs with strandable particles there are some like *ablehnen* 'refuse' that select *zu*-infinitives. In (46a) it is shown that a final particle can give rise to an ungrammatical verbal odd coordination. Under the asymmetric extraction analysis, there is again no independently motivated way to exclude the parse in (46b).

(46) a. * Die Suppe lehnt der Hans zu essen und sich hinzulegen ab.

           the soup   turns the Hans to eat   and self down-to-lie down

     b. [die Suppe]$_1$ lehnt der Hans [[$_{VP}$ t$_1$ zu essen] und [$_{VP}$ sich hinzulegen]] ab

To repeat the refrain, this is so because (47a,b) below are both grammatical. The subject initial even coordination in (47a) shows that there is nothing wrong with the D-structure postulated in (46b). (47b) moreover shows that object extraction is not generally excluded in cases with *zu*-infinitives and final particles.

(47) a. Der Hans lehnt die Suppe zu essen und sich hinzulegen   ab.

           the Hans turns the soup   to eat   and self down-to-lie down

           'Hans refuses to eat the soup and lie down.'

     b. Die Suppe lehnt der Hans zu essen ab.

           the soup turns the Hans to eat   down

           'Hans refuses to eat the soup.'

On the other hand, (48) below shows that (46a) again instantiates the rule of independence: The first coordinate of (46a) is ungrammatical given that the verb lacks the obligatory particle *ab*.

(48)　　*　Die Suppe lehnt der　Hans zu essen.

　　　　　　the soup　turns the Hans　to　eat

By banning asymmetric extraction, the Gapping analysis relates (48) above and (46a). It forces (48) to be the first coordinate of (46a). Again, the ungrammaticality of the former is expected to spread to the latter.

　　　I conclude by pointing to one final advantage of the Gapping analysis over the asymmetric extraction analysis. We have seen above that the asymmetric extraction analysis must assume an ad hoc constraint against asymmetric extraction from second coordinates in nominal odd coordinations. Verbal odd coordinations give rise to an analogous conclusion. Without a ban on asymmetric extraction from second coordinates, (50) would be well-formed parses for the ungrammatical cases in (49). No such stipulation is necessary in the Gapping analysis, where the Coordinate Structure Constraint is not considered violable to begin with.

(49)　a. *　Die Suppe wird der Peter sich　hinlegen　und essen.

　　　　　　the soup　will　the Peter self　down-lie　and　eat

　　　b. *　Die Suppe hat der Peter sich hingelegt　und　gegessen.

　　　　　　the soup　has the Peter self　down-lain and eaten

　　　c. *　Die Suppe wünscht der Peter　sich　hinzulegen　und zu essen.

　　　　　　the soup　wishes　　the Peter　self　down-to-lie　and to eat

(50)　a.　　[die Suppe]$_1$ wird der Peter [[$_{VP}$ sich hinlegen] und [$_{VP}$ t$_1$ essen]]

　　　b.　　[die Suppe]$_1$ hat der Peter [[$_{VP}$ sich hingelegt] und [$_{VP}$ t$_1$ gegessen]]

　　　c.　　[die Suppe]$_1$ wünscht der Peter [[$_{VP}$ sich hinzulegen] und [$_{VP}$ t$_1$ zu essen]]

To summarize, it appears that the data presented by Heycock and Kroch (1994) to argue for asymmetric extraction from non-finite verb phrases can also be analyzed as arising from Gapping. The asymmetric extraction analysis is moreover unable to derive the rule of independence as exemplified in (41) and (46a). If asymmetric extraction is assumed to be possible in principle, then the ungrammaticality of these cases cannot be explained. In the Gapping analysis, on the other hand, the rule of independence follows naturally.

4.5 Problems and Prospects

While the Gapping analysis as presented above correctly derives the rule of independence, there are also some data which are beyond its reach. The verbal odd coordination in (51a) is a case in point.

(51) a.   Welchen Hund hat sie gefüttert und ihn   geschlagen?
          which   dog   has she fed   and it   beaten
          'Which dog did she feed and beat it?'
      b.?? Welchen Hund hat sie gefüttert und sie hat ihn geschlagen?
           which   dog   has she fed   and she has it beaten
          'Which dog did she feed and she beat it?'

In the Gapping analysis assumed above, (51a) is derived from the sentence coordination in (51b) below by deleting *sie hat*. Unlike (51a), however, the sentence in (51b) is ungrammatical. Presumably, this is so because a matrix question is coordinated with a matrix declarative sentence. The question is then why (51a) does not show the same ungrammaticality.

There are at least two kinds of conceivable answers which preserve the idea that odd coordinations are due to Gapping. First, one may give up the view that Gapping is a

process of deletion. Arguments against a deletion analysis of Gapping are in fact offered in the literature and alternatives have been proposed (for example in Hudson 1976, Stump 1978, and Johnson 1996). If Gapping is not deletion, then a Gapping example precedes its putative even source may not have isomorphic syntactic structures. The contrast in (51) may then conceivably follow from a structural difference between the two sentences. A discussion of what the proper analysis of Gapping might be is beyond the scope of the present study, however. Future research will have to examine whether the contrast in (51) can be derived from an independently motivated non-deletion analysis of Gapping.

Another conceivable account of (51a) emerges when the example in (52) below is considered. (52) is like the even sentence coordination (51b) except that it lacks an overt subject after the coordinator, and like (51a) except that the finite auxiliary is repeated after the coordinator. Since (52) is grammatical, it might now be considered a potential Gapping source for (51a).

(52) Welchen Hund hat sie gefüttert und hat ihn geschlagen?

which   dog   has she fed   and has it   beaten

'Which dog did she feed and beat it?'

In the literature, odd coordinations like (52), in which a finite main clause minus a subject follows the coordinator, are sometimes referred to as 'SGF' coordinations.[13] One characteristic property of SGF coordinations is that a complete main clause precedes the

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[13] The term 'SGF' originates in Wunderlich (1988), where it abbreviates 'Subject Gaps in Finite sentences'. Adopting a standard view, I take it that Gapping always eliminates the finite verb and hence that SGF coordinations are not themselves the result of Gapping. For discussion of SGF coordinations, see Hankamer (1973), Höhle (1983, 1990), Wunderlich (1988), Steedman (1990), Heycock and Kroch (1994), Hartmann (1994), Kathol (1995), Büring and Hartmann (1998). Zwart (1991) discusses SGF coordinations in Dutch.

coordinator. The suggestion that SGF coordinations can be Gapping sources of verbal odd coordinations is therefore compatible with the rule of independence. Moreover, verbal odd coordinations and SGF coordinations show further similarities not shared by even sentence coordinations. For example, the verbal odd coordination in (53a) below and the SGF coordination in (53b) below are both ambiguous. In one reading, the sentences say that she did not feed the dog and that she beat the dog. In this reading, *nicht* 'not' takes scope within the first coordinate. In the other reading, the sentences say that she did not both feed and beat the dog. In this reading, *nicht* scopes over both coordinates. By contrast, the even sentence coordination in (53c) is unambiguous in that negation scope is confined to the first coordinate.

(53) a.   Den Hund hat sie   nicht gefüttert und ihn geschlagen.
           the dog   has she   not   fed   and it beaten
           'She did not feed the dog and beat it.'

      b.   Den Hund hat sie nicht gefüttert und hat ihn geschlagen.
           the dog   has she not   fed   and has it beaten
           'She did not feed the dog and beat it.'

      c.   Den Hund hat sie nicht gefüttert und sie hat ihn geschlagen.
           the dog   has she not   fed   and she has it beaten
           'She did not feed the dog and she beat it.'

A similar triple of examples is given in (54a-c), where the first coordinates host the indefinite subject *einer* 'someone'. For (54a,b) to be true, there must be someone who both fed and beat the dog. By contrast, the even sentence coordination (54c), where the indefinite is repeated after the coordinator, is true whenever the dog has been both fed and beaten, whether or not this was done by the same person.

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(54) a. Den Hund hat einer   gefüttert und ihn geschlagen.

the dog   has someone fed   and it beaten

'Someone fed the dog and beat it.'

b. Den Hund hat einer   gefüttert und   hat ihn geschlagen.

the dog   has someone fed   and has it   beaten

'Someone fed the dog and beat it.'

c. Den Hund hat einer   gefüttert und einer   hat ihn geschlagen.

the dog   has someone fed   and someone has it   beaten

'Someone fed the dog and someone beat it.'

These observations again suggest that even sentence coordinations cannot be the only Gapping sources of verbal odd coordinations and again point to SGF coordinations as alternative Gapping sources.[14] If this speculation is correct, then a full understanding of verbal odd coordinations presupposes a full understanding of SGF coordinations. Discussion of SGF coordinations is beyond the scope of this study, but it should be noted that the results reached above cast doubt on one kind of analysis of SGF coordinations proposed in the literature. Höhle (1990) and Heycock and Kroch (1994) suggest that in SGF coordinations, the sentence initial phrase has been asymmetrically extracted from a coordination of finite verbal projections. If the conclusions drawn above are accepted, such an analysis is of course not attractive. A detailed examination of existing analyses of SGF coordinations in the light of the present results is a topic for future research.

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[14] The examples in (54) introduce an additional complication. Since (54a) does not have the reading that (54c) has, under the deletion analysis of Gapping it must be concluded that Gapping cannot derive (54a) from (54c). It is an open question why Gapping should be restricted in this way. I must leave this issue unresolved. See Höhle (1991) and Wilder (1994) for some relevant discussion.

4.6 <u>Some Loose Ends: Right Node Raising and Constraints on Gapping</u>

The above discussion has suppressed two complications relating to the rule of independence. First, in deriving the rule of independence, I have assumed that a grammatical sentence coordination must host a grammatical first coordinate. At least since Postal (1974), however, it has been known that this assumption is not generally justified. Second, all the ungrammatical odd coordinations discussed above instantiate the rule of independence. However, there are ungrammatical odd coordinations (expected to be grammatical in the asymmetric extraction analysis) that have grammatical sentences preceding the coordinator. Let me address these complications in turn.

The example in (55) together with the ungrammatical (56a) below shows that a grammatical sentence coordination need not always have a first coordinate that is grammatical in isolation. (56b) moreover shows that (56a) is ungrammatical because the verbal element *lehnt* lacks the obligatory particle *ab*.

(55) Der Hans lehnt   die Suppe zu essen und der Peter lehnt sich hinzulegen ab.
       the Hans turns the soup   to eat   and the Peter turns self   down-to-lie down
       'Hans refuses to eat the soup and Peter refuses to lie down.'

(56) a. * Der Hans lehnt die Suppe zu essen.
            the Hans turns the soup   to eat
       b.   Der Hans lehnt die Suppe zu essen ab.
            the Hans turns the soup   to eat   down
            'Hans refuses to eat the soup.'

It appears that the final occurrence of *ab* in (55) is somehow associated not just with the second coordinate, but also with the first. Postal (1974) demonstrates that it is in fact

common for material at the right periphery of a sentence coordination to associate with both coordinates. We have already encountered this phenomenon, which Postal refers to as 'Right Node Raising', in the discussion of unbalanced disjunctions in chapter 3. I did not adopt a particular analysis of Right Node Raising there, and it is again irrelevant for the present purposes what the best analysis might be. However, for ease of exposition, let me assume that the association of material at the right periphery with both coordinates is due to 'Left Deletion', another process of deletion under identity. (55) can then be assigned the parse in (57) where the curly brackets to the left of *und* are the result of Left Deletion.[15]

(57) [der Hans lehnt die Suppe zu essen {ab}] und [der Peter lehnt sich hinzulegen ab]

A similar case is given in (58a), where the final verb e*ssen* 'eat' is understood to associate with both the second and the first coordinate. The sentence may be assigned the parse in (58b), where *essen* has undergone Left Deletion.

(58) a.   Äpfel wird der Hans drei   und Bananen wird er zwei essen.
            apples will the Hans three and bananas will he two eat
            'Hans will eat three apples and two bananas.'
      b.   [Äpfel wird der Hans drei {essen}] und [Bananen wird er zwei essen]

What is of interest now is that Left Deletion and Gapping may cooccur (see, for example, Wunderlich 1988). This is demonstrated in (59a) below, which is like (55) except that the second occurrence of *lehnt* is missing. We may take (59a) to have the

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[15] The term 'Left Deletion' is used in e.g. Wunderlich (1988) and Kathol (1995).

parse in (59b), where the second pair of curly brackets is due to Gapping, and the first to Left Deletion.

(59) a.   Der Hans lehnt die Suppe zu essen und der Peter sich hinzulegen ab.

          the Hans turns the soup   to eat   and the Peter self   down-to-lie down

          'Hans refuses to eat the soup and Peter to lie down.'

      b.   [der Hans lehnt die Suppe zu essen {ab}] und [der Peter {lehnt} sich

          hinzulegen ab]

Similarly, (60a) below is like (58a) except that the subject and the finite verb are missing in the second coordinate. The sentence may be assigned the parse in (60b).

(60) a.   Äpfel wird der Hans drei   und Bananen zwei essen.

          apples will the Hans three and bananas two eat

          'Hans will eat three apples and two bananas.'

      b.   [Äpfel wird der Hans drei {essen}] und [Bananen {wird der Hans} zwei essen]

Notice now that since Left Deletion may cooccur with Gapping, the Gapping analysis of odd coordinations by itself actually does not quite derive the rule of independence. For example, in the above discussion of (46a), repeated here as (61a), only the Gapping parse in (61b) with the incomplete first coordinate was considered. But in view of (59b) and (47b) above, (61a) might conceivably be parsed as in (61c). Similarly, in the analysis of (15a), repeated below as (62a), we need to consider not only the parse in (62b) with the incomplete first coordinate, but also the one in (62c).

(61) a. * Die Suppe lehnt der Hans zu essen und sich hinzulegen ab.

          the soup   turns the Hans to eat   and self down-to-lie down

b. [die Suppe lehnt der Hans zu essen] und [{der Hans lehnt} sich hinzulegen ab]

c. [die Suppe lehnt der Hans zu essen {ab}] und [{der Hans lehnt} sich hinzulegen ab]

(62) a. * Äpfel wird der Hans drei   und zwei Bananen essen.

apples will the Hans three and two bananas eat

b. [Äpfel wird der Hans drei] und [{der Hans wird} zwei Bananen essen]

c. [Äpfel wird der Hans drei {essen}] und [{der Hans wird} zwei Bananen essen]

Naturally, in the Gapping analysis of verbal and nominal odd coordinations, it must be concluded that Left Deletion cannot apply as postulated in (61c) and (62c). There is in fact independent support for this conclusion. (63a) and (63b) below are like (61a) and (62a) except that an overt subject and an overt finite verb have been inserted after the coordinator. The ungrammaticality of (63a) and (63b) shows that Left Deletion cannot apply in these cases. Therefore, it is indeed expected that Left Deletion cannot apply in (61a) and (62a), either.

(63) a. * Die Suppe lehnt der Hans zu essen und er lehnt sich hinzulegen ab.

the soup   turns the Hans to eat   and he turns self down-to-lie down

b. * Äpfel wird der Hans drei   und er wird zwei Bananen essen.

apples will the Hans three and he will two bananas eat

On the other hand, it also appears that in some odd coordinations, Left Deletion is not strictly excluded. In the present view, the marginal acceptability of (41a,b) above, repeated here as (64a,b) must be credited to the marginal availability of the Left Deletion parses in (65a,b).

(64) a.?? Die Suppe hat der Hans essen und sich hinlegen   sollen.

          the soup   has the Hans eat   and self   down-lie should

      b.?? Die Suppe wird der Hans gegessen und sich hingelegt   haben.

          the soup   will the Hans eaten   and self down-lain have

(65) a.   [die Suppe hat der Hans essen {sollen}] und [{der Hans hat} sich hinlegen

            sollen]

      b.   [die Suppe wird der Hans gegessen {haben}] und [{der Hans wird} sich

              hingelegt haben]

Even though the judgments are subtle, it appears that this conclusion is also independently
supported. (66a,b) below are like (67a,b) above except that overt subjects and finite verbs
have been added after the coordinator. As indicated, (66a,b) seem slightly better than
(63a,b). It is then correctly predicted that (64a,b) are not as bad as (61a) and (62a).[16]

(66) a.?? Die Suppe hat der Hans essen und er hat sich hinlegen   sollen.

          the soup   has the Hans eat   and he has self down-lie should

      b.?? Die Suppe wird der Hans gegessen und er wird sich hingelegt   haben.

          the soup   will the Hans eaten   and he will self   down-lain have

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[16] I think the judgments in (63) and (66) do not change significantly if the subjects
after the coordinator are omitted. The argument made here is thus compatible with the
suggestion in section 4 that SGF coordinations can be the sources of odd coordinations.
The judgments in (63) and (66) also do not change significantly if the phrases *sich
hin(zu)legen*, *sich hingelegt* and *zwei Bananen* change places with the subject *er*. The
argument made here thus does not depend on the particular word orders assumed in the
Gapping parses in (61), (62), and (65). I also note that arguments analogous to the ones
advanced here support the assumption that Left Deletion is excluded in the ungrammatical
odd coordinations in (15b), (17), and (41c) above.

I conclude that the rule of independence is partly the result of an independently attested restriction on Left Deletion. An interesting open question is what the exact nature of this constraint is. The data presented above suggest that Left Deletion only applies to coordinated sentences with parallel word orders, but a detailed investigation of this matter must be left for future research.

Let me now turn to the second complication suppressed so far. The ungrammatical odd coordinations examined so far undermine the asymmetric extraction analysis and at the same time fall under the rule of independence. However, there are also pertinent examples that do not violate the rule of independence. For example, by reasoning familiar from above, the data in (68) show that in the asymmetric extraction analysis, the verbal odd coordination (67) is wrongly predicted to be grammatical.

(67) * Die Suppe hat der Hans zu essen und sich hinzulegen vor.
         the soup   has the Hans to eat   and self   down-to-lie for

(68) a. Der Hans hat die Suppe zu essen und sich   hinzulegen vor.
         the Hans has the soup to eat   and self down-to-lie for
         'Hans plans to eat the soup and to lie down.'

   b. Die Suppe hat der Hans zu essen vor.
       the soup has the Hans to eat   for
       'Hans plans to eat the soup.'

However, as shown in (69), (67) is not an obvious violation of the rule of independence. In this case, the maximal string preceding the coordinator in (67) forms a grammatical sentence in isolation. In the Gapping analysis, the task is then to argue that (70) is ill-formed even though its first coordinate is well-formed.

(69) Die Suppe hat der Hans zu essen.

     the soup has the Hans to eat

     'Hans has to eat the soup.'

(70) [die Suppe hat der Hans zu essen] und [{der Hans hat} sich hinzulegen vor]

     The ill-formedness of (70) is in fact expected. Notice that the finite verb *hat* 'has' has a modal meaning in (69), a meaning which is impossible when *hat* cooccurs with the particle *vor*. It may therefore be suspected that the verbal Gap and its antecedent in (70) are not identical for the purposes of Gapping.

     This suspicion is confirmed if we consider the grammatical Gapping case in (71a) which is parallel to (59a) above. What is relevant here is that (71a) cannot be taken to say that Hans has to eat the soup and Peter plans to lie down. (71a) unambiguously asserts that Hans plans to eat the soup and Peter plans to lie down. This indicates that (71a) has the parse given in (71b) but lacks the one in (71c). The parse of (67) in (70) is then not expected to be well-formed, either.

(71) a. Der Hans hat die Suppe zu essen und der Peter sich   hinzulegen vor.

         the Hans has the soup   to eat   and the Peter self down-to-lie for

         'Hans plans to eat the soup and Peter to lie down.'

     b. [der Hans hat die Suppe zu essen {vor}] und [der Peter {hat} sich hinzulegen vor]

     c. [der Hans hat die Suppe zu essen] und [der Peter {hat} sich hinzulegen vor]

Moreover, given that Left Deletion cannot apply in verbal odd coordinations, (67) also does not have a parse analogous to (71b). I hence conclude that, even though (67) does

not directly violate the rule of independence, its ungrammaticality is predicted in the Gapping analysis of verbal odd coordinations.

4.7 <u>Conclusions</u>

To summarize, the existence of verbal odd coordinations does not motivate a weakening of the Coordinate Structure Constraint. Moreover, if it is weakened in the way proposed by Heycock and Kroch (1994), then the rule of independence cannot be derived. On the other hand, if the Coordinate Structure Constraint is not weakened, then the rule of independence is expected. Many verbal odd coordinations can then be taken to be derived from even sentence coordinations by Gapping. However, at least if Gapping is a process of deletion, then not all verbal odd coordinations can be analyzed in this particular way, for odd coordinations are not always semantically equivalent to their putative even gapping sources. SGF coordinations may provide alternative gapping sources for these cases. If this is accepted, then a full understanding of verbal odd coordinations presupposes a full understanding of SGF coordinations. On the other hand, the results reached here contribute to the understanding of SGF coordinations by undermining some analysis of such cases proposed in the literature, namely those that postulate asymmetric extraction.

CHAPTER 5

SILENT VERB PHRASES AS BOUND VARIABLES

5.1 <u>Introduction</u>

The subordinate clause *before Bill could* in sentence (1) below illustrates the
familiar fact that English clauses sometimes lack an overt verb phrase. The standard
conclusion drawn from such cases is that a verb phrase may under certain conditions be
unpronounced. The meaning of such a silent verb phrase evidently depends on the context
in which it appears. Hankamer and Sag (1976) more specifically claim that a silent verb
phrase is always anaphoric, picking up its meaning from an antecedent verb phrase in the
surrounding discourse. Example (1) is in accordance with this claim, as the silent verb
phrase is anaphoric to *see the cat*.

(1)   John could see the cat before Bill could.

This chapter discusses the exact nature of the anaphoric link between a silent verb
phrase and its antecedent. At least two kinds of proposals appear in the literature. In one
view, the anaphoric verb phrase is "identical" to its antecedent, but has been silenced by a
process of ellipsis. In this view, (1) has the parse sketched in (2).[1]

(2)   John could [$_{VP}$ see the cat] before Bill could [$_{VP}$ see the cat]

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[1] Different version of the ellipsis analysis are spelled out in e.g. Sag (1976), Williams
(1977), Sag and Hankamer (1984), Rooth (1992b), Fiengo and May (1994), Larson and
Segal (1995), Heim (1997), Heim and Kratzer (1998), and Fox (1998).

In the other view, a silent verb phrase is a pro-form whose lack of phonetic content is specified in the lexicon. As seems natural, the pro-form is generally assumed to be interpreted in much the way overt personal pronouns are interpreted. One particular option, explored in Rooth (1981), is to interpret the pro-form in analogy to personal pronouns with quantified antecedents.[2] Such pronouns are typically analyzed as bound variables in the sense of formal logic. A specific way of implementing this analysis, spelled out in Heim and Kratzer (1998), is illustrated in (3).

(3)   a. No man thought he was late.

       b. $[_{NP}$ no man$]\,\lambda_1[t_1$ thought he$_1$ was late$]$

The logical form in (3b) is intended to represent the reading of (3a) in which the pronoun *he* is anaphoric to the quantificational noun phrase *no man*. The latter has been moved by way of quantifier raising to a position where it c-commands the pronoun, and a lambda operator has been prefixed to its sister. This operator binds both the trace left behind by quantifier raising and the pronoun by virtue of bearing the same variable index. Standard assumptions about the semantics of indices, lambda abstraction, and quantificational noun phrases ensure that (3b) has the desired interpretation.

If silent verb phrase pro-forms are construed as bound variables as well, then sentence (1) has the logical form given in (4), where the pro-form is represented by Δ. This logical form is analogous to (3b) in a transparent way and also receives the desired interpretation under standard semantic assumptions.

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  [2] In a different framework, the analysis is briefly considered in Partee and Bach (1984), who attribute the idea to Bach (1977, 1979). Klein (1987) and Hardt (1993) analyze silent verb phrase as variables in Discourse Representation Theory (Kamp 1984, Heim 1982).

(4) $[_{VP}$ see the cat] λ_1[John could t_1 before Bill could Δ_1]

It seems hard or impossible to decide between the two views of silent verb phrases on the basis of example (1) alone.[3] If we assume that the parse in (2) is the logical form of (1) in the ellipsis analysis, then the two analyses seem to assign (1) equivalent semantic interpretations. Also, both analyses require that a silent verb phrase have an antecedent.

However, examination of a wider range of cases suggests that the bound variable analysis suffers from limitations not shared by the ellipsis analysis. One such argument can be made with cases like those in (5), which are based on examples in Chomsky (1977).

(5) a. John saw no cat and it was grey.

b. When John saw every cat, it meowed.

In neither case can the pronoun *it* be understood anaphoric to the preceding quantificational noun phrase. In particular, the former cannot be interpreted as being bound by the latter. Thus, (5a) cannot mean that no cat was both seen by John and grey, and (5b) cannot mean that every cat meowed when John saw it. These facts illustrate the well-known generalization that an English quantifier cannot take semantic scope outside its finite clause. In the framework adopted here, this restriction can be credited to a syntactic locality constraint preventing quantifier raising from crossing a finite clause boundary. Such a constraint rules out the logical forms in (6), which would otherwise derive the interpretations for (5) that we want to block.

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[3] Other analyses are of course conceivable. Specifically, since personal pronouns with quantified antecedents have been analyzed as disguised definite descriptions by Evans (1980) and others, such an analysis might also be applied to silent verb phrases. This possibility remains to be explored in future research.

(6)   a. [$_{NP}$ no cat] λ_1[John saw t_1 and it$_1$ was grey]

      b. [$_{NP}$ every cat] λ_1[when John saw t_1, it$_1$ meowed]

In view of the data in (5), it can now be argued that the bound variable analysis of silent verb phrases fails to account for cases as simple as those given in (7), for the logical forms in (8) violate the locality constraint on quantifier raising no less than the logical forms in (6) do.[4]

(7)   a. John could see the cat and Bill could, too.

      b. When John could see the cat, Bill could, too.

(8)   a. [$_{VP}$ see the cat] λ_1[John could t_1 and Bill could Δ_1, too]

      b. [$_{VP}$ see the cat] λ_1[when John could t_1, Bill could Δ_1, too]

There is another class of cases that seem beyond the reach of the bound variable analysis, and in fact any version of the pro-form analysis of silent verb phrases. This class is exemplified by (9) below (from Chao 1987) which contains a coordination of wh-interrogatives. In each coordinate, the wh-phrase originates within the verb phrase. Assuming that wh-extraction must leave a trace, (9) is not derivable in the pro-form analysis, given that a pro-form by definition lacks internal structure and hence cannot host a trace.[5]

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[4] This kind of limitation of the bound variable analysis has been pointed out in Bach and Partee (1984), and is also discussed in Rooth (1981).

[5] Rooth (1981) also presents examples of this kind as a challenge for the proform analysis of silent verb phrases. Another phenomenon standardly employed to show that silent verb phrases can have internal structure is so-called antecedent contained deletion,

(9)   I know who John likes and who Bill doesn't.

The ellipsis analysis, on the other hand, does not seem to be challenged by the examples in (7) and (9). It does not seem challenged by (7) because we need not assume that the constraints governing the syntactic relation between a variable and its binder also constrain the relation between an ellipsis target and its antecedent. And the ellipsis analysis can assign sentence (9) the parse sketched in (10), where the second wh-phrase may bind the trace contained in the elided verb phrase.

(10) I know who John [$_{VP}$ likes t] and who Bill doesn't [$_{VP}$ like t]

The evidence reviewed so far hence suggests that the most economical analysis of silent verb phrases relies on ellipsis and dispenses with bound variable pro-forms. However, the purpose of this paper is to show that there are indeed silent verb phrases with the semantics of bound variables. Evidently, the argument cannot be based on cases with quantificational antecedents, for there do not seem to be verb phrases that are quantificational in the way quantificational noun phrases are. However, Partee (1970) and Keenan (1971) have argued that personal pronouns with referential antecedents sometimes are to be construed as bound variables, too. We will see that these arguments can be extended to silent verb phrases.

Section 5.2 examines the ellipsis analysis in more detail, in particular the relation between ellipsis and deaccenting. Following recent literature, it is suggested that ellipsis is to be construed as an extreme form of deaccenting. Section 5.3 presents a first set of

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discussed in Bouton (1970), Carlson (1977), May (1985), Fiengo and may (1994), Fox (1998), Sauerland (1998), and many other places.

data that might be in conflict with this conclusion and explores two possible analyses. One of them denies the close connection between deaccenting and ellipsis. In accordance with Hardt (1993), the other concedes that silent verb phrases can be bound variables. Section 5.4 presents data that allow one to decide between the two analyses, concluding that silent bound variable verb phrases exist. Section 5.5 discusses loose ends and sets up some questions for future research.

5.2 <u>Ellipsis Identity and Deaccenting</u>

According to the ellipsis analysis stated above, an elided verb phrase is "identical" to its antecedent, suggesting that identity is a precondition for ellipsis. This proposal is in need of clarification, for what exactly does it mean for two phrases to be identical? This section reviews some possible answers, in particular one relating the theory of ellipsis to the theory of deaccenting (Tancredi 1992, Rooth 1992b, Chomsky and Lasnik 1993, Fox 1998). Semantic conditions on intonation are discussed in some detail, setting the stage for the presentation of a puzzle in section 3.

5.2.1 <u>Ellipsis Identity</u>

The ellipsis analysis in its current formulation requires that a silent verb phrase and its antecedent be identical, but fails to give an indication as to how identity is to be construed. Sentence (1) above perhaps does not call for any particular view of ellipsis identity, but more informative cases have been discussed in the literature. For example, each of the sentences in (11) hosts a silent verb phrase in the second clause, and each of these silent verb phrases has an antecedent that is at least two-ways ambiguous ((a) from Tancredi 1992, (b) based on Sag and Hankamer 1984).

(11) a. John likes flying planes because Bill does.

     b. John said everyone wasn't drunk because Bill did.

The antecedent verb phrase in (11a) hosts a noun phrase referring to either a kind of object or a kind of action. This semantic ambiguity is due to a surface syntactic ambiguity which persists at logical form. The operators *everyone* and *n't* inside the antecedent verb phrase in (11b) give rise to a scope ambiguity which is syntactically represented at logical form, but presumably invisible at surface structure.

It may seem that these cases favor some construals of ellipsis identity over others. Suppose that two verb phrases are identical for ellipsis if they dominate identical strings of lexical items. This allows for the surface structures and logical forms of the silent verb phrases and their antecedents in (11) to vary independently, thereby allowing for the sentences to be four-ways ambiguous. Alternatively, suppose that two verb phrases are identical for ellipsis only if they have identical surface structures. This predicts only two readings for (11a), but still admits four readings for (11b).

Neither of these "formal" construals of ellipsis identity derives the actual judgments on (11). Both sentences are in fact only two-ways ambiguous. Specifically, they have parallel readings in which the silent verb phrase and its antecedent receive the same interpretation, but do not have crossed readings in which these interpretations differ. This would follow if ellipsis identity were construed either as identity of logical form, as Sag (1976) and Williams (1977) propose, or more directly as identity of semantic interpretation, as considered in Sag and Hankamer (1984).

However, the data in (11) argue against formal construals of ellipsis identity only under the assumption that the observed restrictions on interpretation are to be derived from the theory of ellipsis. To complete the argument against formal construals, it would have to be shown that these restrictions are indeed tied to the fact that the final verb phrases lack phonetic content.

Let us therefore examine the examples in (12) below, which are derived from those in (11) by replacing the silent verb phrases with overt occurrences of their antecedents. These sentence indeed seem to have a wider range of readings than their reduced counterparts in (11). Thus (12a) not only has the two parallel interpretations attested in (11a), but in a suitable context can also have crossed readings saying that John likes planes because Bill likes flying or that John likes flying because Bill likes planes. Similarly, (12b) shares two parallel readings with (11b), but also allows for crossed readings in which the two operators take different relative scopes in the two verb phrases.

(12) a. John likes flying planes because Bill likes flying planes.

  b. John said everyone wasn't drunk because Bill said everyone wasn't drunk.

However, while the full counterparts of the examples in (11) may in principle allow for crossed readings, these readings depend on a particular intonation pattern. For the present purposes, it will not be necessary to describe this pattern in detail. It is sufficient to note that there must be a pitch accent somewhere within the repeated verb phrase. If the repeated verb phrase is deaccented, the crossed reading is as impossible as it is in (11).

Suppose now again that two verb phrases are identical for ellipsis if they consist of identical strings of lexical items. Then the theory of ellipsis assigns (11) the same range of logical forms as (12), including logical forms that represent crossed readings. However, the sentences in (12) seem to call for a theory which derives the absence of crossed readings from the absence of pitch accents in the repeated verb phrases. Since silent verb phrases evidently do not host pitch accents either, the same theory will also exclude the crossed readings in (11).

The effect of intonation in (12) thus suggests that restrictions on the interpretation of silent verb phrases are at least in part due to a general condition on the interpretation of deaccented material, a condition applying in particular to material that has no phonetic

content to begin with. This is in fact what has been proposed in Tancredi (1992), Rooth (1992b), Chomsky and Lasnik (1993), and Fox (1998). The remainder of this section presents a way of spelling out this proposal in greater detail. Subsection 5.2.2 explores the semantic effects of pitch accents and their absence in phonetically overt material, subsection 5.2.3 will then return to the analysis of ellipsis.

5.2.2 <u>Conditions on Deaccenting</u>

It has been known at least since Halliday (1967) that the placement of pitch accents partly determines the class of linguistic environments in which a sentence can be used felicitously. A simple illustration is the discourses in (13) and (14). As is customary, capitals are used here to mark accented words in sentences where accent placement is relevant. Under the intonation in (B) thus indicated, the discourse in (13) is felicitous, but the discourse in (14) is not. Moreover, (14) becomes felicitous if an additional accent is placed on the verb in (B).

(13)   A: John cleaned.

       B: No, BILL cleaned.

(14)   A: John cooked.

    # B: No, BILL cleaned.

It seems natural to hypothesize that (14) is infelicitous because (A) and (B) fail to stand in a particular semantic relation. Let me say (14) differs from (13) in that (A) fails to *support* (B). An analysis of these discourses must then answer the following two questions. How is the support relation to be construed? And what is the nature of the constraint requiring that (A) support (B)? This subsection addresses these questions in turn.

The construal of support I will adopt here is based on so-called alternative semantics, the framework developed in Rooth (1985).[6] Alternative semantics follows Jackendoff (1972) in the assumption that pitch accents are reflected in syntactic representations by a focus marker 'F'. It is assumed that a word can be focus marked just in case it hosts a pitch accent. Then the (B) sentence in (13) and (14) has the logical form *Bill$_F$ PAST clean*.[7]

In alternative semantics, focus marking is taken to have no effect on the proposition expressed by a sentence. However, apart from its ordinary value, every logical form is assigned a *focus value*, which does depend on focus marking. The focus value of a logical form ϕ is a set containing the ordinary value of ϕ, as well as any value resulting from replacing the denotations of focus marked constituent included in ϕ with alternative denotations of suitable types. Thus, the focus values of the logical form *Bill$_F$ PAST clean* consists of propositions of the form *that x cleaned.* Assuming that John is the only alternative to Bill, it is the set {that Bill cleaned, that John cleaned}. Similarly, the focus value of *Bill$_F$ PAST clean$_F$* consists of propositions of the form *that x Ped*. Assuming that cooking is the only alternative to cleaning, it is the set {that Bill cleaned, that John cleaned, that Bill cooked, that John cooked}.[8]

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[6] For alternative proposals, see Chomsky (1971), Jackendoff (1972), von Stechow (1981), Krifka (1991), among others.

[7] Chomsky (1971) makes clear that a pitch accent on some word can license focus marking of a complex constituent properly containing this word, rather than the word itself. However, to keep the discussion manageable, the following confines attention to focus marking of accent bearing words. Accordingly, the analysis of deaccenting arrived at below will be a simplified one. For a more complete analysis, see Schwarzschild (to appear), Sauerland (1998), and references given there.

[8] Rooth (1985) also specifies a method for deriving focus values compositionally, which applies ordinary rules of semantic composition to the individual members of focus values. Kratzer (1991) specifies a different method in which focus marked expressions are interpreted much like variables in predicted logic. Kratzer's method is sketched in section 4 below.

Alternative semantics lends itself to a straightforward construal of the support relation. Suppose, as suggested by Rooth (1992a), that an expression α *supports* an expression β just in case the ordinary value of α is a member of the focus value of β. It is apparent that this definition distinguishes (13) and (14) in the desired way. It also correctly predicts that (14) improves if an additional pitch accent licenses focus marking on *cleaned*.

However, this straightforward construal of support is known to be too restrictive in general. This is illustrated by (16) below, which modifies examples discussed in Lakoff (1971), Tancredi (1992), and Rooth (1992b). Assuming that (B) has the logical form $Bill_F$ *PAST insult her*, its focus value will contain the proposition that Bill insulted Mary and the proposition that John insulted Mary, but evidently not the proposition that John called Mary a linguist. Hence (B) is not supported under the definition proposed above, which is in conflict with the fact that (16) is acceptable.

(16)   A: John called Mary a linguist.

      B: No, BILL insulted her.

Actually, the claim that (16) is acceptable must be qualified in a way which already indicates how the current construal of support is to be revised. The discourse is in fact unacceptable if embedded in a context entailing, say, that John praises Mary by calling her a linguist. It intuitively presupposes that John insults Mary by calling her a linguist. More explicitly, it presupposes that any event of John calling Mary a linguist is also an event of John insulting Mary.

Building on Stalnaker (1972), Karttunen (1974) proposes that presuppositions can be construed in terms of an "admittance" relation between sentences and conversational contexts as follows. A sentence S *presupposes* the proposition p just in case every context that admits S entails p. Assuming that discourses, too, have admittance conditions, the

perceived presupposition of (16) indicates that the discourse is only admitted by contexts entailing that John insults Mary by calling her a linguist. If (16) is encountered in a context that does not admit it, then *accommodation* in the sense of Lewis (1979) may adjust the context by adding the presupposed proposition to it. However, a presupposition plausibly cannot be accommodated if it is incompatible with the context. This accounts for the infelicity of (16) in a context entailing that John praises Mary by calling her a linguist.

Let me define that a proposition *subsumes* another just in case any event that instantiates the first also instantiates the second. Thus the proposition that John called Mary a linguist subsumes the proposition that John insulted Mary just in case any event of John calling Mary a linguist is also an event of John insulting Mary. Support can now be redefined as a three-place relation between two expressions and a context as follows. A constituent α *supports* a constituent β in context c just in case for some member b of the focus value of β, c entails that the ordinary value of α subsumes b.

Under the standard view that any two events count as being distinct if they have distinct participants, no event of John calling Mary a linguist is also an event of someone other than John insulting Mary.[9] It follows that in (16), (A) supports (B) in a context c just in case c entails that the proposition that John called Mary a linguist subsumes the proposition that John insulted Mary. Assuming that (16) is only admitted by contexts in which (A) supports (B), its presupposition is thereby derived.

If (16) is only admitted by contexts in which (A) supports (B), then the same presumably holds for (13) and (14). Since in (13), the ordinary value of (A) is a member of the focus value of (B), and since subsumption is reflexive, (A) supports (B) in every context. Thus, as desired, no presupposition is derived for this case. In (14), the standard

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[9] That events are individuated in this way is assumed in, e.g., Zucchi (1989), Parsons (1990), Portner (1992), Kratzer (1998).

view of events ensures that (A) supports (B) in a context c just in case c entails that the proposition that John cooked subsumes the proposition that John cleaned. Assuming that no event of cooking can be an event of cleaning as well, it follows that (14) can only be admitted by a context entailing that John did not cook. However, since such a context is inconsistent with the proposition expressed by (A), it actually will not admit (14), either. The discourse is thus predicted to carry an inconsistent presupposition, and hence is correctly predicted infelicitous.

I now turn to the second question stated in the beginning of this subsection. Why is it that, in each of the discourses presented above, sentence (A) must support sentence (B)? To begin with, under the assumption that a proposition can only be subsumed by another proposition, (A) turns out to be the only potential support of (B). The residual task is thus to specify a constraint requiring that the (B) sentences be supported.

The support constraint I will adopt modifies a proposal by Schwarzschild (to appear). Schwarzschild argues that expressions in need of support can be characterized in terms of focus marking. Specifically, he proposes that an expression must be supported just in case it is not focus marked. Acknowledging the role of context, this proposal may be fleshed out as follows. For any expression β and context c, if β is not focus marked, than c admits the discourse containing β only if that discourse provides an expression α, such that α supports β in c.

Since the (B) sentences above are not themselves focus marked, this construal of the support constraint has the desired effect. However, it also requires that subsentential non-focus marked expressions be supported. This means that subsumption must be generalized so as to relate denotations other than propositions. A straightforward way of doing so, drawing on Partee and Rooth (1983) among others, can be illustrated as follows. Suppose that P and Q are properties of individuals, that is, functions from individuals to propositions. Then P *subsumes* Q just in case, for every individual x, P(x) subsumes Q(x). Thus the property of calling Mary a linguist subsumes the property of insulting Mary just

in case everyone insults Mary by calling her a linguist. It is perhaps clear how to generalize from this example to properties and relations of other logical types.

Let us now examine the non-focus marked verb phrases of the (B) sentences in (13) and (16). In both discourses, the verb phrase β of the (B) sentence has a focus value whose only member is its ordinary value, and the verb phrase α in (A) is its only potential support. Given that in (13), the two verb phrases are equivalent, α supports β in every context, which seems adequate. In (16), α supports β in a context c just in case c entails that the property of calling Mary a linguist subsumes the property of insulting Mary.

We have seen that the two properties are so related just in case everyone insults Mary by calling her a linguist. Schwarzschild's proposal thus predicts a presupposition which is stronger than the presupposition assumed above. However, it appears that (16) does not in fact carry this stronger presupposition. The discourse may well be felicitous in a context entailing that only John insults people by calling them linguists. I therefore conclude that the verb phrases of the (B) sentence in (16) need not be supported, and hence that Schwarzschild's support constraint is to be weakened.[10]

A modification of the kind needed here can be built on a proposal in Rooth (1992b). Rooth specifically discusses conditions on deaccented verb phrases. Based on data similar to (16), he argues that such a verb phrase need not be supported itself, as long as it is contained in a larger constituent that is supported. Generalizing this condition leads to the following revision of Schwarzschild's support constraint. For any expression γ and context c, if γ is not focus marked, than c admits the discourse containing γ only if that discourse provides an expression α, such that for some expression β that includes γ, α supports β in c.

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[10] Schwarzschild (to appear) in fact generalizes the support relation in a way that allows for expressions of different logical types to be relate by support. The following arguments thus do not necessarily apply to Schwarzschild's actual proposal.

This version of the support constraint straightforwardly ensures that in all the examples presented in this subsection, sentence (B) but no constituent properly included in (B) needs support.[11] This concludes the discussion of the theory of support. We can now return to the question of how ellipsis relates to deaccenting.

5.2.3 Conditions on Ellipsis

The examples in (17) below repeat those in (12) above, with capitals making the intended accents in the clauses to the right of *because* explicit. We have seen that under the intonation thus indicated, the sentences have parallel readings in which the interpretations of the two string identical verb phrases are the same, but lack crossed readings in which these interpretations differ.

(17) a. John likes flying planes because BILL likes flying planes.

     b. John said everyone wasn't drunk because BILL said everyone wasn't drunk.

It is apparent that this observation follows from the theory of support established above. In the parallel construals, the two sentences are analogous to the discourse in (13), with the clauses to the left and right of *because* corresponding to (A) and (B), respectively. Accordingly, they are correctly predicted to satisfy the support constraint in any context. In the crossed construals, by contrast, the two sentences are analogous to the discourse in (14). They are thus correctly predicted to carry inconsistent presuppositions, and hence not to be perceived, given the natural assumptions that no event of liking planes can also be an event of liking flying, and that no event of saying that someone was not drunk can also be an event of saying that no one was drunk.

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[11] Assuming that discouse initial sentences can be focus marked as a whole, the (A) sentences satisfy the support constraint vacuously.

It is also apparent that the theory of support makes correct predictions for (11), repeated in (18) below with relevant accents indicated. In particular, the crossed readings in (18) are excluded in the same way as those in (17) under the assumption that focus marking of elided material is as illicit as focus marking of deaccented material.

(18) a. John likes flying planes because BILL does.

b. John said everyone wasn't drunk because BILL did.

Notice that the theory of support excludes the crossed readings without reference to any particular construal of ellipsis identity, and in fact without assuming an identity condition on ellipsis to begin with. Following Chomsky and Lasnik (1993), one might therefore speculate that semantic conditions on ellipsis can be fully reduced to conditions on deaccenting. However, Tancredi (1992), Rooth (1992b), and Fox (1998) present cases like (19) below to demonstrate that ellipsis is indeed more restricted than deaccenting.

(19) A: John called Mary a linguist.

B: No, BILL did.

This case is derived from (16) by omitting the deaccented verb phrase in (B). The reduced sentence unambiguously asserts that Bill called Mary a linguist. In particular, it cannot be taken to say that Bill insulted Mary, indicating that ellipsis cannot have applied to *insult Mary*. Since the theory of support evidently does not derive this restriction, the question is what does.

One conceivable answer postulates a general principle of presupposition minimization which says that, if an expression has an interpretable logical form α, then the reading represented by α will not surface if the expression has another interpretable logical form β such that the presupposition introduced by α is stronger that the

presupposition introduced by β. This principle, which is similar to proposals in Tancredi (1992) and Fox (1998), accounts for the lack of ambiguity in (19) as follows. The silent verb phrase has the two interpretable logical forms *insult Mary* and *call Mary a linguist*. The theory of support ensures that the former logical form introduces a stronger presupposition than the latter. Presupposition minimization therefore correctly predicts that only the latter gives rise to a perceivable interpretation.

However, whether or not presupposition minimization can be defended as a general principle, there are cases similar to (19) which seem beyond its reach. The discourse in (20) below is analogous to examples discussed in Rooth (1992b). The pronoun in (B) can be anaphoric to either John or Bill, and neither interpretation is perceived to be associated with a presupposition.

(20)   A: John's mother scolded John.

  B: BILL's mother scolded him, too.

Presupposition minimization therefore does not exclude either of these interpretations as readings of (21) below, where the verb phrase in (B) is silent. However, the reduced (B) sentence in fact unambiguously asserts that Bill's mother scolded John.

(21)   A: John's mother scolded John.

  B: BILL's mother did, too.

Rooth (1992b) concludes from such facts that ellipsis after all is subject to an identity condition, a conclusion I will accept in the following.[12] It in fact seems that any

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[12] Fox (1998) aims to derive the contrast between (20) and (21) by a constraint much like presupposition minimization sketched above. This account in effect assumes that the presupposition of a sentece cannot be completely characterized in terms of its information

of the construals of identity considered above has the desired effect for (19) and (21). However, only the identity of strings construal avoids redundancy in the theory, as all the others exclude crossed readings also excluded by the theory of support. I will therefore assume in the following and that ellipsis identity is identity of strings of lexical items.[13]

The purpose of the remainder of this paper is to demonstrate that the theories of support and ellipsis laid out in this section are limited in ways not previously described in the literature and to provide a natural extension of the analysis of silent verb phrases. The next section begins by pointing to a contrast between ellipsis and deaccenting that is of a quite different nature than those observed above.

5.3 Silent Focus

The discourses in (23) and (24) below differ only in that in the former, but not the latter, the final verb phrase in (B) is accented. This minimal difference in intonation correlates with a contrast in acceptability. Assuming that all the pronouns refer to John, (23) is acceptable. But (24) is perceived to be infelicitous in much the way (14) above is.

(23) A: John cooked because he had to cook.

     B: And he CLEANed because he had to CLEAN.

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content. It remains to be seen whether such a notion of presupposition can be motivated independently.

[13] In view of observations made in Sag (1976) and Williams (1977), this identity condition on ellipsis must apply at logical form. For example, *John greeted every girl before Bill did* shares a reading with *John greeted every girl before Bill greeted her*. This reading can be credited to the logical form *[every girl] λ_1[John PAST [$_{VP}$ greet t_1] before Bill did [greet her$_1$]*. This case also illustrates that a trace and a pronoun are to be considered identical for ellipsis. For more discussion of imperfect identity of this sort, see Sag and Hankamer (1984) and Fiengo and May (1994).

(24) A: John cooked because he had to cook.

   # B: And he CLEANed because he had to clean.

This contrast might be expected under the present theory of support. The focus value of the (B) sentences in (23) and (24) contain propositions of the form *that John Ped because he had to Q* and *that John Ped because he had to clean*, respectively. Both discourses are predicted to be admitted only in contexts in which (A) supports (B). Under the assumption that an event of John cooking because he has to cook cannot also be an event of John cooking because he has to clean, it follows that (24) carries an inconsistent presupposition. In (23), by contrast, the focus value of (B) contains the proposition expressed by (A), hence the support constraint is correctly predicted not to impose any admittance condition on this discourse.

In the light of these data and the analysis given, consider now the example in (25) below. This discourse is just like (23) and (24) except that the final verb phrase in (B) has been omitted. It is felicitous in a reading in which the silent verb phrase is anaphoric to *cleaned*.

(25) A: John cooked because he had to cook.

   B: And he CLEANed because he had to.

This observation is a puzzle for the ellipsis analysis of silent verb phrases arrived at above. For this analysis credits the relevant reading of (25) to a silent occurrence of *clean*. We have made the natural assumption that a word can be focus marked only if it is accented. Since a silent expression cannot host a pitch accent, this assumption ensures that (24) and (25) have identical logical forms. The theory of support then incorrectly excludes the acceptable (25) as much as it does the unacceptable (24).

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I will in the following explore two potential solutions of this puzzle, which both assign an alternative logical form to (25). The first solution modifies the current ellipsis analysis, denying the close relation between ellipsis and deaccenting and relating (25) to (23). The second solution postulates that silent verb phrases can be bound proforms, relating (25) to (20). This section and the next section present these two solutions in turn.

One possible conclusion to draw from the above data is that the theories of ellipsis and focus marking assumed in the previous section are to be modified. We have assumed so far that any focus marked expression must host an accent, and hence that no silent verb phrase can host focus marking. Suppose now instead that focus marking in a silent verb phrase is well-formed just in case its presence is forced by the theory of ellipsis. Suppose moreover that the current theory of ellipsis is modified by construing ellipsis identity as identity of logical form. It then follows that an elided verb phrase can host focus marking just in case its antecedent does, and that an elided verb phrase in fact must agree in focus marking with its antecedent.

This theory of silent verb phrases and focus marking, let me call it *E*, provides a straightforward account of the discourse in (25). It assigns the (B) sentence in (25) the logical form in (26), which is also the logical form of the (B) sentence in (23). The two discourses then satisfy the support constraint in the same way.

(26) he PAST [$_{VP}$ clean$_F$] because he had to [$_{VP}$ clean$_F$]

Notice that E precludes the reduction of semantic constraints on ellipsis to semantic constraints on deaccenting. Since E allows for silent verb phrases with ambiguous antecedents to be focus marked, crossed readings in these cases are compatible with the theory of support, and are only ruled out by E itself. This might be considered a conceptual flaw that is enough to dismiss E. However, the purpose of the following is to evaluate E on the basis of empirical evidence. Building on discussion in Kratzer (1991),

the remainder of this section shows that E forces a modification in the representation of focus. The next section then discusses data which argue against E itself.

We have seen that E can account for the acceptability of (25) by assigning it the same logical form as (23). However, it appears that the (B) sentences in (23) and (25) do not in fact have the same distribution. The examples (27) and (28) below are derived from those in (23) and (25) by replacing *cooked* with *shopped*. While the discourse in (27) could be a conversation about why John did what, the discourse in (28) is unacceptable. The acceptability of (27) is correctly predicted since the focus value of (26) contains the proposition expressed by (A), but for the same reason (28) is incorrectly predicted acceptable as well.

(27)   A: John shopped because he had to cook.

B: And he CLEANed because he had to CLEAN.

(28)   A: John shopped because he had to cook.

   # B: And he CLEANed because he had to.

The contrast between (27) and (28) might be taken to argue against E. However, the discussion in Kratzer (1991) shows that E can be maintained if focus is analyzed in a particular way. Kratzer motivates her analysis of focus with slightly different ellipsis data than those presented here. However, I will postpone discussion of Kratzer's data until the final section, and here discuss Kratzer's analysis with respect to the present cases.

Kratzer proposes that focus is not represented at logical form by a single focus marker 'F', but by a family of focus markers 'F1', 'F2', etc. If focus is so represented, then the logical form is in (26) is to be replaced with either (29a), where the two focus markers are identical, or with (29b), where the two focus markers are distinct.

(29) a. he PAST [$_{VP}$ clean$_{F1}$] because he had to [$_{VP}$ clean$_{F1}$]

 b. he PAST [$_{VP}$ clean$_{F1}$] because he had to [$_{VP}$ clean$_{F2}$]

Kratzer moreover suggests that focus markers are interpreted in such a way that in the formation of focus values, the values of expressions carrying identical focus markers must be replaced with identical alternative values, whereas the values of expressions carrying distinct focus markers may also be replaced with distinct alternative values. Thus, the focus value of (29b) is the same as the focus value assumed for (26) above. But the focus value of (29a) only contains propositions of the form *that John Ped because he had to P*. If only cooking and shopping are alternatives to cleaning, this is the set {that John cleaned because he had to clean, that John cooked because he had to cook, that John shopped because he had to shop}.

Notice now that E assigns sentence (B) in (28) the logical form in (29a), where the two verb phrases in question are identical. The focus value of this logical form does not contain the proposition expressed by (A). Accordingly, (28) carries an inconsistent presupposition under the assumption that an event of John shopping because he has to cook cannot also be an event of John shopping because he has to shop. By contrast, sentence (B) in (27) can be assigned the logical form in (29b), and is hence predicted to satisfy the support constraint in the same fashion as before.

I conclude that under the theory of focus proposed in Kratzer (1991), E accounts for all the data considered in this section. As mentioned, however, E seems unsatisfactory in that it fails to relate ellipsis to deaccenting in the way suggested by the preceding section. The following section furthermore argues on empirical grounds that E is to be replaced with an alternative account.

5.4 Bound Variables

The reader may have noticed that the problematic example in (25), repeated below, is parallel to the example in (20), also repeated below. In a transparent sense, the silent verb phrase, *clean*, and *cook* in (25) correspond to the personal pronoun, *Bill*, and *John* in (20), respectively. In particular, we have seen that the silent verb phrase can be anaphoric to *clean*, just like the personal pronoun can be anaphoric to *Bill*. Adapting terminology of Ross (1967, 1969), I will in the following refer to these readings as *sloppy*.

(25)   A: John cooked because he had to cook.

        B: And he CLEANed because he had to.

(20)   A: John's mother scolded John.

        B: BILL's mother scolded him, too.

Partee (1970) discusses examples similar to (20) and proposes that in the sloppy reading, the personal pronoun is to be interpreted as a bound variable in the sense of formal logic. Partee argues that a deaccented sloppy pronoun is not referring given that it cannot be replaced with a copy of its referring antecedent without accenting this copy. In fact, (20) becomes unacceptable if the deaccented pronoun is replaced with a deaccented copy of *Bill*, just like (25) becomes unacceptable if the silent verb phrase is replaced with a deaccented copy of *clean*.[14]

Rooth (1992b) also assumes that the pronoun in cases like (20) is interpreted as a bound variable. Rooth points out that in alternative semantics, the sloppy pronoun must be bound in order to ensure that its host sentence is assigned a proper focus value. We

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[14] Moreover, even an accented occurrence of *Bill* can be added to (20) only if the final particle *too* is omitted. Partee (1970) also reports this kind of observation.

have observed above that the sloppy reading of (20) is not perceived to be associated with a presupposition, indicating that the focus value of (B) contains the proposition expressed by (A). If the sloppy pronoun were construed as referring to Bill, the focus value of (B) would only contain propositions of the form *that x's mother scolded Bill*, hence not the proposition expressed by (A). In contrast, the focus value of the logical form in (30) below, where the pronoun is bound by its antecedent, consists of propositions of the form *that x's mother scolded x,* and hence indeed contains the proposition expressed by (A).

(30) $[_{NP}$ Bill$_F]$ $\lambda_1[t_1$'s mother PAST scold him$_1]$

If the sloppy reading of the (B) sentence in (20) is credited to the logical form in (30), then the parallelism between (20) and (25) suggests that the sloppy reading of the (B) sentence in (25) is to be credited to the logical form in (31), where the silent verb phrase is a proform which is bound by its antecedent.

(31) $[_{VP}$ clean$_F]$ $\lambda_1[$he PAST t$_1$ because he had to $\Delta_1]$

The focus value of this logical form contains propositions of the form *that John Ped because he had to P*, thus is identical to the focus value of logical form in (29a) above. Accordingly, (31) accounts for the acceptability of (25) without allowing for (28) in the same way as (29a). The purpose of the remainder of this section is to defend the bound variable analysis of (25) against possible objections.

Two objections against the bound variable analysis of silent verb phrases have been raised in the introduction. To begin with, we have seen that silent verb phrases can host traces. Since proforms by definition lack internal structure, the bound variable analysis cannot accommodate such cases. However, this argument of course argues against the proform analysis only under the assumption that all silent verb phrases are analyzed in the

same way. If this assumption is not made, then the argument merely shows that not all silent verb phrases are proforms. Chao (1987) in fact assumes that silent verb phrases can be either silent proforms or derived through ellipsis. I will adopt this assumption in the following, but will return to the issue of traces in verb phrases in the final section.

Another objection against the bound variable analysis raised in the introduction is that in some cases, a silent verb phrase and its antecedent do not seem local enough to allow for variable binding. In fact, we have seen that the two may appear in utterances of different speakers. Again, this observation by itself only suggests that not all silent verb phrases are bound variable proforms. However, the argument can be strengthened by constructing cases similar to (25) in which binding locality appears violated. The example in (32) is a case in point.

(32) A: When John had to cook, he didn't want to cook.

  B: When he had to CLEAN, he didn't want to, either.

This discourse is parallel to (25) and also does not carry a presupposition in the sloppy reading in which the silent verb phrase is anaphoric to *clean*, indicating that the focus value of (B) contains the proposition expressed by (A). In the bound proform analysis, this means that (B) has the logical form in (33), whose focus value contains propositions of the form *that John did not want to P when he had to P*. In this logical form, the antecedent verb phrase has been extracted from a domain which we have made out to be an island for movement of quantificational noun phrases at logical form.

(33) $[_{VP}$ clean$_F]$ λ_1[when he had to t_1, he didn't want to Δ_1]

Examples like these might be considered a motivation for giving up the bound variable analysis of silent verb phrases in favor of E and Kratzer's analysis of focus. In

the latter analysis, sentence (B) in (32) is assigned the logical form in (34), which has the same focus value as (33) and is compatible with locality constraints on movement.

(34) when he had to [$_{VP}$ clean$_{F1}$], he didn't want to [$_{VP}$ clean$_{F1}$]

However, it can be argued that the logical form in (33) is in fact preferable to the one in (34) in that it covers variants of (32) that seem beyond the reach of (34). The discourse in (35) below is derived from (32) by omitting the second occurrences of *cook* and *want to*. The relevant observation is that (35) allows for the same sloppy reading that is attested in (32).[15]

(35) A: When John had to cook, he didn't want to.
      B: When he had to CLEAN, he didn't, either.

This is unexpected under E, for this theory does not offer a logical form of (35) that represents the reading in question. In particular, while the logical form in (36) below, which suppresses focus marking for simplicity, has the desired interpretation, it fails to provide an identical ellipsis antecedent for the silent verb phrase *want to clean* in (B).

(36) A: when he had to [$_{VP}$ cook], he didn't want to [$_{VP}$ cook]
      B: when he had to clean, he didn't [$_{VP}$ want to [$_{VP}$ clean]]

It might perhaps be suggested that ellipsis of this verb phrase is licensed because each of the words contained in it occurs previously in the discourse. However, such an account of

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[15] After completing work on this chapter, I found a similar example in Hardt (1999), who attributes it to Carl Pollard. Hardt seems to draw conclusions similar to those drawn here, but I need to leave a detailed discussion of his analysis to a future occasion.

(35) is challenged by the observation that the sloppy reading attested in (35) and (23) is absent in (37) below, which is derived from (35) by appending an overt occurrence of *cook* to sentence (A). In this discourse, sentence (B) unambiguously says that John did not want to cook when he had to clean.

(37) A: When John had to cook, he didn't want to cook.

   B: When he had to CLEAN, he didn't, either.

If it were assumed that (35) has the logical form in (36) to account for its sloppy reading, then the question would arise how to prevent (36) from also being a well-formed logical form for (37), incorrectly predicting a sloppy reading for this case as well. As far as I can see, this question does not have an answer that is independently motivated.

   In contrast, assuming that silent verb phrases can be bound proforms, and disregarding issues of locality for the moment, it can be shown that the variants of (32) in (35) and (37) behave as expected. They are again parallel to examples involving personal pronouns. It is clear that (32) is parallel to (20) in the much the way (25) is. Also, the discourses in (38) and (21), repeated below, are parallel in form to (35) and (37) in a transparent way.

(38) A: John's mother scolded him.

   B: BILL's mother did, too.

(21) A: John's mother scolded John.

   B: BILL's mother did, too.

In analogy to (35), the discourse in (38) allows for a sloppy reading in which (B) says that Bill's mother scolded Bill. In contrast, in analogy to (37) and as mentioned in the previous section, the sloppy reading is not attested in the discourse in (21).

Keenan (1971) argues that sloppy personal pronouns in examples like (38) are to be analyzed as bound variables.[16] In fact, the logical form of (38) given in (39), where both (A) and (B) host a bound variable pronoun and which represents the sloppy reading, is expected to be well-formed. The focus value of (B) again contains the proposition expressed by (A), and the verb phrase in (B) can be elided under identity of strings of lexical items with the verb phrase in (A). Moreover, it is expected that (21) lacks the sloppy reading, given that the second occurrence of *John* prevents the two verb phrase from being identical for ellipsis.

(39)   A: [$_{NP}$ John] λ_2[t_2's mother PAST [$_{VP}$ scold him$_2$]]

        B: [$_{NP}$ Bill$_F$] λ_1[t_1's mother PAST [$_{VP}$ scold him$_1$]]

If the logical form in (39) is assumed to account for the sloppy reading of (38), then by analogy, the sloppy reading of (35) is to be credited to the logical form in (40). Again, the focus value of (B) contains the proposition expressed by (A) and the final verb phrase in (B), which itself hosts a verb phrase proform, is identical in lexical content to the final verb phrase in (B). Notice that (40) explicitly assumes that silent verb phrases have two possible analyses, they can be either bound proforms or derived through ellipsis. Also, just like the absence of the sloppy reading in (21), the absence of a sloppy reading in (37) can be credited to the lack of identity for ellipsis.

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[16] This analysis has become standard in the semantic literature (see Partee 1970, Sag 1976, Williams 1977, Reinhart 183, Partee and Bach 1984, Rooth 1992b, Larson and Segal 1995, Heim 1997, Tomioka 1997, Heim and Kratzer 1998, among others.)

(40) A: [$_{VP}$ cook] λ_2[when he had to t_1, he didn't [$_{VP}$ want to Δ_2]]

B: [$_{VP}$ clean$_F$] λ_1[when he had to t_1, he didn't [$_{VP}$ want to Δ_1]]

What remains to be discussed is the violation of locality by verb phrase binding in logical forms like (40). Given the parallelism between personal pronouns and silent verb phrases observed so far, it might be expected that similar issues of locality arise in cases of noun phrase binding. In fact, Dalrymple, Pereira, and Shieber (1991), Hardt (1993), and Tomioka (1997) discuss examples smilar to (41), which allows for a sloppy reading in which (B) says that we congratulate Bill if Bill wins. If sloppy personal pronouns are to be analyzed as bound variables, then this example receives the logical form in (42), which violates locality of movement at logical form as much as (40) does.

(41) A: When John wins, we congratulate him.

B: When BILL wins, we do, too.

(42) A: John λ_2[when t_2 wins, we PAST [$_{VP}$ congratulate him$_2$]]

B: Bill$_F$ λ_1[when t_1 wins, we PAST [$_{VP}$ congratulate him$_1$]]

The problem of locality thus does not undermine the bound variable analysis of silent verb phrases any more than it undermines the bound variable analysis of sloppy personal pronouns. Accordingly, any potential adjustment in the analysis of sloppy personal pronouns will presumably carry over to the analysis of sloppy silent verb phrases as well.[17]

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[17] Tomioka (1997) argues that sloppy pronouns in cases like (41) are to be analyzed in the same way as donkey pronouns, that is, pronouns anaphoric to indefinite noun phrases, rather than genuine quantificational noun phrases. This accounts for the well-formedness of (41), given that in *when a girl wins, we congratulate her*, the pronoun can be anaphoric

5.5 Conclusions and Loose Ends

Let me summarize the main argument made in this chapter. It appears that to some extent at least, semantic restrictions on ellipsis are to be derived from the theory of support, the theory which accounts for the distribution of deaccented material in general, rather than silent material in particular. Residual differences between deaccenting and ellipsis can be credited to a formal identity condition on ellipsis. However, while this analysis of silent verb phrases is economical, it is shown to be insufficient by certain examples in which a silent verb phrase cannot be replaced with a deaccented copy of its antecedent. These examples can be accounted for by assuming that a silent verb phrase can host focus marking as long as its antecedent does, thereby denying the theoretical connection between ellipsis and deaccenting. However, additional data show that the silent verb phrases in question are analogous to personal pronouns standardly analyzed as bound variables, suggesting that these silent verb phrases too are to be so analyzed.

I conclude this paper with the discussion of some issues postponed or disregarded above. To begin, let me briefly discuss kind of data discussed in Kratzer (1991) to motivate the theory of focus introduced in section 5.4. Kratzer explores examples similar to (43) below, in which the quantificational adverb *only* associates with an accented verb phrase, which in turn serves as the antecedent of a silent verb phrase.

(43)   John only CLEANed because he had to.

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to the indefinite. Tomioka moreover argues that binding of donkey pronouns is subject to certain syntactic conditions, which indeed are also attested with sloppy pronouns.

Assuming that *only* raises at logical form to combine with its host sentence, assuming that focus is marked with 'F', and assuming the theory E, *only* in (43) will combine with the logical form in (26), repeated below.

(26)   he PAST [$_{VP}$ clean$_F$] because he had to [$_{VP}$ clean$_F$]

Rooth (1985) motivates the assumption that a sentence of the form *only* S is true just in case the ordinary value of S is the only true proposition in the focus value of S. It is apparent that this correctly predicts the truth conditions of *only BILL cleaned*, for example. However, the focus value of (26) contains propositions distinct from its ordinary value whose truth is intuitively compatible with (43). For example, (26) is intuitively compatible with the proposition that he shopped because he had to cook, even though this proposition is contained in the focus value of (26).

The theory of focus proposed by Kratzer avoids this problem by replacing (26) with (29a), repeated below, whose focus value contains only propositions of the form *that he Ped because he had to P*, thereby accounting for the perceived truth conditions of (43).

(29)   a.   he PAST [$_{VP}$ clean$_{F1}$] because he had to [$_{VP}$ clean$_{F1}$]
(31)   [$_{VP}$ clean$_F$] λ_1[he PAST t$_1$ because he had to Δ_1]

However, Hardt (1993) point out that the same result can be derived by analyzing silent verb phrases as bound variables. We have in fact already seen that (31), also repeated above, has the same focus value as (29a), and hence accounts for (43) as much as (29a) does. The results reached in this paper suggest that Hardt's analysis is indeed to be preferred over Kratzer's.

To conclude, let me return to the issue of silent verb phrases hosting traces. Since proforms by definition do not host traces, it is predicted that such silent verb phrases

cannot give rise to sloppy readings of the kind credited to bound proforms above. An example which might test this prediction is given in (44), which is analogous to (35) above except that the silent verb phrase in (A) hosts a trace.[18]

(44) A: When John cooks something, he doesn't say what he does.

     B: When he BAKES something, he doesn't, either.

Unfortunately, this case and similar ones are not fully significant since the (A) sentence is degraded in isolation. However, it seems that to the extent that (A) is acceptable, the above prediction is not borne out, that is, the discourse has a sloppy interpretation in which (B) says that John does not say what he bakes if he bakes something. Future research will have to determine how this observation is to be accounted for.

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[18] In (44), *does* is not inteNded to be read as main verb.

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