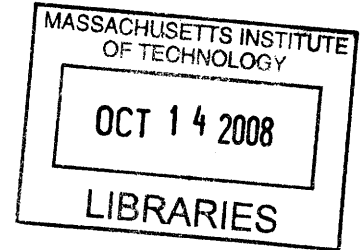# Focus Sensitive Coordination

by

Sarah McNearney Hulsey

A.B., Harvard College, 2001

SUBMITTED TO THE DEPARTMENT OF LINGUISTICS AND PHILOSOPHY
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY
at the
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SEPTEMBER 2008

Author..
Department of Linguistics and Philosophy

August 18, 2008

Certified by...........
Danny Fox
Professor of Linguistics
Thesis supervisor

Accepted by...
Irene Heim
Professor of Linguistics
Department Head

Focus Sensitive Coordination

by

Sarah McNearney Hulsey

Submitted to the Department of Linguistics and Philosophy
on August 30, 2008 in partial fulfillment for the
requirements of the degree of Doctor of Philosophy

Abstract

This thesis investigates the role of the Focus Sensitive Operators (FSOs) *even* and *also* when found inside of a coordination. Coordinations of this form are called Focus Sensitive Coordinations (FSC) and include *or even, and even, and also, not only...but also, let alone,* and *as well as.* I argue that *let alone* and *as well as* are composed of a coordination component and an (overt or covert) FSO adjoined to the left-hand coordinate. This analysis, taken together with Karttunen (1973)'s analysis of presupposition projection in disjunction, accounts for the fact that the existential presupposition of *even* does not project in an *or even* sentence, but it does in a *let alone* sentence. It is further shown that Focus Sensitive Coordination has a restricted distribution relative to ordinary coordination. In particular, FSC is generally possible only with propositional coordinates or coordinates that can be derived from propositional coordinates by way one of the kinds of ellipsis that can target coordination. Apparently smaller coordinates are subject to a range of prohibitions on remnants for gapping. This can be accounted for by a particular lexical entry for the FSOs and a prohibition against movement of the FSOs. Furthermore, a restriction on coordinations containing *even* adjoined to a noun phrase can be accounted for if we treat the resulting phrase as a generalized quantifier. Evidence from FSC also provides a new argument in favor of a treatment of *even* as being ambiguous between ordinary *even* and an NPI *even* (Rooth 1985). It is shown that an alternative treatment which achieves the NPI-like meaning by QR of *even* above a downward-entailing operator (Karttunen and Peters 1979) cannot account for the FSC cases where *even* is found inside of a coordination. That theory incorrectly predicts that coordinations in which *even* is associated with the less likely disjunct should be as grammatical as those in which it is associated with the more likely one. Finally, I provide an account of a scope asymmetry between conjunction and disjunction in gapping and show that, together with a pragmatic entailment that arises from one of the presuppositions of *even*, this provides an account for the fact that the scope of disjunction in FSC is restricted in a way that the scope of ordinary disjunction is not.

Thesis supervisor: Danny Fox

Title: Professor of Linguistics

Acknowledgments

I would like to thank my thesis committee, Irene Heim, Kyle Johnson, David Pesetsky, and most especially my supervisor Danny Fox. Their help, expertise, generosity, encouragement, and prodding were indispensable to me in the writing of this thesis. I also benefited greatly from my other professors at MIT, especially Kai von Fintel and Sabine Iatridou who advised me with the part of this work that began as a generals paper. Luis Alonso-Ovalle was extremely generous and helpful with the work that became my fourth chapter. Many thanks, too, to Jon Nissenbaum, who started me on this path as my undergraduate thesis advisor a number of years ago. His scholarship, kindness, and enthusiasm for linguistics, are largely responsible for me considering becoming a linguist in the first place.

I would also like to thank my classmates, Márta Abrusán, Seth Cable, Martina Gracanin-Yusek, Feng-fan Hsieh, Ivona Kučerová, and Tamina Stephenson for their friendship and camaraderie, as well as for countless useful and stimulating discussions over the years; in particular, I thank Tamina Stephenson, who was extremely generous and helpful with discussion related to this work. I am also indebted to my other fellow students at MIT, especially Valentine Hacquard and Shoichi Takahashi for their friendship, kindness, and generosity in discussions about my work.

On a personal note, I am grateful to my friends Maissa Boulos, Marjorie Cohn, Mazie Harris, Susannah Hollister, Amanda Nelson, Katherine McCanless Ruffin, and especially Jessica Greenberg, who has been wonderfully omnipresent for disasters and victories alike, and to my family Benjamin, Eileen, Natalie, and Peggy Hulsey and Margaret Sims for continual love and support while I was writing this thesis. Finally, I am thankful to my mother, Eileen Hulsey, and my sister, Natalie Hulsey, for graciously and good-naturedly giving me a staggering number of grammaticality judgments over the last few months.

Chapter 1: Introduction

1   Introduction

This thesis investigates the role of the Focus Sensitive Operators (FSOs) *even* and *also* when found inside of a coordination. I will refer to coordinations of this form as Focus Sensitive Coordinations (FSC). The environments studied include sentences containing *or even, and even, and also, not only...but also, let alone,* and *as well as*.

I argue that *let alone* and *as well as* are composed of a coordination component and a FSO adjoined to the left-hand coordinate, rather than to the right-hand one, as in the case of the other four FSCs studied. In particular, I argue that *let alone* is composed of *even* and disjunction, while *as well as* is composed of *also* and conjunction. In some cases, there is an overt *even* or *also* in the left-hand disjunct of a *let alone* or *as well as* sentence, respectively; in the rest, I argue that there is a covert *even* or *also* there. This analysis accounts for a number of parallels between *let alone* and *or even* and between *as well as* and *and even*.

It is shown that Focus Sensitive Coordination has a restricted distribution relative to ordinary coordination *and* and *or*. In particular, FSC is possible only with propositional coordinates or coordinates that can be derived from propositional coordinates by way of varieties of ellipsis that can target coordination. These kinds of ellipsis include gapping, right node raising, and stripping. It is argued that this restriction arises from a semantic requirement of the FSOs that they have propositional arguments. It is also possible in some cases for *even* to adjoin to a noun phrase. I argue that treating such phrases as generalized quantifiers and adopting an independently motivated version of the Coordinate Structure Constraint can account for some new facts involving this kind of phrase inside of a coordinate structure.

Evidence from FSC also provides a new argument in favor of a particular semantics for *even*. Sentences containing *even* and a downward-entailing (DE) operator are ambiguous, which is surprising given the lexical entry for *even* in non-DE environments. There are two proposals in the literature that account for the surprising 'wide-scope reading' for *even*. One of them, the scope theory, proposes that *even* can move above the DE operator (Karttunen and Peters 1979). The other, the lexical ambiguity theory, gives a different lexical entry to the *even* found in this kind of

environment such that *even* is interpreted *in situ* (Rooth 1985). I will show that the 'wide-scope reading' for *even* is available when *even* is found in a coordination. In order to account for these facts, the scope theory would have to assume a Coordinate Structure Constraint violating movement, which is problematic. I will show that even if we assume such a movement is possible, the scope theory cannot account for the facts, but the lexical ambiguity theory can.

Finally, there is a scope reading in sentences with ordinary disjunction that is not available in sentences with a disjunctive FSC (*or even* and *let alone*). Before discussing this asymmetry, I first give an account of the scope of disjunction in propositional coordination. Here I focus on disjunction in gapping sentences, which, under an independently motivated analysis, have propositional coordinates (Johnson 1996). Though conjunction in gapping cannot take scope above a modal that c-commands the conjuncts, disjunction can. This fact has been used to argue against a syntactic analysis of gapping in which the coordinates are always *v*Ps. I show that the disjunction facts can be accounted for with an alternative semantics for disjunction. This analysis, together with a pragmatic entailment that arises from one of the presuppositions of *even*, provides an account for the restricted scope of disjunction in FSC.

2   Propositional coordination in gapping

Much of this thesis relies on a particular analysis of gapping, the Siegel-Johnson analysis, which I will introduce here. It has been shown that in coordination in which a modal or negation c-commands two conjuncts, each containing at least a subject and a verb, the coordination is below T (Siegel 1987). That is, the coordinates are not full TPs with an elided modal or negation in the second coordinate, but rather are smaller than TP. Johnson (1996) has argued that the coordinates in gapping are *v*Ps. Since many of the environments allowing Focus Sensitive Coordination will be shown to involve *v*P-coordination or coordination of phrases that can be derived from *v*P coordination, this section will present the relevant background.

10

2.1 VP-conjunction

In gapping, a form of ellipsis first identified and named by Ross (1967), two propositional phrases are coordinated, and the verb, auxiliary, or modal (and sometimes other material) in the second conjunct is not pronounced (1).

(1)   John ate spaghetti and Jane — lasagna.

(2)   John ate spaghetti and Jane ate lasagna.

The gapping sentence in (1) is interpreted as if the unpronounced material *ate* were present in the second conjunct, as in the un-gapped (2).

Proposals for the structure of gapping sentences can be roughly divided into two camps based on the size of the constituent conjoined. These two structures are schematized in (3) and (4). The two trees are intended to represent structural relationships only. Struck-through material should be viewed only as an indication that those words are unpronounced—I am ignoring for the moment any particular mechanisms for deriving the gaps. Following the conventional practice, I will use the term Large Conjunct Structure for (3), in which the conjoined phrases are TPs, and Small Conjunct Structure for (4), in which the conjuncts are VPs (or, more accurately in current terminology, *v*Ps, i.e., the verbal phrase in which the subject is generated).[1] I also will ignore for the moment the apparent Coordinate Structure Constraint violation in the movement of the subject *John* in the structure in (4); this will be discussed below.

---

[1] Much work on coordination has been devoted to discovering the nature of the phrase created by coordination, including whether it is of the same category as the coordinates or whether it is of a special category projected by the coordination (this phrase has variously been called ConjP, BP (for Boolean Phrase), and CoP). I will have nothing to contribute to this debate. For concreteness, I will adopt the assumption that it has the category of the coordinates, though nothing hinges on this assumption.

(3)   Large Conjunct Structure

```
                              TP
                 _____
             TP _____            _____
            /     \          and         TP
         John      \                    /    \
              _____\              Jane  _____\
             T        VP                T        VP
             will    /  \               will    /  \
                    V    NP                     V    NP
                    eat  spaghetti              eat  lasagna
```

(4)   Small Conjunct Structure

```
              TP
             /    \
          John     \
             _____\
            T         VP
            will     /   \
               VP ____  and  \
              /  \            \
             t    \            VP
                 / \         Jane  ___\
                V   NP            V    NP
                eat spaghetti     eat  lasagna
```
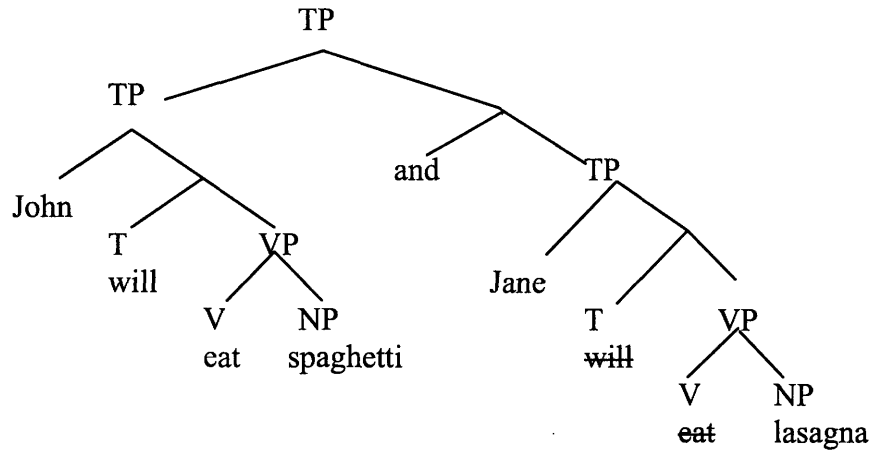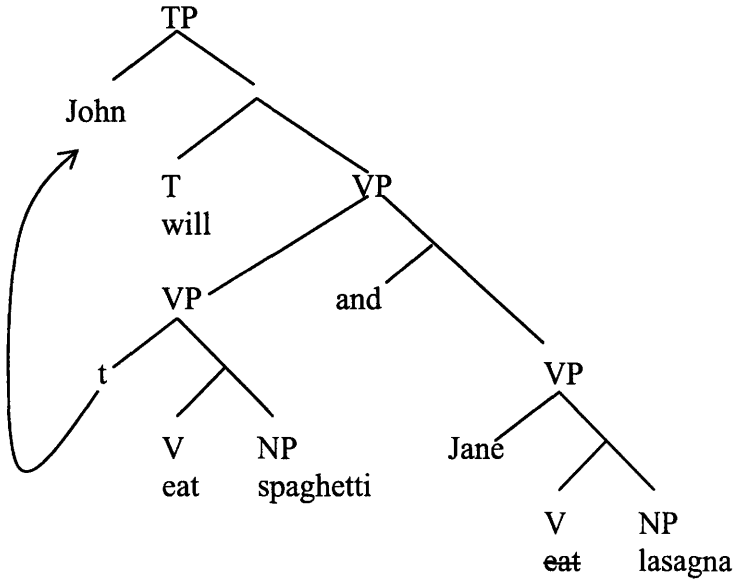
The evidence from the literature comes out in favor of the Small Conjunct Structure (4) (Siegel 1987; Johnson 1996, 2001; Lin 2000, 2002; Coppock, 2001; and others). The particular account I will adopt is basically that of Johnson (1996). In this section, I will review some of the relevant arguments.

On the basis of examples like those in (5), Siegel (1987) argues that in gapping sentences, conjunction is below the level of tense, negation, aspect, and modals.[2]

---

[2] Oehrle (1987) makes similar observations about the scope of adverbs, tense, and modals with respect to coordination in gapping sentences.

(5) a.   Oh, no! The villain hasn't ended up with the whole ranch and the hero ended up with only óne horse!

     b.   Ward can't eat caviar and his guest eat dried beans.

     c.   Warren can't go out drinking and his wife stay home with the baby.

                                                                   (Siegel 1987, 53-4)

In each of these examples, the modal-negation or auxiliary-negation complex is interpreted outside of the scope of conjunction. To show this, I will use a slightly different example than the Siegel cases. I use a deontic modal to avoid some unrelated complications in sentences with ability modals. Also, I use a sentence without negation to simplify the sentence from one with three scope-taking elements to one with only two. I will discuss the role negation plays in these sentences in chapter 4.

(6)   In this bus, you can sit in the back and your child stand in the front.

Take the sentence in (6). The only interpretation for this sentence has *can* outscoping conjunction. It means that the following is permitted (according to the municipal rules, the bus driver, or some other authority): you sit in the back and your child stands in the front. The permission is given for the two to happen at the same time.

        There is another reading that is not available in (6) in which *and* outscopes *can*. On such a reading, each action would be independently allowed, though not necessarily simultaneously. This reading is consistent with the two actions not being allowed to happen at the same time. To see what the reading would look like, consider the counterpart of (6) that does not involve gapping.

(7)   In this bus, you can sit in the back and your child can stand in the front.

The sentence in (7) each conjunct contains a modal, giving the scopal configuration that we are interested in: *and* > *can*. This sentence is perfectly consistent with the two permitted actions not being permitted to occur simultaneously, as the following dialogue shows.

(8) a. Bus driver: Why is your child not beside you?

b. Parent: Can't he stand in the front of the bus?

c.' Bus driver: You can sit in the back and your child can stand in the front …but whatever you do you have to be next to your child.

Using the same dialogue, we can show that the gapping example in (6) is not consistent with the two actions being prohibited from happening simultaneously.

(8) c." Bus driver: *You can sit in the back and your child stand in the front …but whatever you do you have to be next to your child.

The only reading for (6) gives permission for the two events to happen simultaneously. Thus, only the *can* over *and* reading is available for the gapping sentence.[3]

This fact follows naturally from a Small Conjunct Structure in which gapping always involves VP-level coordination, below the level of the modal. The schematic structure, after reconstruction of the subject of the first conjunct, would be:

(9)
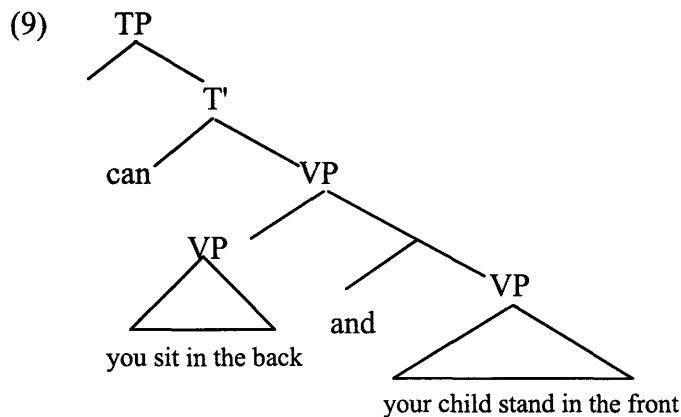
With this structure for gapping, it is clear why the narrow-scope modal reading is unavailable for (6): there is no elided modal in the second conjunct (that is, (6) is not derived from (7)) and, since the modal is never within the second conjunct, it cannot reconstruct there. On the other hand, both the mere availability of narrow-scope

---

[3] The non-gapped sentence (7) is of course also consistent with the two events being permitted simultaneously, but only it and not (6) is consistent with the two not being so permitted. Hence, the continuation in (8)c is a useful test for the scopal relations since, with a permission modal, only *can* over *and* gives the reading where the permission is given specifically for the two events to happen together.

14

conjunction and the restriction to that reading would be mysterious if gapping had the Large Conjunct Structure in (3), in which each conjunct is large enough to contain its own modal.

Modulo the surface position of subjects, this is a straightforward case of VP-conjunction. We can call this kind of example T-gapping, since the second conjunct is missing only the modal or auxiliary that appears in T. In this case, each conjunct has both its own verb and its own subject. There are related examples, like (10) in which the second conjunct is missing a verb as well. Such a sentence is a more canonical example of gapping, which we can call V-gapping.

(10)   In this bus, you can sit in the back and your child, in the front.

Unlike the T-gapping examples, the V-gapping example in (10) appears to be ambiguous between wide-scope and narrow-scope conjunction (Siegel 1984, 1987). This sentence, unlike the T-gapping one, is consistent with the continuation in the dialog in (8), suggesting that the wide-scope conjunction reading is available, in addition to the narrow scope one. One way to understand this ambiguity is that sentences like (10) are ambiguous between the Small Conjunct Structure and the Large Conjunct Structure. This is an unsatisfactory conclusion, since it is not clear why the ambiguity is possible for V-gapping but not for T-gapping. However, this remains an open question at this time.

There is another property that T-gapping sentences share with (at least one of the readings of) V-gapping sentences: there is an asymmetry in height between the subjects of the two conjuncts. McCawley (1993) observed that a quantifier in the subject of the first conjunct is able to bind a variable inside the second conjunct. This phenomenon is known as Cross-Conjunct Binding.

(11)   No one$_i$'s duck was most enough or his$_i$ mussels tender enough.
                                                                    (McCawley 1993, 248)

(12)   Not every$_i$ girl ate a green banana and her$_i$ mother a ripe one.
                                                                    (Johnson, 2006, 19)

In (12), the subject of the first conjunct, *not every girl*, binds the pronoun *her*, which is situated inside the second conjunct. If these sentences (only) had the Large Conjunct Structure, then the pronoun binding could not be accounted for, since in that structure the first subject does not c-command the second one. The Large Conjunct Structure essentially replicates a non-gapped structure, in which each conjunct is large enough to contain its own T head. If this were the right structure for the gapping sentences, we would expect the binding facts to pattern with the non-gapped counterparts of (11) and (12), in which each conjunct clearly does have a T head, as in (13)-(14).

(13)   *No one$_i$'s duck was most enough or his$_i$ mussels were tender enough.

(14)   *Not every$_i$ girl ate a green banana and her$_i$ mother ate a ripe one.

As we can see in (13) and (14), cross-conjunct binding is impossible when the conjuncts are large enough to each be TPs. Given the difference in grammaticality of (11)-(12) and (13)-(14), different structures are indicated.

The facts in (11) and (12) demonstrate that the subject of the first conjunct must asymmetrically c-command the second conjunct. The c-command facts are correctly captured by the Small Conjunct Structure in (4), because the first subject moves to Spec, TP, while the second subject remains *in situ*. In this configuration, the quantified phrases *not every girl* and *no one's duck* c-command the relevant pronouns, allowing for binding. Thus, the pronoun binding facts support a structure in which the first subject asymmetrically c-commands the second subject. This same unusual fact holds for T-gapping, (15).

(15)   Not every girl will eat a green banana and her mother consume a ripe one.

Taken together, the facts in this section support the Small Conjunct Structure for T-gapping and show that it is available for V-gapping as well.

2.2 Asymmetrical subject movement in the Small Conjunct Structure

The Small Conjunct Structure in (4) has a single T node, and, hence, a single derived-subject position. The second subject remains *in situ* in its *v*P, since gapping sentences always have two subjects. This analysis adopts the VP-internal subject hypothesis (Koopman & Sportiche (1985, 1991), Kitagawa (1986), Fukui & Speas (1986), and Kuroda (1988)). On this hypothesis, *v*Ps are propositional—subjects are generated inside the *v*P. Under normal circumstances, the subject moves out of the *v*P in order to satisfy the EPP features of T. In the case of a Small Conjunct gapping structure, there is only one T, hence only one EPP feature. This feature is satisfied by movement of the subject of the first conjunct into Spec, TP, allowing the second subject to remain *in situ*.

One potential worry about this analysis is the apparent violation of the Coordinate Structure Constraint (CSC) by the asymmetrical A-movement of the subject.

(16)   Coordinate Structure Constraint: In a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct. (Ross 1967, 161)

The CSC, as originally formulated by Ross (1967), rules out a sentence like (17)a because the *wh*-phrase is extracted from the first conjunct. A well-known exception to this constraint is the case of Across-the-Board movement: extraction from a coordinate structure is possible so long as the item in question is extracted parallelly from both conjuncts (17)b.

(17)   a.   *[What language]$_i$ does Bob speak t$_i$ and Mary understand Taiwanese?
          b.   [What language]$_i$ does Bob speak t$_i$ and Mary understand t$_i$?

The structure in (4) appears to violate the CSC: the subject of the first conjunct undergoes A-movement without a parallel movement from within the second conjunct. As Johnson (1996) and Lin (2001) point out, nearly all of the arguments in the literature about the CSC use examples of A'-movement, though it has been widely assumed to apply to A-

movement as well. In fact, the claim that it does has been used to argue for the VP-internal subject hypothesis, in order to account for the ability of active and passive sentences to be coordinated (Burton and Grimshaw 1992; McNally 1992).

Lin (2001, 2002) argues that the Small Conjunct Structure is not a counterexample to the claim that A-movement is subject to the CSC and that if we adopt a particular account of the CSC, the apparent CSC-violating movement in (4) can be given the same analysis as other asymmetric movements out of a coordinated structure discovered by Ruys (1992). Ruys' observations involve coordinated structures out of which a phrase moves either by covert *wh*-movement or by Quantifier Raising (QR). As in the case of overt *wh*-movement (17)a, covert *wh*-movement out of only once conjunct is not possible, (18).

(18)   a.   *I wonder [$_{CP}$ who$_i$ [t$_i$ [took what from Mary] and [gave a book to Fred]]].

       b.   LF: *I wonder [$_{CP}$ who$_i$ what$_j$ [t$_i$ [took t$_j$ from Mary] and [gave a book to Fred]]].

<div align="right">(Ruys 1992, 36)</div>

Similarly, QR out of only one conjunct is not possible (Lakoff 1970; Rodman 1976). Whereas both scope readings are possible in (19), in (20) the inverse scope reading—which would arise by QR of *every professor* out of the first conjunct—is not possible, (example taken from Fox (2000), 51).

(19)   A (different) student admires every professor.
       a > every; every > a

(20)   a.   A (#different) student admires every professor and despises the Dean.
            *a > every; *every > a*

       b.   LF for *every > a*
            *[every professor]$_i$ [a student [admires t$_i$] and [despises the Dean]].

18

Ruys (1992) observed that with both covert *wh*-movement and QR[4], an obviation of the CSC is possible if the covertly moved phrase binds a pronoun in the other conjunct.

(21)   a.   I wonder [$_{CP}$ who$_i$ [t$_i$ [took what$_j$ from Mary] and [gave it$_j$ to Fred]]].

         b.   LF: I wonder [$_{CP}$ who$_i$ what$_j$ [t$_i$ [took t$_j$ from Mary] and [gave it$_j$ to Fred]]].

(Ruys 1992, 36)

(22)   a.   A (different) student admires [every professor]$_i$ and wants him$_i$ to be on his committee.
            a > every; every > a

         b.   LF for *every > a*
            [every professor]$_i$ [a student [admires t$_i$] and [wants him$_i$ to be on his committee]].

(Fox 2000, 52)

Ruys proposes that the bound pronoun in the second conjunct of (21) and (22) are resumptive pronouns incorporated into the tail of the movement chain. A revision of this approach is given by Fox (2000). Fox adopts a multidimensional analysis of coordination in which the well-formedness of coordinate structures is evaluated independently, based on the principles in (23).

(23)   a.   Extraction out of a coordinate structure is possible only when the structure consists of two independent substructures, each composed of one of the coordinates together with material above it up to the landing site (henceforth, *component structures*).

         b.   Grammatical constraints are checked independently in each of the component structures.

(Fox 2000, 50)

---

[4] Rodman (1976) notes a similar exception in cases like (20) that have a bound pronoun in the second conjunct. See also Lakoff (1970).

   (i)   A soldier found every student$_i$ and shot him$_i$.   (Rodman 1976, 172)
         every > a soldier

Fox then explains the ungrammaticality of (18) and the unavailability of the inverse scope reading of (20) on the basis of (23) and a principle against vacuous quantification. The component structures of (18) and the inverse scope reading of (20) are given in (24).

(24)   a.   i.   [who$_i$ what$_j$ [t$_i$ [took t$_j$ from Mary]]]
                ii.   *[who$_i$ what$_j$ [t$_i$ [gave a book to Fred]]]

        b.   i.   [every professor]$_i$ [a student [admires t$_i$]
                ii.   *[every professor]$_i$ [despises the Dean]

In both (24)aii. and (24)bii., the component structure corresponding to the right-hand conjunct violates the prohibition on vacuous quantification, which accounts for the ungrammaticality. In the Ruys pronoun binding cases, though, neither component structure involves vacuous quantification.

(25)   a.   i.   [who$_i$ what$_j$ [t$_i$ [took t$_j$ from Mary]]]
                ii.   [who$_i$ what$_j$ [t$_i$ [gave it$_j$ to Fred]]]

        b.   i.   [every professor]$_i$ [a student [admires t$_i$]
                ii.   [every professor]$_i$ [wants him$_i$ to be on his committee]

In (25)b, the universal quantifier binds a trace in the first component structure and the pronoun *him* in the second. Thus both conjuncts are well-formed and there is no violation. The same applies to (25)a. This way of reformulating the CSC accounts for the violations with overt and covert movement out of only one conjunct, the traditional ATB-movement exceptions (where each component structure contains a bound trace of movement), and the Ruys pronoun binding facts.

      Lin (2002) proposes that adopting the Fox-Ruys account of the CSC violations above can also explain why asymmetrical subject movement is allowed in the Small Conjunct Structure. Consider the difference between (26) and (27). In (26), the quantifier *many* can either take scope above *can't* or below it. Wide-scope *many* gives the reading that for many (individual) drummers, it is not the case that they can leave on Friday; narrow-scope *many* gives the reading that it cannot be the case that many drummers leave on Friday.

20

(26)　Many drummers can't leave on Friday.　　　　　　　　(Lin 2002, 72)
　　　many > can't; can't > many

(27)　Many drummers can't leave on Friday and many guitarists arrive on Saturday.
　　　*many > can't; can't > many　　　　　　　　(Lin 2002, 72)

In the gapping sentence (27), *many drummers* must have scope below *can't*, i.e., it cannot be the case the following happens: many drummers leave on Friday and many guitarists arrive on Saturday, for example because there would then be an unequal number of drummers and guitarists at a music camp. *Many drummers* cannot have scope above *can't*, which would correspond to a reading that for many (individual) drummers, it cannot be the case that they leave on Friday and many guitarists arrive on Saturday. We can see why this reading is prohibited based on the component structures in (28)a. The second component structure contains a violation of the constraint against vacuous quantification and so should be ruled out by the Fox-Ruys account of the CSC. The narrow scope reading for *many drummers* gives the component structures in (28)b, both of which are well-formed.

(28)　*many > can't*
　　　a.　i.　　[many drummers]$_i$ can't [t$_i$ leave on Friday]
　　　　　ii.　　*[many drummers]$_i$ can't [many guitarists arrive on Saturday]

　　　can't > many
　　　b.　i.　　can't [many drummers leave on Friday]
　　　　　ii.　　can't [many guitarists arrive on Saturday]

This means that the moved subject must be reconstructed if one of the component structures would otherwise violate the constraint against vacuous quantification.

　　　Lin shows that the cross-conjunct binding facts in (11)-(12) and (29) can be treated as an exception to the CSC in the same way as the Ruys pronoun binding cases.

(29)　[Not every girl$_i$] will buy a hat and her$_i$ brother buy a sweatshirt.

(30)　a.　　[not every girl$_i$] [will [t$_i$ buy a hat]]
　　　b.　　[not every girl$_i$] [will [her$_i$ brother buy a sweatshirt]

The subject *not every girl* binds a trace in the first component structure and a pronoun in the second. In this way, the sentence does not violate the Fox-Ruys version of the CSC since each component structure is well-formed. Thus the Small Conjunct Structure, while containing A-movement out of only one of the conjuncts, does not violate the reformulated, independently motivated version of the CSC due to Fox (2000). I will assume henceforth that the asymmetrical subject movement does not provide an argument against the Small Conjunct Structure.

2.3   Scrambling and Predicate Shift

A question that remains after adopting the Small Conjunct Structure for V-gapping is how the gaps themselves are derived. For this thesis, what is crucial is only that gapping sentences consist of *v*Ps conjoined below Tense and other functional heads. For concreteness, I will adopt the analysis of Johnson (1996, 2006) for the derivation of the gaps, but I believe my work would be consistent with any approach that adopted a Small Conjunct Structure.

Essentially, Johnson argues that all gaps, both single and complex,[5] can be accounted for by scrambling of anything not shared out the *v*P, followed by Across-the-Board (ATB) movement of the remnant *v*Ps leftwards (containing now only the shared elements and traces). The operation for this ATB movement is called Predicate Shift, which is an operation that has been used to account for the shape of verbal complexes in other Germanic languages (Zwart 1993, 1997; Hinterholzl 1999; Koopman and Szabolcsi 2000), and Johnson dates it to Larson (1988)'s analysis of heavy NP-shift.

To see how this works for a single gap, take (31) as an example. The final structure is the result of several separate movements. First, the two *v*Ps are constructed as usual, (32)a. Then, in each of the *v*Ps, all non-shared phrases scramble out, adjoining to a phrase that immediately dominates *v*P, which Johnson calls XP, (32)b. Thirdly, the two *v*Ps, which now contain only the shared verb and traces of the scrambled-out phrases,

---

[5] In conventional terminology, *single gaps* are gaps of only the verb in the second conjunct (i); *complex gaps* are gaps of the verb and other material, whether adjacent to the verb or not (ii); here and elsewhere, unpronounced material is indicated by strikethrough (examples taken from Johnson 1996).
 (i)   Some ate nattoo and others ~~ate~~ rice.
 (ii)   a.   Some gave albums to their spouses and others ~~gave~~ tapes ~~to their spouses~~.
         b.   Some when out to buy beer and others ~~went out to buy~~ fried chicken.

undergo Across-the-Board Predicate Shift movement to the specifier of a Predicate Phrase, (32)c. Finally, the various functional heads are merged and the subject of the first (leftmost) conjunct undergoes a further movement to Spec, TP, (32)d. The result of this series of movements gives the gapping word order of (31).

(31) John will eat peas and Mary carrots.

(32) a.

b.

c.

d.
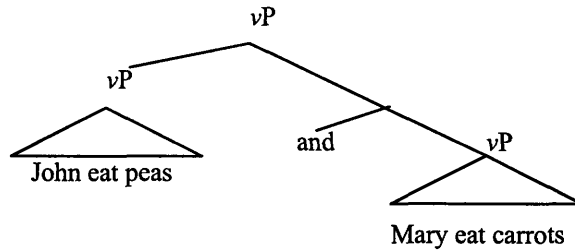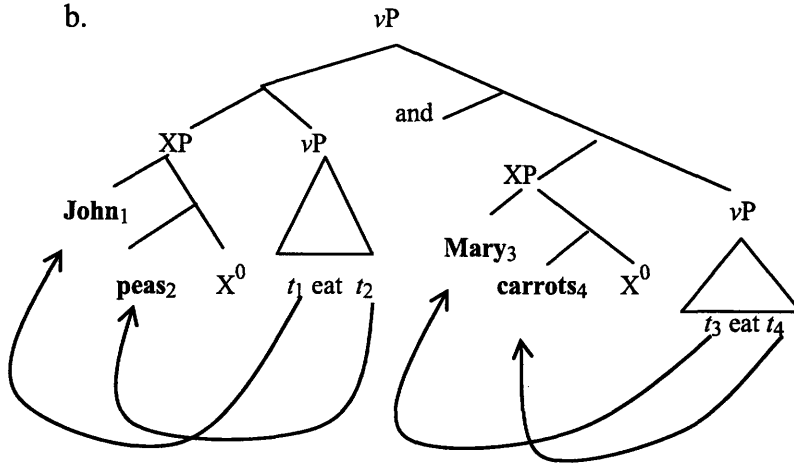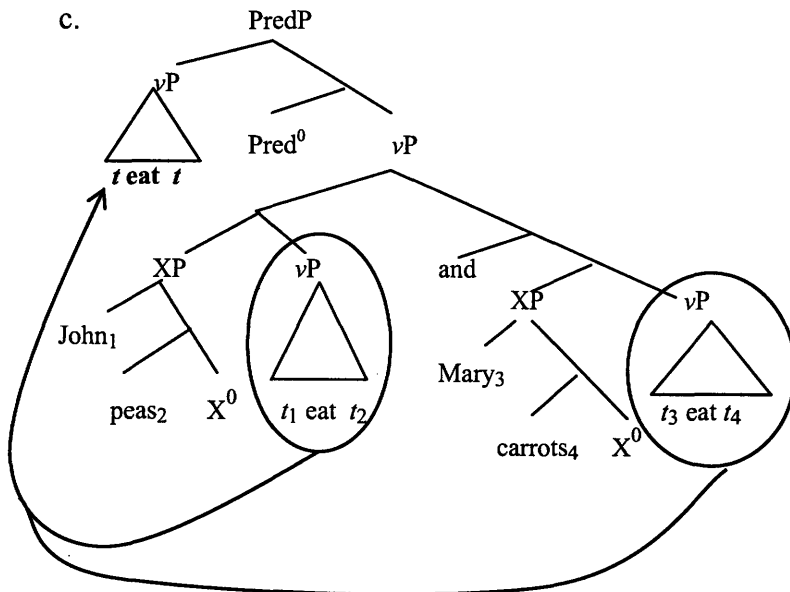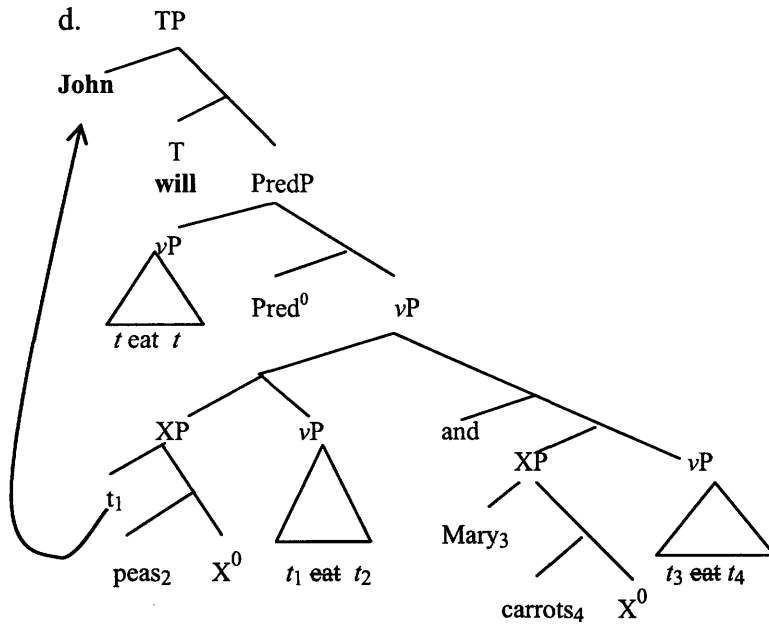
Similar movements can be used to account for other cases of gapping. What these derivations have in common is scrambling of the non-shared material from each vP, followed by ATB predicate shift movement of the resulting vPs. T-gapping examples are accounted for with a similar VP-conjunction structure, but with no ATB-movement.

For the reasons outlined in this section, throughout this work I will assume the Small Conjunct Structure for gapping: coordination is of vPs.

Chapter 2: Syntax of Focus Sensitive Coordination

1   Introduction

This chapter investigates the distribution and syntax of coordinations in which one of the coordinates contains a Focus Sensitive Operator (FSO) like *even* or *also*. I will call such coordinations Focus Sensitive Coordination (FSC) to reflect the fact that the coordination as a whole has particular properties that differ from coordinations without a FSO. Throughout, I will use the term <u>coordination</u> to encompass both conjunction and disjunction, and <u>coordinate</u> to encompass both conjunct and disjunct. The expressions I will look at include some that are straightforwardly coordination plus a FSO, such as *or even, and even, and also*, and *not only...but also*. I will also investigate certain expressions that may not be as obviously composed of coordination plus a FSO, such as *let alone* and *as well as*. I will argue that *let alone* (and related expressions like *much less, not to mention, nevermind*) is equivalent to disjunction with *even* associated with the left-hand coordinate—in some cases overtly, in the rest covertly; *as well as* (and the related *in addition to*) is conjunction with *also* associated with the left-hand coordinate, again, either overtly or covertly.

First, I will show that *let alone* and *as well as* are forms of coordination by demonstrating that they are subject to the Coordinate Structure Constraint and that they are compatible with elliptical processes limited to coordination. This is surprising on the face of it; we are used to thinking of constraints on coordination as applying exclusively to *and* and *or* (and possibly *but*). The results here will suggest that many of the properties of coordination can also be found in a larger range of expressions whose similarity in this respect has been masked by other factors, such as NPI-hood and scalar components.

Secondly, I will argue that Focus Sensitive Coordination is limited to coordination of propositions. This will first be demonstrated with coordinations of small clauses and of *v*Ps. It will then be shown that there are, in fact, many environments in which FSC of phrases apparently smaller than propositions is allowed, but it will be shown that the only such allowed environments are ones in which there is a derivation that involves propositional coordination followed by a form of ellipsis such as gapping or right node raising.

Why should FSC be limited to propositions? One common analysis of *even* argues that it takes a propositional argument. I will argue that, contrary to some previous treatments, *even* cannot ever move on its own in order to satisfy this semantic requirement. Those sentences in which it appears to have a smaller phrase as an argument are only those in which there is a derivation that gives the FSO an argument of the right type. When the FSO is found in a coordination, as in the environments investigated here, the coordinate containing it must be propositional. Finally, in certain cases it is necessary to assume that, in additional an lexical entry for *even* that takes a propositional argument, there is a variant of *even* that can combine with noun phrases forming a generalized quantifier, whose movement is then subject to the Coordinate Structure Constraint.

2   Coordination-like properties of *let alone* and *as well as*

This section will show that even those FSCs that do not obviously contain coordination, such as *let alone* and *as well as*, are subject to the Coordinate Structure Constraint and that they can be used with elliptical processes limited to coordination such as gapping, right node raising, and stripping.

2.1   The Coordinate Structure Constraint

One of the distinguishing properties of coordination is that it is not possible to extract from a single coordinate. Take (1). Extraction is not possible from either of the coordinated objects.

(1)   a.   *Which candidate did John support _ and Mary campaign for Clinton?

b.   *Which candidate did John support Obama and Mary campaign for _?

The traditional formulation of this prohibition is Ross's Coordinate Structure Constraint (CSC), which states that in coordinate structures, neither whole coordinates nor elements within them may be moved out of the coordinate structure (Ross, 1967). The introductory chapter presented the Fox-Ruys account of the Coordinate Structure Constraint, which provides an explanation for these prohibitions based on a constraint against vacuous

quantification. I will not repeat the account here, but will simply use the CSC as a test for coordination-hood.

To show that *let alone* and *as well as* behave like *and* and *or* with respect to the CSC, I will compare them to elements which are not subject to the constraint, namely items like *before* which introduce adjuncts. To the extent that *let alone* and *as well as* behave like *and*, *or*, and *but*, and not like the subordinating *before*, we can take that as evidence that it is a true coordination, and not what was traditionally called a subordinating conjunction.

The CSC prohibits movement out of a coordinate (1), but a well know exception to this generalization, also due to Ross (1967), is that such movement is permitted just in case there is parallel extraction from the other coordinate, so-called Across-the-Board (ATB) movement (2). As we have seen, extraction from only one coordinate is ungrammatical (1). There is no such constraint on a phrase preceding an adjunct (3), however.

(2)   Which candidate did John support _ and Mary campaign for _? .

(3)   Which candidate did John support before Mary campaigned for Clinton?

Let alone and *as well as* behave like *and* and *or* in this respect: it is not possible to extract from only one conjunct (4)b,c–(5)b,c, but it is possible to extract from both in parallel (4)d–(5)d.

(4)   a.   John didn't support Obama, let alone Mary campaign for Clinton.

        b.   *Which candidate didn't John support, let alone Mary campaign for Clinton?

        c.   *Which candidate didn't John support Obama, let alone Mary campaign for?

        d.   Which candidate didn't John support, let alone Mary campaign for?

(5)   a.   John will support Obama, as well as Mary campaign for Clinton.

        b.   *Which candidate will John support, as well as Mary campaign for Clinton?

      c.   *Which candidate will John support Obama, as well as Mary campaign for?

      d.   Which candidate will John support, as well as Mary campaign for?

(4)c–(5)c on their own would be compatible with an account in which *let alone Mary campaign for which candidate* and *as well as Mary campaign for which candidate* are adjuncts, since adjuncts are themselves islands for movement. However, the ungrammaticality of (4)b–(5)b show that there is a prohibition on extraction from the first clause as well. This, together with the fact that the ungrammaticality is repaired by ATB extraction, indicates that (4) and (5) contain coordination islands, not adjunct islands. Thus, to the extent that the Coordinate Structure Constraint can be taken to diagnose coordination, these data suggest that, despite not being superficially similar to conjunction or disjunction, *let alone* and *as well as* are forms of coordination.

2.2   Elliptical processes requiring coordination

Another diagnostic we can use for coordination-hood is whether an expression is compatible with elliptical processes known to require coordination. Three such processes are gapping, right node raising, and stripping (also called bare-argument ellipsis). This section will show that *let alone* and *as well as* are allowed with all of these forms of ellipsis and thus provides a second argument that they are forms of coordination.[1]

2.2.1   *Let alone, as well as,* and gapping

Gapping is well known to be possible in coordination structures but not in adjunction structures, as seen in (6). It is also possible with *let alone* and *as well as*, as seen in (7) and (8).

(6)   a.   John will eat peas and Mary carrots.

       b.   John will eat peas or Mary carrots.

---

[1] Fillmore et al. (1988) have used the fact that *let alone* can be used with forms of ellipsis requiring coordination as an argument that *let alone* shares some of the properties of coordinating conjunctions. However, they conclude that *let alone* does not actually conjoin phrases, on the basis of facts like the inability to do VP-ellipsis with *let alone* or to topicalize the (apparent) constituent formed by combination of two noun phrases by *let alone*. Both of these facts will be accounted for by the analysis provided here of *let alone* as Focus Sensitive Coordination. Thus the ability of *let alone* to appear with ellipsis requiring coordination is taken to reflect just what it appears to: *let alone* is a coordinating expression.

28

      c.   *John will eat peas before Mary carrots.

      d.   *John will eat peas because Mary carrots.

(7)   John won't eat peas, let alone Mary carrots.

(8)   John will eat peas, as well as Mary carrots.

That *let alone* and *as well as* are possible in gapping should be taken as evidence that they are forms of coordination, since gapping is generally restricted to coordination.

    To really convince ourselves that (7) and (8) are gapping and not just superficially similar, let us go over some of the properties of gapping and see that sentences like (7) and (8) share these properties. I will demonstrate this here with *let alone*, though the same facts hold for *as well as*. As discussed in the introduction, one gapping-specific property is that a quantifier in the subject of the first coordinate can bind a pronoun in the second (McCawley 1993; examples taken from Johnson 1996).

(9)   a.   Not every$_i$ girl ate a green banana and her$_i$ mother a ripe one.

        b.   No$_i$ boy joined the navy and his$_i$ mother the army.

In both examples in (9), a pronoun in the second conjunct is bound by a quantifier in the subject of the first conjunct. Similar binding is not possible in either VP-ellipsis (10)a or pseudogapping (10)b.

(10)   a.   *Not every$_i$ girl ate a green banana, and her$_i$ mother did, too.

        b.   *Not every$_i$ girl ate a green banana, and her$_i$ mother did a ripe one.

We have already seen in the previous chapter how the Small Conjunct Structure for gapping accounts for this asymmetry. Here I would like to focus not on an account but on this phenomenon as a diagnostic for gapping. The following two examples show that in *let alone* sentences, cross conjunct binding is allowed.

(11)   a.   No$_i$ wrestler joined the army, let alone his$_i$ pacifist brother the marines.

        b.   No$_i$ dog could learn to juggle, let alone its$_i$ owner outrun a greyhound.

In both cases, the pronoun in the second coordinate is bound by the quantifier *no* in the first coordinate, just as in (9). These examples show us that *let alone* is possible in an environment that is particular to gapping.

      The second gapping-specific property is that, unlike in the superficially similar pseudogapping, neither a gap nor its antecedent may be in an embedded clause, a prohibition discovered by Hankamer (1971). We will not be able to test the prohibition on an embedded gap with *let alone* and *as well as*, since, as we will see, they may not coordinate TPs. I will give instead examples showing sentences like (7) and (8) are subject to the other part of Hankamer's prohibition—it is not possible for a gap to have an embedded antecedent. This prohibition can be seen for a gapping sentence with *and* in (12)a, in contrast to the pseudogapping example in (12)b which does allow an embedded antecedent.[2]

(12)   a.   *The babysitter denied that Peter has eaten candy, and Sally her green beans, so their mother says the children can have dessert.

        b.   The babysitter denied that Peter has eaten candy, and Sally hasn't any junk food, so their mother says the children can have dessert.

Turning to *let alone*, we see the same prohibition against a gap that has an antecedent in an embedded clause.

(13)   *The babysitter didn't say that Peter has eaten his apple slices, let alone Sally ~~has eaten~~ her green beans. … so they can't have any ice cream tonight.[3]

---

[2] The more minimal (i), which has negation in only the first conjunct, is quite odd. I do not have an account of why the pseudogapping example in (i) is ungrammatical, nor why it is saved by the presence of two negations—a move that does not improve the gapping example.

     (i)   ??She denied that Peter has eaten candy, and Sally has her green beans …so they can have dessert.
This puzzle, though interesting, does not bear on the point at hand.

[3] Oehrle (1987) and Siegel (1984, 1987) discovered that clausal negation takes scope over the coordination in a gapping sentence, so if gapping were possible, the NPI requirements of *let alone* would be satisfied— that is not the source of the ungrammaticality here. This can be seen in (i) where the antecedent to the gap is not embedded and the sentence is fine:

Here it is not possible to construe the gap as having its antecedent in the embedded clause *Peter has eaten his apple slices*. Thus we see the same restriction on *let alone* that we saw with gapping with *and*.

In this section we have seen that *let alone* and *as well as* can occur in gapping sentences. Moreover, we have seen that an overview of some properties peculiar to gapping confirms this observation. Since coordination is one of the few environments that allows gapping, we can take this as suggestive evidence that *let alone* is a form of coordination.[4]

2.2.2 *Let alone, as well as,* and right node raising

Another form of ellipsis generally limited to coordination is right node raising (RNR). In an RNR construction, so-named by Postal (1974), the coordinates share some material at the right periphery of the sentence.

(14)   Jack may be, and Tony certainly is, a werewolf.   (Postal 1974, 126)

(15)   a.   John gave Mary, and Bill gave Sue, a love letter for Valentine's Day.

         b.   *John gave Mary, before Bill gave Sue, a love letter for Valentine's Day.

In RNR, as in gapping, a coordinate structure is generally required. An adjunction structure does not allow the ellipsis, (15)b. *Let alone* and *as well as* are allowed with this construction (16)a and (17)a (as are, of course, the disjunction and conjunction with which (16)a and (17)a form minimal pairs, (16)b and (17)b, respectively).

(i)   The babysitter didn't say that Jack had eaten his peas, let alone the mother ~~say~~ that Jill would eat
        hers.
[4] Gapping is also possible in comparatives, (i), which weakens the claim that from the appearance of *let alone* with gapping we can conclude that *let alone* is a coordination.
    (i)   John talked to Mary more often that Bill to Sue.
The appearance of gapping in comparatives has been used as evidence that comparatives should properly be treated as a form of coordination (Lechner 2004). If we adopt this view, then (i) would not weaken the claim based on (7) that *let alone* is a coordination. Even if we do not adopt Lechner's claim, though, it is still simpler to conclude that *let alone* is a form of coordination and gapping is restricted to coordination and comparatives than to claim that *let alone* is something else and gapping is restricted to those three environments.

(16) a. John won't cook, let alone Louise eat, squid with ink sauce.

b. John won't cook, or Louise eat, squid with ink sauce.

(17) a. John will cook, as well as Louise eat, squid with ink sauce.

b. John will cook, and Louise eat, squid with ink sauce.

As with gapping, there are some RNR-specific constraints; to convince ourselves that (16)a and (17)a really are RNR, it can be shown that *let alone* and *as well as* sentences that have the appearance of RNR conform to these constraints. As before, I will demonstrate with *let alone*. One such constraint has been called the Right Edge Restriction. This restriction requires that the right node raised phrase be able to sit at the right edge of each conjunct independently. For example, in (18) *that girl* could not sit at the right edge of the first conjunct, and RNR is prohibited. Similarly, the Right Edge Restriction holds of RNR with *let alone*, (19)a.

(18) *John should [give _ the book] and [congratulate _] that girl. (Wilder 1999, 595)

(19) a. *John shouldn't [give _ the book] let alone [congratulate _] that girl.

b. John shouldn't [give the book _] let alone [offer his congratulations _] to that girl.

This is just what we would expect if *let alone* is a form of coordination and can do whatever coordination can do. Though availability of RNR is not a sure-fire indication that we have coordination,[5] the availability of RNR is suggestive of coordination, especially when taken together with the CSC facts and the availability of gapping.

---

[5] An exception is what are sometimes called Hudson sentences, which do not have a coordination structure.

(i) Of the people questioned, those who liked outnumbered by two to one those who disliked the way in which the devaluation of the pound had been handled.

(ii) It's interesting to compare the people who like with the people who dislike the power of the big unions.   (Hudson 1976, 550)

2.2.3 *Let alone*, *as well as*, and stripping

Stripping (also sometimes called bare-argument ellipsis) is a third form of ellipsis involving coordination. Stripping is the name given to this phenomenon by Hankamer and Sag (1976). As they describe it, "stripping is a rule that deletes everything in a clause under identity with corresponding parts of a preceding clause, except for one constituent (and sometimes a clause initial adverb or negative)" (Hankamer and Sag 1976, 409).

(20)   a.   Alan likes to play volleyball, but not Sandy.

          b.   Gwendolyn smokes marijuana, but seldom in her own apartment.

                                            (Hankamer and Sag 1976)

One common form has the appearance of a clause conjoined with a noun phrase. The noun phrase is in the second conjunct and is understood to be the subject of a second, elided clause which is placed in contrast to the first.

(21)   Jane likes living in L.A., and Toby too.

In general, the particle *too* or *also* is needed for the sentence to be grammatical, though with heavy contrastive focus (marked with small caps), it is marginally possible to do without it.

(22)   a.   ??Jane likes living in L.A., and Toby.

          b.   ?JANE likes living in L.A. AND Toby.[6]

Many authors, including Hankamer and Sag, have argued that stripping is derived from gapping, but, again, the derivation of the process will not concern us here. Here I will simply note that stripping seems especially felicitous with *let alone* and *as well as*.

(23)   Even her best friend hasn't visited Mary in the hospital, let alone John.

---

[6] I find this sentence to be marginal at best (and then only in a marked context: *Does Jane really like living in L.A. and, more to the point, does her husband?*) but other authors seem to find them as acceptable as the versions with *too*. Merchant (2003) marks both (i) and (ii) completely grammatical.

   (i)   ABBY speaks passable Dutch, and BEN, too.

   (ii)   ABBY speaks passable Dutch, AND BEN.

(24)   Her neighbors have visited Mary in the hospital, as well as John.

In this case, as with most stripping sentences, a particular contrastive inflection is helpful. What the stripping data show us is another environment limited to coordination that allows *let alone* and *as well as*.

Thus, the ellipsis facts in 2.2 can be taken together to be strong evidence that *let alone* and *as well as* are forms of coordination. While it is true that both gapping and right node raising are possible outside of coordination (see fns. 4 and 5), the combination of the CSC restrictions with salvation by ATB-extraction and, further, the availability of gapping, right node raising, and stripping can together be taken as evidence that we are dealing with coordination.

3   Left-coordinate FSOs

Two of the FSC expressions under investigation in this chapter contain an overt *even*: *and even* and *or even*. Two contain an overt *also*: *and also* and *not only...but also*. *Also* seems to be much like *even* in some ways (it has an existence presupposition), though it differs in one respect (it has no presupposition about likelihood). The nature of these two presuppositions will be discussed in the following chapter. I will propose that *also* is identical to *even* except for the likelihood presupposition, following König (1991) who argues that *even* is the same as *too* with the addition of the scalar (likelihood) presupposition. Finally, we have *let alone* and *as well as*. Neither of these contain an overt focus particle. However, their syntactic and, as we will see, semantic behavior is very much like the other four. Therefore I propose that in those cases, there is a covert *even*, in the case of *let alone*, or *also*, in the case of *as well as*, and that the meaning of the FSC arises from a combination of this covert particle and coordination. The next two sub-sections outline my analysis of the composition of *let alone* and *as well as*.

34

3.1 *Let alone = even ... or*

Based on the meaning of sentences containing *let alone*, the coordination component seems to be disjunction, since, for example, (25)a and (25)b have virtually the same meaning.

(25) a. They haven't reached the halfway mark, let alone the finish line.

   b. They haven't reached the finish line, or even the halfway mark.

The pair in (25) also illustrate that the coordinates in a *let alone* sentence occur in the opposite order to those in an *or even* sentence. What this suggests is that whereas *even* is associated with the second coordinate in (25)b, there is an *even* component associated with the first coordinate in a *let alone* sentence. This can also be seen by spelling out the meaning of (25)a. This sentence is felicitous only *they reached the halfway mark* is the most likely of all of the salient alternative propositions. In fact, it has exactly the same meaning with *even* present in the first coordinate.

(26) a. They haven't even reached the halfway mark, let alone the finish line.

   b. They haven't reached even the halfway mark, let alone the finish line.

If the proposition in the left-hand coordinate is not the most likely of the salient alternative propositions, *let alone* cannot be used. For example, if the coordinates are reversed, the sentence is not possible under normal assumptions about the relationship between reaching the halfway mark of a race and reaching the finish line.

(27) *They haven't reached the finish line, let alone the halfway mark.

These facts can be accounted for if there is a FSO in the left-hand disjunct even in those *let alone* sentences that do not have an overt *even*. I will call this FSO covert *even*. Under this proposal (25)a can be represented as follows. For concreteness, I assume that covert *even* is adjoined to the proposition. The structure of the second coordinate (i.e., that it is a *v*P despite appearances of being a DP) will be argued for below.

(28)   They$_i$ haven't [$_{\nu P}$[$_{\nu P}$ \<even\> t$_i$ reached the halfway mark] let alone [$_{\nu P}$ t$_i$ ~~reached~~ the finish line]]]

If there is a covert *even* associated with the coordinate preceding *let alone*, then we can use a mechanism already in place in order to account for this asymmetry between the coordinates. The restriction follows from the presuppositions of *even*. A sentence p, where p is a proposition, is usually analyzed as having two semantic values, the ordinary semantic value and the focus semantic value (Rooth 1992). The focus semantic value is a set of propositions, call it C, differing from p only in the value of the focus marked constituent. *Even* contributes two presuppositions; in a downward entailing context like the c-command domain of negation, these presupposition are the following: there is some proposition in the set C other than p that is false; p is the most likely of all of the alternative propositions in C.[7]

In a sentence with *or* and *even* associated with the right-hand disjunct, like (25)b it is presupposed that the proposition denoted by the second disjunct is more likely (or less remarkable) than that denoted by the first. In a *let alone* sentence with an overt *even* adjoined to the left-hand disjunct, it will be the proposition denoted by the left-hand disjunct that is presupposed to be the most likely, accounting for the flipping of the order of disjuncts between *or even* and *let alone*. Finally, in order to account for the fact that the left-hand disjunct is also the most likely in *let alone* sentences not containing an (overt) *even*, we can hypothesize that there is an *even* there as well, but that it is not pronounced.

Let alone differs from ordinary disjunction in not being able to coordinate more than two phrases.

(29)   a.   Bill can't hum a tune, croon a ballad, or sing an opera.

       b.   *Bill can't hum a tune, croon a ballad, let alone sing an opera.

---

[7] There is much debate in the literature about whether *even* in a downward-entailing context has a different lexical entry (and different presuppositions) than *even* in contexts that are not downward-entailing. In chapter 3 I will review the literature and provide a new argument that there is an NPI *even* that is present in DE contexts. For now, I will simply assume that there is.

Suppose that *let alone* is composed of disjunction and (covert or overt) *even* is adjoined to the left-edge of the left-hand disjunct and that, furthermore, merger of *even* marks the scope of the disjunction. This would have the effect of not allowing merger of a third disjunct after the introduction of *even*.

(30) a.   [even croon a ballad] let alone [sing an opera]

      b.   *[[hum a tune] [[even croon a ballad] let alone [sing an opera]]]

(29)b is much improved with repetition of *let alone* (in which case it is necessary to place additional prosodic emphasis on the second *let alone*) or with *or* coordinating the first two disjuncts.

(31) a.   Bill can't hum a tune, let alone croon a ballad, LET ALONE sing an opera.

      b.   Bill can't hum a tune or croon a ballad, let alone sing an opera.

In these cases, the constituency will be different from (30)b, with the first two disjuncts forming a constituent. This constituent is then the one to which *even*, introduced by (the right-most) *let alone*, is adjoined.

(32) a.   [even [[even hum a tune] let alone [croon a ballad]]] LET ALONE [sing an opera]]

      b.   [even [hum a tune or croon a ballad] let alone [sing an opera]

Note that in the case of (31)a, it is not possible for both of the *evens* (one introduced by each instance of *let alone*) to be pronounced. This is possibly due to a prosodic restriction on doubling.

3.2   *As well as = also ...and*

For the most part, this work focuses on FSCs involving *even*, but I will here give a sketch of an analysis of *as well as*. This FSC contributes a conjunctive component, as evidenced by the very similar meanings of (33)a and (33)b.

(33)   a.   The children found the Easter eggs and also my lost keys.

        b.   The children found my lost keys as well as the Easter eggs.

In addition to conjunction, there seems to be another component to the meaning of *as well as*. Like *and also*, it seems to have a component of equivalent to *too*. One way to see this is that addition of *also* to the to first coordinate does not change the meaning of (33)b, though it adds something to meaning of an ordinary conjunction.

(34)   The children also found my lost keys as well as the Easter eggs.

(35)   a.   The children found my lost keys and the Easter eggs.

        b.   The children also found my lost keys, and the Easter eggs.

This can be seen more clearly with coordinations like (36), in which there is an ambiguity between a reading in which the priest married John and Sue to each other and a reading in which the priest married John and he married Sue, though not (necessarily) to each other. With the introduction of *also* into the second conjunct (37), the reading in which John and Sue were married to each other is no longer available.

(36)   Father Finnegan married John and Sue.

(37)   Father Finnegan married John and also Sue.

When the coordination is *as well as*, there is no ambiguity. The only reading is the one available for (37), suggesting that there is an *also* component there as well. Addition of *also* to the first conjunct does not change the meaning; it still has only the (37) reading.

(38)   a.   Father Finnegan married John as well as Sue.

        b.   Father Finnegan also married John as well as Sue.

Also, when overt, must be placed in the first coordinate. The counterpart of (38)b with *also* in the second coordinate is not grammatical.

(39)   *Father Finnegan married John as well as also Sue.

There is a difference between (37) and (38). The sentences are most natural in a context in which the conjunct without *also* is part of the presuppositional background. It is odd to use them in a context in which the *also*-containing coordinate is part of the context.

(40)   Speaker A: Father Finnegan married Sue.
        Speaker B: i.   He also married John as well as Sue.
                      ii.   He married Sue and also John.
                      iii.   ?*He also married Sue as well as John.
                      iv.   ?*He married John and also Sue.

This is also true of *as well as* sentences without an overt *also*, though they are perhaps slightly less odd than the responses in (40)iii and iv.

(41)   Speaker A: Father Finnegan married Sue.
        Speaker B: ??He married Sue as well as John.

A simple view of *also* that can account for these facts is that *also* introduces a presupposition that says there is some true alternative in the set C, differing only in the value of the focus-marked constituent (Karttunen and Peters 1979). For example, in the sentence (42), there is a presupposition that there is something else that the children found (i.e., some alternative proposition, differing from (42) only in *the Easter eggs*, is true).

(42)   The children also found [the Easter eggs]$_F$.

In addition, use of *also* requires that the proposition with which it is associated be new information. For this reason, Speaker B's response in the dialog in (43) is worse than simple repetition of what Speaker A said.

(43)   Speaker A: Father Finnegan married Sue.
        Speaker B: *He also married Sue.

If *as well as* always has *also* associated with the left-hand coordinate, then the fact that new information should be in the left-hand coordinate even without an overt *also* is accounted for. However, I do not have an account of why (41) is not quite as bad as (40)iii and iv, nor why both are better than (43). Since existential presuppositions are generally fairly weak presuppositions, a further investigation of the nature of the *also* presupposition might yield an explanation.

To sum up this section, I have argued that *let alone* is equivalent to disjunction with *even* associated with the first coordinate. In some cases, there is an overt *even*; in the rest, I have proposed that there is a covert *even*. Further, I have argued that *as well as* is equivalent to conjunction with *also* associated with the first coordinate, either overtly or covertly. I turn now to the distributional and syntactic properties of the class of coordinations that have a FSO adjoined to one of the coordinates, Focus Sensitive Coordination.

4   Focus Sensitive Coordination

4.1   Propositional Focus Sensitive Coordination Hypothesis

As will be shown in the next few sub-sections, FSC is possible only with propositional coordinates or coordinates that can be derived from propositional coordinates. This generalization can be captured by the following hypothesis.

(44)   Propositional Focus Sensitive Coordination Hypothesis: Focus Sensitive Coordination may only coordinate propositions.

40

According to this hypothesis, which I will argue for in this section, all FSC is coordination of propositions, even coordinations that appear to be smaller.

4.2   Small Clauses and *v*Ps

Small clauses and *v*Ps are two kinds of phrases that are propositional, and the Propositional FSC Hypothesis predicts that FSC should allow these as coordinates. I turn first to small clauses

It has been argued that a small clause is a constituent containing both a subject and a predicate (Stowell 1983). Thus, though they cannot appear on their own, lacking tense, all of the arguments of the predicate are saturated.

(45)   a.   John finds [AP Bill [absolutely crazy]].

b.   The captain allowed [PP him [into the control room]].

c.   Mary had [VP her brother [open the door]].

d.   We all feared [VP John [killed by the enemy]].   (Stowell 1983, 297)

Such clauses can be coordinated by FSC.

(46)   a.   The captain will allow John onto the deck {or even/and even/and also/as well as} Mary into the control room.

b.   The captain won't allow John onto the deck let alone Mary into the control room.

c.   The captain will not only allow John onto the deck but also Mary into the control room.

These can be given a structure in which the small clauses are coordinated by the conjunction or disjunction part of FSC, with the FSO adjoined to the left- or right-handed coordinate. I give here a ternary structure for coordination only for ease of illustration, assuming, as is standard, that it actually has a binary one.

(47)   The captain will allow [PP [PP John onto the deck] or [PP even [PP Mary into the control room]]].

This environment is one where *even* or *also* adjoins to a constituent that is propositional.

A second such case is *v*P. Based on the arguments in chapter 1, we can take T-gapping sentences to contain coordination at the *v*P level. For example, a sentence like (49)a in which the second disjunct contains a subject, non-finite verb, and object has the structure in (49)b, after reconstruction of the subject *John*.

(48) a.   John won't drink milk or Mary eat veal.

      b.   won't [$_{v\text{P}}$ [$_{v\text{P}}$ John drink milk] or [$_{v\text{P}}$ Mary eat veal]].

These phrases can also be coordinated by FSC, giving a structure like the one in (50).

(49) a.   John will drink milk {or even/and even/and also/as well as} Mary eat veal.

      b.   John won't (even) drink milk let alone Mary eat veal.

      c.   John will not only drink milk, but also Mary eat veal.

(50) John$_i$ will [$_{v\text{P}}$ [$_{v\text{P}}$ t$_i$ drink milk] or [$_{v\text{P}}$ even [$_{v\text{P}}$ Mary eat veal]]].

Thus, these two environments, which are straightforwardly propositional, allow FSC with no additional assumptions about the structure of the coordinates. More complicated cases are ones in which the coordinates appear to be smaller than propositions, to which I now turn.

4.3   Apparently smaller coordination

4.3.1   Verbal complements

Coordination by a FSC is allowed within *v*P only when the result can be derived by coordination of *v*P with an otherwise attested form of ellipsis. For example, while coordination of verbal complements is possible, coordination of smaller phrases is not. It will be seen that in these cases, the only allowed coordinations are those that can be derived by *v*P coordination followed by gapping or right node raising, under certain assumptions about these processes.

Within the complement domain of the verb, there are restrictions on what FSC may combine. Coordination of DPs that are complements of a verb is allowed.

(51) a. John might paint a chair, {or even/and even/and also/as well as} an armoire.

b. John didn't (even) paint a chair, let alone an armoire.

c. John might paint not only a chair, but also an armoire.

FSC cannot, however, combine phrases below the DP level, when a DP is selected as a complement to a verb. Thus (51) is allowed (DP coordination), but (52) is not.

(52) a. *John might paint a chair, {or even/and even/and also/as well as} armoire.

b. *John didn't (even) paint a chair, let alone armoire.

c. *John might paint not only a chair, but also armoire.

A further piece to the picture is that when the second coordinate contains a phrase that could occur on its own as a complement to the verb, *let alone* coordination is allowed even when there is no determiner. This can be seen with a mass noun like *furniture*, which is either a DP without an overt determiner or, as has been argued by Chierchia (1998), a bare NP.

(53) a. John might paint one scenic postcard, {or even/and even/and also/as well as} furniture.

b. John wouldn't (even) paint one scenic postcard, let alone furniture (...he considers himself a true fine artist).

c. John might paint not only one scenic postcard, but also furniture.

The correct characterization, then, is that FSC can have coordinates that are nominal complements (whether DPs or NPs) just so long as each phrase may independently be a complement of the verb.

The same restriction is found in gapping. While it is possible to gap the verb in the second coordinate, the verb and determiner of the object DP may not be targeted for gapping, (54).

(54)   a.   John$_i$ might [[$_{vP}$ t$_i$ paint [$_{DP}$ a chair]] or [$_{vP}$ Mary ~~paint~~ [$_{DP}$ an armoire]]]]

         b.   *John$_i$ might [[$_{vP}$ t$_i$ paint [$_{DP}$ a chair]] or [$_{vP}$ Mary ~~paint~~ [$_{DP}$ ~~an~~ armoire]]]]

If we make the assumption that (51) can have a derivation like the gapping sentence (54) followed by ATB subject movement, then we have an account of why it is possible only to coordinate complements of the verb but not phrases within the complement—only the former can be remnants of gapping. This gives us the following structures for the FSC.

(55)   a.   John$_i$ might [[$_{vP}$ t$_i$ paint [$_{DP}$ a chair]] or [$_{vP}$ even [t$_i$ ~~paint~~ [$_{DP}$ an armoire]]]]]

         b.   *John$_i$ might [[$_{vP}$ t$_i$ paint [$_{DP}$ a chair]] or [$_{vP}$ even [t$_i$ ~~paint~~ [$_{DP}$ ~~an~~ armoire]]]]]

In contrast, both kinds of coordinates are possible with corresponding ordinary coordinations, (56).

(56)   a.   John might paint a chair {or, and} an armoire.

         b.   John might paint a chair {or, and} armoire.

This tells us that the structure for (56)b, (57)a, is not available for FSC (57)b, supporting the hypothesis that non-propositional phrases may not be coordinates in FSC.

(57)   a.   John$_i$ might [$_{vP}$ t$_i$ paint [$_{DP}$ a [$_{NP}$ chair or armoire]]].

         b.   *John$_i$ might [$_{vP}$ t$_i$ paint [$_{DP}$ a [$_{NP}$ chair or even armoire]]].

Thus, the Propositional FSC Hypothesis (44), along with restrictions on the kinds of ellipsis that can apply to such a structure, account for the otherwise puzzling difference between FSC and ordinary coordination shown in (51)–(52) and (56).

44

Secondly, it is not possible to coordinate adjuncts to the complement of a verb with FSC. In the examples below, the relevant DP is an object of the matrix verb. When the Det and N heads are repeated (or replace by *the one*), the sentence is grammatical. Dropping of these heads, i.e., coordination inside the complement of the verb, is not grammatical.

(58)   a.   She could have spotted the women with the neon vests, {or even/and even/and also/as well as} the ones with the camouflaged overalls.

        b.   She couldn't see the women with the neon vests, let alone the ones with the camouflaged overalls.

        c.   She could have spotted not only the women with the neon vests, but also the ones with the camouflaged overalls.

(59)   a.   *She could have spotted the women with the neon vests, {or even/and even/and also/as well as} with the camouflaged overalls.

        b.   *She couldn't see the women with the neon vests, let alone with the camouflaged overalls.

        c.   *She could have spotted not only the women with the neon vests, but also with the camouflaged overalls.

Gapping, again, shows a similar restriction on this kind of remnant, as has been noticed by Sag (1973) and Neijt (1979). Minimal pairs to (58)–(59) are given in (61).

(60)   a.   *John saw the queen of England and Peter ~~saw the queen~~ of Holland.
                                                (Neijt 1979, 111)

        b.   *John met the vice-president of IBM, and Betsy ~~met the vice-president~~ of Xerox.   (Sag 1973, 270)

(61)   a.   John$_i$ couldn't [[$_{vP}$ t$_i$ see [the women with the neon vests]] or [$_{vP}$ Bill ~~see~~ [the ones with the camouflaged overalls]]].

        b.   *John$_i$ couldn't [[$_{vP}$ t$_i$ see [the women with the neon vests]] or [$_{vP}$ Bill ~~see~~ [~~the ones~~ with the camouflaged overalls]]].

The Propositional FSC Hypothesis gives us propositional coordination here, too, followed by gapping, on analogy with (61). The ungrammaticality of (59) then has the same explanation as (61), giving it the structure in (62).

(62) a.   She$_i$ couldn't [[$_{vP}$ t$_i$ see [the women with the neon vests]] or [$_{vP}$ even [t$_i$ ~~see~~ [the ones with the camouflaged overalls]]]]].

      b.   *She$_i$ couldn't [[$_{vP}$ t$_i$ see [the women with the neon vests]] or [$_{vP}$ even [t$_i$ see [~~the ones~~ with the camouflaged overalls]]]]].

Unlike coordination containing a FSC, *or* and *and* can coordinate phrases within the complement domain of the verb.

(63) a.   She could have seen the women with the neon vests {or/and} the ones with the camouflaged overalls.

      b.   She could have seen the women with the neon vests {or/and} with the camouflaged overalls.

This tells us that the structure for (63)b, (64)a, is not available for FSC (64)b.

(64) a.   She could have [$_{vP}$ t$_i$ seen [the women [$_{PP}$ with the neon vests or with the camouflaged overalls]]].

      b.   *She could have [$_{vP}$ t$_i$ seen [the women [$_{PP}$ with the neon vests or even with the camouflaged overalls]]].

4.3.2   Verbal adjuncts

Thirdly, verbal adjuncts may be coordinated only if the entire adjunct appears in each coordinate. For example, deleting the *if* of an *if*-clause in the second coordinate results in ungrammaticality with all FSCs.

(65) a.   He would give you his piano if you bought him a house, {or even/and even/and also/as well as} if you (just) gave him $100.

      b.   He wouldn't give you his piano if you bought him a house, let alone if you gave him $100.

c. He would give you his piano not only if you bought him a house, but also if you (just) gave him $100.

(66) a. *He would give you his piano if you bought him a house, {or even/and even/as well as} you (just) gave him $100.

b. *He wouldn't give you his piano if you bought him a house, let alone you gave him $100.

c. *He would give you his piano not only if you bought him a house, but also you (just) gave him $100.

Gapping likewise cannot target *if* in this environment.

(67) a. John$_i$ would [[$_{vP}$ t$_i$ give you his piano [if you bought him a house]], and [$_{vP}$ Mary ~~would give you her piano~~ [if you gave her $100]]].

b. * John$_i$ would [[$_{vP}$ t$_i$ give you his piano [if you bought him a house]], and [$_{vP}$ Mary ~~would give you her piano [if~~ you gave her $100]]].

On analogy with (67), we have (68) as the structures for the propositional FSCs.

(68) a. John$_i$ would [[$_{vP}$ t$_i$ give you his piano [if you bought him a house]], and [$_{vP}$ even [t$_i$ ~~would give you her piano~~ [if you gave her $100]]]].

b. * John$_i$ would [[$_{vP}$ t$_i$ give you his piano [if you bought him a house]], and [$_{vP}$ even [t$_i$ ~~would give you her piano [if~~ you gave her $100]]]].

Both environments are possible with ordinary conjunction and disjunction.

(69) a. He would give you his piano if you bought him a house, {and/or} if you gave him $100.

b. He would give you his piano if you bought him a house, {and/or} you gave him $100.

This tells us that the structure for (69)b, (70)a, is not available for FSC (70)b.

(70) a. He would give you his piano [if [you bought him a house or you gave him $100]].

b. *He would give you his piano [if [you bought him a house or even you gave him $100]].[8]

Coordination of non-propositional phrases inside of an adjunct is also possible—under the same conditions as in the matrix clause: if it can be derived from propositional coordination, it is allowed; otherwise it is out. The examples here are given for *or even*, but the same generalization holds of the others.

(71) a. John would give you his piano if [you$_i$ [$_{vP}$ t$_i$ gave him $1000] or [$_{vP}$ even [t$_i$ ~~gave him~~ $100]]]

b. John would give you his piano if Jack gave him $1000 or Jill $100.

(72) a. *John would give you his piano if [you$_i$ [$_{vP}$ t$_i$ gave him a new house] or [$_{vP}$ even [t$_i$ ~~gave him a new~~ car]]

b. *John would give you his piano if Jack gave him a new house or Jill car.

Thus, as with *let alone*, FSC is possible within the *v*P domain only if there is a derivation that allows it to be derived from propositional coordination.

4.3.3 VPs

FSC can combine two verb phrases that share a subject.

(73) a. John will drink milk {or even/and even/and also/as well as} eat veal

b. John won't (even) drink milk, let alone eat veal.

c. John will not only drink milk, but also eat veal.

It can be assumed that these sentences contain coordination of two *v*Ps followed by Across-the-Board (ATB) movement of the subject *John*.

---

[8] The example in (i) is possible, if focus is on the subject. As we will see, in that case *even* is not adjoined to the right-hand coordinate, but rather to the subject of it. I will investigate this kind of case in section 5 of this chapter, but leave it aside for now.

(i)   He would sell his piano [if [Jack gave him $1000 {or/and} even Jill$_F$ gave him $100]].
See section 3.5.1 for the interaction of focus and TP-coordination.

48

(74)   [$_{TP}$ John$_i$ won't [$_{vP}$ [$_{vP}$ t$_i$ drink milk] let alone [$_{vP}$ t$_i$ eat veal]]].

Thus, this environment can be considered to be a subset of the vP-coordination environments discussed in section 4.2.

There is some variation in whether it is possible to combine finite VPs by FSCs. There is more speaker variation with certain FSCs than with others. I will discuss *let alone* since that expression seems to have a sharper contrast than the others. In my judgment (and that of some of the other speakers I consulted), the sentences in (75) with finite VPs are as grammatical as those in (76).

(75)   a.   Peter never calls his mother, let alone makes a fuss on her birthday.

        b.   In that family, the father never cooks dinner, let alone washes the pots and
              pans.

(76)   a.   Peter doesn't call his mother, let alone make a fuss on her birthday.

        b.   In that family, the father won't cook dinner, let alone wash the pots and
              pans.

For at least some speakers, though, (75)a and b are considerably worse than (76)a and b. I do not have a good account of this variation, though one suggestion is that speakers who find (75) ungrammatical are analyzing these sentences as coordinations of large conjuncts—in which the coordinates are large enough to contain the tense- and aspect-related functional heads. That is, maybe for them (75) is similar to coordination of full TPs (77), which are judged by both groups of speakers to be ungrammatical (for reasons to be discussed below).

(77)   *Peter never calls his mother, let alone John makes a fuss on Mother's Day.

If the sentences in (75) also had these larger coordinates, then their ungrammaticality would have the same explanation as the ungrammaticality of TP-coordination. The speakers for whom (75) is fine are presumably assigning a small-coordinate structure to those sentences. That is, the tense features on the verbs are checked off by a single tense

head (similarly for aspect) that c-commands both coordinates. This would amount to a kind of ATB feature checking.

4.4   Small clauses revisited

Previously, small clauses were given as an example of propositional coordination, (46), repeated as (78).

(78)   a.   The captain will allow John onto the deck {or even/and even/and also/as well as} Mary into the control room.

   b.   The captain won't allow John onto the deck let alone Mary into the control room.

   c.   The captain will not only allow John onto the deck but also Mary into the control room.

Now that we have seen that complements to a verb can be coordinated with FSC of *v*Ps followed by verb gapping and ATB-subject movement, these examples should be revisited. Since the small clauses are themselves complements of the matrix verb, we want to see whether we in fact have coordination of small clauses in these cases or instead coordination of *v*Ps. That is, does (78) have the structure in (79)a (small clause coordination) or (79)b (*v*P coordination)?

(79)   a.   The captain will allow [[$_{PP}$ John onto the deck] and [$_{PP}$ even [Mary into the control room]]].

   b.   [The captain]$_i$ will [[$_{vP}$ t$_i$ allow [$_{PP}$ John onto the deck]] and [$_{vP}$ even [t$_i$ ~~allow~~ [$_{PP}$ Mary into the control room]]]].

Unlike in the case of DP-complements, small clause complements cannot be targeted by gapping.

(80)   *[The captain]$_i$ will [[$_{vP}$ t$_i$ allow [$_{PP}$ John onto the deck]] and [$_{vP}$ the first mate ~~allow~~ [$_{PP}$ Mary into the control room]]].

Thus, propositional coordination followed by gapping is not available for (78), since gapping is not possible in this environment. FSC of small clauses, then, indeed has the structure proposed above, corresponding to (79)a.

4.5   Other categories

4.5.1   TPs

Another category to consider is TP. FSC of TP is not possible when the FSO is *even*, though this fact is obscured by an unrelated phenomenon in sentences with *even*. When the FSO is *also*, there is no such restriction. This distinction follows from a difference between *even* and *also* in their ability to take a TP as an argument. I will thus divide my discussion here into two parts. First I will discuss *or even*, *and even*, and *let alone*. Then I will turn to *and also*, *not only...but also*, and *as well as*.

A generalization due to Anderson (1972) is that *even* may only precede an entire clause if focus is on the first constituent, usually the subject.[9] For example, take the following examples from Jackendoff (1972). When *even* precedes *John*, focus on any constituent other than *John* is ungrammatical.

(81) a.   Even John$_F$ gave his daughter a new bicycle.

b.   *Even John gave$_F$ his daughter a new bicycle.

c.   *Even John gave his$_F$ daughter a new bicycle.

d.   *Even John gave his daughter$_F$ a new bicycle.

e.   *Even John gave his daughter a new$_F$ bicycle.

f.   *Even John gave his daughter a new bicycle$_F$.   (Jackendoff 1972, 248)

When *even* is found inside of the TP, there is no such restriction.

(82) a.   John$_F$ even gave his daughter a new bicycle.

b.   John even gave$_{(F)}$ his$_{(F)}$ daughter$_{(F)}$ a new$_{(F)}$ bicycle$_{(F)}$.

---

[9] David Pesetsky reminds me that it the first constituent, not the subject, that is relevant here. With a topicalized adjunct, only that phrase and not the subject may bear the focus when *even* precedes the TP.

(i)   Even [on Friday]$_F$ John gave his daughter a new bicycle.

(ii)   *Even on Friday John$_F$ gave his daughter a new bicycle.

Note that these examples do not involve coordination. They will however, be important to keep in mind when we look at FSC of TPs. I have claimed thus far that *even* can only take a propositional argument. What these data show us is that it is also possible for *even* to take a DP argument. I will return to the implications of this fact for my approach below. For now, suffice it to say that, unless *even* forms a constituent with the first phrase in the TP, it may not precede a TP. That is, *even* may not take a TP as an argument.

We see the effects of Anderson's generalization in FSC when the FSO is *even*. Except in those cases where focus is on the first constituent (indicating a constituency in which *even* adjoins to that constituent, rather than to the entire coordinate), TP-coordination is not possible with *even* at the edge of a coordinate. (83) shows that *even* may precede a coordinate, when associated with the immediately following subject.

(83)　a.　Everyone gave their daughters some form of transportation, and even John$_F$ gave his daughter a new bicycle.

　　　　Everyone else's father bought them a bike. Where did Sue get hers?
　　b.　Sue's grandmother gave her a new bicycle, or even John$_F$ gave his daughter a new bicycle.

(84)–(85) show that with focus inside of the TP-coordinate, however, coordination by *and even* or *or even* is not possible. The sentences in (84) are not entirely minimal, since giving someone more than one bicycle seems improbable. I have given slightly less minimal examples to provide more plausible sentences. Even with this precaution, it is not grammatical to place the focus anywhere other than the subject immediately following *and even*.

(84)　a.　*Bill lent his daughter a new skateboard, and even John gave$_F$ his daughter a new bicycle.

　　b.　* Bill gave his son a new bicycle, and even John gave his daughter$_F$ a new bicycle.

　　c.　* Bill gave his son an old bicycle, and even John gave his daughter a new$_F$ bicycle.

　　d.　* Bill gave his daughter a new skateboard, and even John gave his daughter a new bicycle$_F$.

The same can be shown for *or even*. In this case, a plausible context in which the sentences in (85) might be used would be to express an uncertainty about which of two situations occurred, which would be suggested by following the sentences with *...but I don't know which*. However, as with *and even*, these sentences with focus inside the second TP-coordinate is not grammatical.

(85)   a.   * Bill lent his daughter a new bicycle, or even John gave$_F$ his daughter a new bicycle.

   b.   * Bill gave his son a new bicycle, or even John gave his daughter$_F$ a new bicycle.

   c.   * Bill gave his daughter an old bicycle, or even John gave his daughter a new$_F$ bicycle.

   d.   *Bill gave his daughter a new skateboard, or even John gave$_F$ his daughter a new bicycle$_F$.

Similar facts hold for coordination of embedded TPs.

(86)   a.   The coach said that Michael Phelps will probably win a medal, and even [Ryan Lochte]$_F$ might ~~win a medal~~.

   b.   The coach said that Michael Phelps will probably win the gold, or even [Ryan Lochte]$_F$ might ~~win the gold~~.

(87)   a.   *The coach said that Michael Phelps will probably win the gold for the 400-meter, and even he might win the gold for the [100-meter]$_F$.

   b.   *The coach said that Michael Phelps will probably win the gold for the 400-meter, or even he might win the gold for the [100-meter]$_F$.

TP-coordination with subject focus is most natural when there is also VP-ellipsis in the second coordinate, as (88) shows. This is likely the case because there are fewer constituents in the second coordinate to bear focus, making subject focus one of only two options.

(88) a.   The neighbors each gave their daughters some form of transportation, and even John$_F$ did.

          Everyone else's father bought them a bike. Where did Sue get hers?

      b.   Sue's grandmother gave her a new bicycle, or even John$_F$ did.

It is also possible to set up a sentence with VP-ellipsis in which the auxiliary bears focus, but those are ungrammatical, like (84)–(85).

(89)   *Mary gave her daughter a bicycle, {and even/or even} John will$_F$.

      With *let alone*, the third FSC that I argue has *even* adjoined to one of the coordinates, TP coordination is likewise prohibited. Whether there is an overt *even* in the first coordinate or not, the sentences are ungrammatical, regardless of the placement of focus.

(90) a.   *(Even) Bill didn't give his daughter a new bicycle, let alone John$_F$ gave his daughter a new bicycle.

      b.   *(Even) Bill didn't lend his daughter a new skateboard, let alone John gave$_F$ his daughter a new bicycle.

      c.   *(Even) Bill didn't give his son a new bicycle, let alone John gave his daughter$_F$ a new bicycle.

      d.   *(Even) Bill didn't give his daughter an old bicycle, let alone John gave his daughter a new$_F$ bicycle.

      e.   *(Even) Bill didn't give his daughter an old skateboard, let alone John gave his daughter a new bicycle$_F$.

This is also the case when the second coordinate has undergone VP-ellipsis.

(91) a.   *(Even) Bill didn't give his daughter a new bicycle, let alone John did.

      b.   *(Even) Bill didn't give his daughter a new bicycle, let alone John didn't.

I have argued that all sentences with *let alone* have *even* adjoined to the left-edge of the left-hand coordinate (either overtly or covertly). If this is correct, then we can see why

subject focus makes no difference to FSC with *let alone*. In the case of *or even* and *and even*, subject focus allows *even* to adjoin to the subject DP, and it receives the same treatment as in the Anderson sentences. With *even* in the left-hand coordinate, though, structures like (90)–(91) force the coordinates to be at least TP-sized.

It seems that TPs are not phrases of the right type to be arguments of *even*. One way to look at this is that, whatever type it is that is shared by small clauses and *v*Ps, it is probably not the same type that TPs have. Though we might want to call all three kinds of these phrases propositions due to having saturated predicates, TPs, perhaps by virtue of the semantic effects of tense and aspect, are probably not treated the same by the semantics. A further investigation of precisely what type should be assigned to small clauses/*v*Ps on the one hand and TPs on the other is needed. I am not able to pursue this investigation here, but will leave it for future research.

Turning now to other FSCs, we see that *and also* and *not only...but also* do not have any focus-related restriction on TP-coordination.

(92)   a.   Bill gave his daughter a new bicycle, and also John$_F$ gave his daughter a new bicycle.

        b.   Bill lent his daughter a new skateboard, and also John gave$_F$ his daughter a new bicycle.

        c.   Bill gave his son a new bicycle, and also John gave his daughter$_F$ a new bicycle.

        d.   Bill gave his daughter an old skateboard, and also John gave his daughter a new$_F$ bicycle.

        e.   Bill gave his daughter an new skateboard, and also John gave his daughter a new bicycle$_F$.

(93)   a.   Not only did Bill give his daughter a new bicycle, but also John$_F$ gave his daughter a new bicycle.

        b.   Not only did Bill lend his daughter a new skateboard, but also John gave$_F$ his daughter a new bicycle.

        c.   Not only did Bill give his son a new bicycle, but also John gave his daughter$_F$ a new bicycle.

        d.   Not only did Bill give his daughter an old skateboard, but also John gave his daughter a new$_F$ bicycle.

e.   Not only did Bill give his daughter an new skateboard, but also John gave his daughter a new bicycle_F.

In fact, as long as there is a plausible context, we can use these two FSC to coordinate any two TPs, even without any focal contrast between them.

(94)   a.   It was raining on Monday, and also John bought his daughter a new bicycle.

       b.   Not only was it raining on Monday, but also John bought his daughter a new bicycle.

This is expected since the Anderson restriction on *even* does not apply to *also*. Focus can be on any of the words marked (F) (though not, of course, all at the same time).

(95)   Also John_(F) gave_(F) his_(F) daughter_(F) a new_(F) bicycle_(F).

Coordinated embedded TPs are likewise permitted, regardless of focus.

(96)   a.   The coach said that Michael Phelps will probably win a medal, and also [Ryan Lochte]_F might ~~win a medal~~.

       b.   The coach said that not only will Michael Phelps probably win a medal, but also [Ryan Lochte]_F might ~~win a medal~~.

(97)   a.   The coach said that Michael Phelps will probably win the gold for the 400-meter, and also he might win the gold for the [100-meter]_F.

       b.   The coach said that not only will Michael Phelps win the gold for the 400-meter, but also he might win the gold for the [100-meter]_F.

Here, then, are two FSCs that can be seen to straightforwardly to coordinate TPs.

The remaining FSC, *as well as*, patterns like *let alone*. It cannot coordinate TPs, regardless of where focus is placed.

(98)   a.   *Bill gave his daughter a new bicycle, as well as John_F gave his daughter a new bicycle.

b.   *Bill lent his daughter a new skateboard, as well as John gave$_F$ his daughter a new bicycle.

c.   *Bill gave his son a new bicycle, as well as John gave his daughter$_F$ a new bicycle.

d.   *Bill didn't give his daughter an old bicycle, let alone John gave his daughter a new$_F$ bicycle.

e.   *Bill didn't give his daughter an old skateboard, let alone John gave his daughter a new bicycle$_F$.

VP-ellipsis makes this especially clear.

(99)   *Bill bought his daughter a new bicycle, as well as John did.

In fact, Fiengo (1974) has made a similar observation about these two expressions (assuming that *let alone* is basically equivalent to *not to mention*, as seems reasonable). Fiengo (1974) shows that it is not possible to coordinate full tensed clauses (in contrast to coordination with *and*), though it is possible to do so with the verb deleted in the second coordinate (i.e., gapped).[10]

(100) a.   *Baskerville knew Franklin, not to mention Chaucer knew Caxton.

       b.   *Baskerville knew Franklin, as well as Chaucer knew Caxton.

       c.   Baskerville knew Franklin, and Chaucer knew Caxton.

(Fiengo 1974, 126)

(101) a.   Baskerville knew Franklin, not to mention Chaucer Caxton.

       b.   Baskerville knew Franklin, as well as Chaucer Caxton.

(Fiengo 1974, 126)

---

[10] He observes that this pattern holds for a third conjunction-like element: *not*. I do not yet know how *not* would be analyzed as a FSC.

(i)   a.   *Baskerville knew Franklin, not Chaucer knew Caxton.
       b.   Baskerville knew Franklin, not Chaucer Caxton.   (Fiengo 1974, 126)

I do not have an account that extends the treatment of *let alone* in this respect to *as well as*, since my analysis of *let alone* and TP-coordinate assimilates it to the analysis of other FSCs containing *even*. This behavior of *as well as* remains puzzling at this time.

4.5.2 CPs

A final category to consider is CP. Like other verbal complements, a CP complement can be coordinated by FSC. It is not, however, possible to distinguish between a DP-complement-like parse where the entire *v*P is coordinated, followed by gapping, and a small clause-like parse where coordination below the *v* is possible. Consider the interrogative complements to *know* below.

(102) a.   Jane might know when he went to New York {or even/and even/and also/as well as} whether he stayed in a hotel.

     b.   Jane doesn't know when he went to New York, let alone whether he stayed in a hotel.

     c.   Jane might not only know when he went to New York but also whether he stayed in a hotel.

The two possible structures are given in (103) and (**Error! Reference source not found.**.

(103) a.   Jane might know [[$_{CP}$ when he went to New York] and [$_{CP}$ even [whether he stayed in a hotel]]].

     b.   Jane$_i$ might [[$_{vP}$ t$_i$ know [$_{CP}$ when he went to New York]] and [$_{vP}$ even [t$_i$ ~~know~~ [$_{CP}$whether he stayed in a hotel]]]].

Notice that gapping is possible in this environment, showing that (**Error! Reference source not found.** is an available structure.

(104)   Jane$_i$ might [[$_{vP}$ t$_i$ know [$_{CP}$ when he went to New York]] and [$_{vP}$ even [Sue ~~know~~ [$_{CP}$ whether he stayed in a hotel]]]].

Non-interrogative CP complements also have two possible structures. Take the CPs below consisting of *that*-clauses.

(105) a.   Jane might know that he went to New York {and even/or even/and also/as well as} that he stayed in a hotel.

      b.   Jane doesn't know that he went to New York, let alone that he stayed in a hotel.

      c.   Jane knows not only that he went to New York, but also that he stayed in a hotel.

(106) a.   Jane might know [[$_{CP}$ that he went to New York] and [$_{CP}$ even [that he stayed in a hotel]]].

      b.   Jane$_i$ might [[$_{vP}$ t$_i$ know [$_{CP}$ that he went to New York]] and [$_{vP}$ even [t$_i$ ~~know~~ [$_{CP}$ that he stayed in a hotel]]]].

Since gapping is available in this environment, (107), (106)b is a viable structure for (105)a. The question now is whether (103)a and (106)a are also possible structures, i.e., whether (apparently) coordinated CPs are ambiguous between a vP-coordination structure with gapping and a CP-coordination structure. If (103)a and (106)a are available, CPs would be like small clauses in their ability to be coordinated directly by FSC, but unlike them in that the vP-coordination structure is also available.

(107)   Jane$_i$ might [[$_{vP}$ t$_i$ know [$_{CP}$ that he went to New York]] and [$_{vP}$ even [Sue ~~know~~ [$_{CP}$ that he stayed in a hotel]]]].

One reason to think that we are dealing with the larger coordinates, however, is that full, interrogative CPs may not be coordinated by FSC.

(108)   *[[$_{CP}$ Why did he go to New York] and [$_{CP}$ even [when did he go there]]]?

Since it is already necessary to restrict the kinds of phrases to which *even* can adjoin so as to include small clauses and vPs and exclude TPs, it seems likely that however we restrict possible arguments of *even*, CPs will not end up being of the same type as the small clauses and vPs.[11] Based on the ungrammaticality of (108) and the availability of gapping

---

[11] I am grateful to Kyle Johnson (p.c.) for making this point to me. I will pursue this suggestion in future work.

in environments like (104) and (107), the apparent FSC of CPs seems to be another case of *v*P coordination followed by verb gapping and ATB subject movement.

5 *Even* phrases as generalized quantifiers

Thus far, we have looked at sentences in which *even* is adjoined to a proposition. As we saw in section 4.5.1, however, *even* can also adjoin to a noun phrase. For example, even though *even* cannot adjoin to a TP, as shown by its inability to associate with any but the first constituent in a TP, it can associate with the subject of the TP in (109). This contrast can be explained if in (109) *even* is adjoined not to the TP but to its DP subject. In the case of association with the first constituent, I propose that *even* is acting as a quantificational determiner so that the constituent formed by *even* and the noun phase is a generalized quantifier.[12]

(109) a.   Even John$_F$ gave his daughter a new bicycle.

b.   *Even John gave$_{(F)}$ his daughter$_{(F)}$ a new$_{(F)}$ bicycle$_{(F)}$.

Generalized quantifiers can undergo movement, and the environment of coordination allows us to investigate how *even* as a generalized quantifier behaves relative to the Coordinate Structure Constraint.

It has been noticed by Fauconnier (1975) that *even* cannot escape a coordination island. This can be reformulated to state that the generalized quantifier [*even* NP] cannot escape the coordination island. He gives the following example:

(110) a.   Mrs. Crabtree would let even John elope with her daughter.

b.   *Mrs. Crabtree would let her daughter and even John elope.

(Fauconnier 1975, 365)

When it is not inside of a coordination, *even* is perfectly grammatical associated with the direct object *John*, as (110)a shows. It is not possible to have *even* inside of a

---

[12] This was suggested to me by Danny Fox and Irene Heim (p.c.).

conjunction, though, as seen in (110)b. This example is telling, especially when we contrast it to the grammatical (111).

(111)   Mrs. Crabtree would let her daughter and even her son elope.

When we interpret the two, conjoined DPs as being jointly prohibited from eloping (110)b, the sentence is ungrammatical. When we interpret them as being independently prohibited from eloping (i.e., Mrs. Crabtree would let either elope with some unnamed lover), the sentence is fine.

We can account for the difference between (110)b and (111) by giving a propositional coordination structure to (111). This case but not the former can be analyzed as having a VP-conjunction structure, with subsequent ellipsis.

(112)   Mrs. Crabtree$_i$ would [$_{vP}$ t$_i$ let [her daughter ~~elope~~]] [and [$_{vP}$ even$_i$ [$_{vP}$ t$_i$ ~~let~~ [t$_i$ her son elope]]].

In this structure, *even* is adjoined to the second *v*P and still stays inside of the conjunction. On the interpretation where *her daughter* and *John* are prohibited from eloping together, this structure would not be possible (indeed, (110)b becomes perfectly acceptable if it is understood to prohibit two separate elopements). The only structure for that coordination is this one:

(113)   Mrs. Crabtree would [$_{VP}$ let [[$_{DP}$ her daughter and even John] elope]].

Now, why should (113) be prohibited? Suppose that in order to generate alternatives to the sentence of the relevant form, i.e., *Mrs. Crabtree would let her daughter and x elope*, the generalized quantifier (GQ) *even John* must move out of the coordinated subject of the small clause. If it does so, however, the resulting structure is one in which the GQ binds a trace in one of the coordinates but not in the other. Such a structure suffers from vacuous quantification and thus violates the Fox-Ruys version of the Coordinate Structure Constraint (see overview in chap.1). So the ungrammaticality of (110)b is a result of the conflict between two requirements: the GQ must undergo QR in

order to generate alternatives (because of the presuppositional requirements of *even*); and the CSC prohibits movement out of the coordination.[13]

Is there independent evidence for this restriction of movement of the *even*-phrase? If the movement is properly thought of as QR, then there is. It has been argued that QR obeys the CSC (Lakoff 1970; May 1985; Ruys 1992). For example, in (114), with no coordinate structure, there are two possible scope orders: there is some professor who admires every student (*some > every*); and for every student, there is some professor who admires him/her (*every > some*). On the other hand, while (115) can be paraphrased as there is some professor who admires every student and despises the dean (*some > every*), it cannot be paraphrased as for every student there is some professor who admires him/her and despises the dean (**every > some*).

(114)   Some professor admires every student.

(115)   Some professor admires every student and despises the dean.   (May 1985, 95)

The reason for this is that in order to get the inverse scope reading, *every student* would have to QR over *some professor*, moving out of the coordinate structure. Such a movement is a violation of the CSC, assuming that it applies to QR as well as to overt movements. Since there is movement out of, and variable binding into, only one of the coordinates, the structure violates the prohibition against vacuous quantification.

Fox (1996) has observed a contrast similar to (110)b–(111) in Antecedent Contained Deletion (ACD) within coordination. ACD resolution is widely thought to involve QR (May 1985; Larson and May 1990); under this view, (116)b has an LF in which the quantifier phrase containing the ACD, *every man you did*, has undergone QR to adjoin outside of the antecedent verb phrase (116)a.

---

[13] Kyle Johnson (p.c.) points out that the CSC, under the Fox-Ruys formulation, is only helpful in ruling out this case if the relevant movement creates a quantificational structure. A conceivable alternative movement—of *even* on its own rather than of the generalized quantifier—is not expected to create a quantificational structure of the kind accounted for by the Fox-Ruys analysis. That is, movement of *even* on its own out of only one coordinate would not violate the prohibition on vacuous binding, since such movement would not set up a variable binding structure and thus could not be constrained by the CSC on its present formulation.

(116) a.   I saw every man you did <saw>.

       b.   [every man you did <saw>]$_x$ [I saw x]

In some environments it appears that the CSC can be violated in order for ACD to be resolved. One such example is (117), which is grammatical, despite containing ACD in one of the conjuncts. If we assume that ACD resolution here requires QR of *the man Bill did* to a position above the verb phrase, then it appears that the QR is able to violate the CSC.

(117)   John bought a picture of the man Bill did and the woman from Canada.

                                                                              (Fox 1996)

Fox (1996) proposes that examples like these actually do not violate the CSC. Instead, he suggests that these examples should be analyzed as coordination of two TPs, followed by conjunction reduction. Under this analysis, (117) would have a structure like the one in (118)a, which would allow for QR of *the man Bill did* to take place within the first conjunct only (118)b, thus not violating the CSC.

(118) a.   [John bought a picture of the man Bill did] and
             [~~John bought a picture of~~ the woman from Canada]]

       b.   [[[the man Bill did <bought a picture of>]$_x$ John bought a picture of x] &
             [John bought a picture of the woman from Canada].

Evidence for this proposal is that the above (apparent) obviation of CSC is only possible when there is a conjunction reduction analysis of the coordination available. Within a coordination where conjunction reduction is not available, ACD is not possible. One example of this is (119). If this sentence were derived from coordination of two TPs, each of those TPs would have a singular argument for *introduce* (120). Since *introduce* requires a plural complement, such a structure is ruled out. Thus, the ungrammaticality of (119) can be accounted for if QR of *the man you did* cannot escape from the coordination without violating the CSC.

(119) *I introduced the man you did and the woman from Canada.   (Fox 1996)

(120) *[I introduced the man you did] and [I introduced the woman from Canada].

In contrast, when the coordinates in the complement of *introduce* are plural, a conjunction reduction analysis is possible. To see this, first take an example without ACD.

(121) I introduced the men from Mexico and the women from Canada.

(122) a.   I introduced [$_{DP}$[$_{DP}$ the men from Mexico] and [$_{DP}$ the women from Canada]].

       b.   [$_{TP}$[$_{TP}$I introduced the men from Mexico] and [$_{TP}$ I introduced the women from Canada]].

The sentence in (121) is ambiguous between a meaning in which the men were introduced to the women and the women to the men, which we can give a DP-conjunction structure (122)a, and a meaning in which the men were introduced to the other men and the women were introduced to the other women, which we can give a TP-conjunction structure with conjunction reduction in the second conjunct (122)b. When the first conjunct contains ACD, however, the DP-conjunction reading is no longer available.

(123) I introduced [the men you did] and [the women from Canada].   (Fox 1996)

This sentence does not have a reading in which the men and women are introduced to each other. These facts together can be taken as evidence that QR for the purposes of ACD resolution may not violate the CSC. Thus, we have evidence from QR of a different kind of phrase whose behavior closely parallels that of *even*: QR in a coordination is possible only if there is a position within the coordination that satisfies the requirements of the movement.

Chapter 3: Semantics of Focus Sensitive Coordination

1   Introduction

This chapter investigates the semantics of Focus Sensitive Coordination (FSC). In particular, it looks at the behavior of Focus Sensitive Operators (FSOs) such as *even* when they occur inside of a coordination.

It has been observed that sentences containing *even* and negation are ambiguous. Two kinds of approaches have been proposed to account for this ambiguity. The first approach, which we can call the scope theory of *even*, argues that *even* undergoes a movement similar to Quantifier Raising (QR) and the reading you get depends on where it adjoins (Karttunen and Peters 1979; Kay 1990; Wilkinson 1996; Guerzoni 2003). The second approach, which we can call the lexical ambiguity theory of *even*, accounts for the ambiguity with two different lexical entries for *even* (Rooth 1985; von Stechow 1991; Rullmann 1997). There are arguments in the literature for both accounts. I will show that the scope theory cannot account for the data on FSC.

The scope theory requires movement in order to achieve one of the readings in sentence with *even* and negation. If what I have argued in the previous chapter—that *even*, when adjoined to a proposition, can never move—movement should be impossible. For a different reason, when *even* and a noun phrase form a generalized quantifier, the movement required by the scope theory should likewise be impossible. In this case, it would require movement of the generalized quantifier out of a coordinate structure, violating the Coordinate Structure Constraint. Therefore, both configurations should disallow movement in a Focus Sensitive Coordination.

Even if such movements were possible, however, it will be shown that the scope theory cannot account for the facts with *even* inside of a coordination. On the other hand, the lexical ambiguity theory of *even* can account for the new facts. Furthermore it does so by deriving both readings with *even* remaining *in situ*, thus positing no problematic movement out of a coordination. Focus Sensitive Coordination thus provides a new argument against the scope theory and in favor of the lexical ambiguity theory.

2 *Even*

A widely adopted treatment of the word *even* takes there to be two presuppositions associated with it, an existential one and a scalar one. (Karttunen and Peters 1979).[1] Though *even* can be associated with various categories, Karttunen and Peters take the existential and scalar presuppositions (conventional implicatures in their terms) to be calculated based on *even* taking a proposition in its scope, regardless of the category it is associated with on the surface. We can call this the prejacent proposition. For example, under this view the prejacent proposition to *even* in (1) is *Amanda will eat eel*, and if *eel* is focused the presuppositions of (1) will be (2)a (existential) and (2)b (scalar).

(1)   Amanda will even eat eel.

(2)   a.   There is something other than eel that Amanda will eat.

   b.   Of everything under consideration, eel is the least likely thing for Amanda to eat.

To formalize the definition of *even* that will give these results, we have (3).[2] The term C is a set of alternatives which are identical to p except for the value of the constituent that is focused, a subset of Rooth's focus value (Rooth 1985, 1992).

(3) $[\![\text{even}]\!](C) = \lambda p \, \lambda w: \exists q \in C \, [(q \neq p) \, \& \, q(w) = 1] \text{ and } \forall q \in C \, [q \geq_{\text{likelihood}} p]. \, p(w)$

By the entry in (3) *even* is a function over propositions. It returns the value of its argument (i.e., it is the identity function) just as long as two conditions (the presuppositions) are met. First, that there is at least one proposition in the contextual set of alternatives C, that is distinct from p and that is true. Secondly, that of all alternative propositions in C, p is the least likely.

To take the example in (1), if *eel* is focused, contextual alternatives might be:

---

[1] I follow Rooth (1985), Rullmann (1997), Guerzoni (2003), and others in treating the non-truth conditional contributions of *even* as presuppositions rather than conventional implicatures as Karttunen and Peters do.

[2] I adopt the notation of Heim and Kratzer (1998) where presuppositions (as part of the domain condition of a function) are placed after the lambda term, between the colon and the period.

(4)   {Amanda will eat eel, Amanda will eat blue fish, Amanda will eat salmon, Amanda will eat fish sticks, ...}

(1) will be defined if at least one other proposition in the context set is true and if the proposition that Amanda will eat eel is less likely than any of the other propositions in that set. If instead the entire VP is focused, the alternative set might be (5). In this case the presuppositions will be not (2) but (6).

(5)   {Amanda will eat eel, Amanda will eat tofu, Amanda will go home without dinner, Amanda will give a speech about vegetarianism, ...}

(6)   a.   There is something other than eating eel that Amanda will do.

        b.   Of every property under consideration, eating eel is the least likely thing for Amanda to do.

We could also focus *Amanda*, which would give a set of alternatives varying in who will eat eel. The point here is that there are several constituents in this sentence that could be focused, each of which would yield different presuppositions. Under this approach, the variation of presuppositions corresponding to focus on different constituents is accounted for in the way the contextual parameter C is constructed. Regardless of the presuppositions, though, the sentence will assert (7) in all cases.

(7)   Amanda will eat eel.

3   Background on *even* and negation

Once we introduce negation, the picture gets more complicated. Take the sentence in (8), with focus on *fish sticks*, as indicated with a subscripted F. If negation has wide scope and we use the definition for *even* in (3), then we get the wrong meaning; as first pointed out by Horn (1969), (8) is not the negation of (9).[3]

---

[3] In general, when *even* and negation are in the same clause it is very difficult to get the narrow scope reading, i.e., a reading of (8) in which it has the same presuppositions as (9). On either theory, this is puzzling. If such a reading is available here (and there are at least some sentences where it seems to be available, see Karttunen and Peters 1979; Hoeksema and Zwarts 1991; Wilkinson 1996), we might say that *even* is a positive polarity item (PPI) on the scope theory and that the non-NPI *even* is a PPI on the ambiguity theory.

(8)   Amanda won't even eat [fish sticks]$_F$.

(9)   Amanda will even eat [fish sticks]$_F$.

With the same definition for *even* and wide scope for negation (schematized in (10)a), the presuppositions should be that there is something other than fish sticks that Amanda will eat and that, of everything under consideration, fish sticks are the least likely thing for Amanda to eat. That is, the presuppositions of (8) are predicted to be the same as those for (9).[4] Neither of the presuppositions corresponds with our intuitions about the negated sentence.

(10)   a.   not [[even] [Amanda will eat [fish sticks]$_F$]].

        b.   *presuppositions*
                i.   #There is something other than fish sticks that Amanda will eat.[5]

                ii.   #Of everything under consideration, fish sticks are the least likely thing for Amanda to eat.

        c.   *asserts*
                Amanda won't eat fish sticks.

Instead, intuitively we want the presuppositions to be that there is something else that she won't eat and, of everything under consideration, fish sticks are the most likely thing for her to eat. To get this, we either have to give up the assumption that negation has wide scope in (8) or give up the assumption that *even* in (8) has the same meaning as it does in (1) and (9), i.e., the definition in (3). The former move gives us the scope theory of *even*; the latter, the lexical ambiguity theory.

3.1   *Even* and negation: scope theory

        The scope theory of *even*, first put forth by Karttunen and Peters (1979), allows *even* to take scope wider than negation, giving (8) the LF in (11)a, in which the prejacent

---

[4] I assume here, as is standard following Karttunen (1973), that negation is what he calls a "hole" for presuppositions: a negated proposition inherits the presuppositions of its complement.
[5] I will use the # symbol to indicate when a (predicted) presupposition does not correspond to native speaker intuitions.

proposition includes negation. In this case, using the same entry for *even* as above, the presuppositions come out to be just what we want, i.e., (11)b.

(11)   a.   even [[not] [Amanda will eat [fish sticks]ꜰ]].

      b.   *presuppositions*
          i.   There is something other than fish sticks that Amanda won't eat.

          ii.   Of everything under consideration, fish sticks are the least likely thing for her not to eat.

      c.   *asserts*
          Amanda won't eat fish sticks.

In addition to giving us the right meaning for simple sentences, the scope analysis can account for a certain ambiguity in sentences with *even*. Take a well-known example from Karttunen and Peters (1979).

(12)   It is hard for me to believe that Bill understands even [Syntactic Structures]ꜰ.

This sentence is ambiguous. If *Syntactic Structures* is taken to be a very difficult book to understand, then I am impressed that Bill is so smart that he can understand not only simpler books, but even the difficult *Syntactic Structures*. We can call this the 'hard reading,' adopting the terminology of Barker and Herburger (2000).

The other reading takes *Syntactic Structures* to be a very simple book to understand. The reading is even more salient in Wilkinson (1996)'s variant on the sentence:

(13)   It is hard for me to believe that Bill understands even [Mother Goose]ꜰ.

The most pragmatically plausible reading of (13) is what we can call the 'easy reading' (again, following Barker and Herburger 2000). *Mother Goose* is a very simple book to understand; it is hard for me to believe that Bill understands even this simple book.

This example would be puzzling if *even* always has the meaning in (3) and if also it must be interpreted *in situ*. In that case, only the 'hard meaning' is predicted. The scalar

presupposition requires that for every other contextually relevant book x, the likelihood of Bill understanding *Syntactic Structures* is less than the likelihood of Bill understanding x. That is exactly what we want if the book is taken to be very difficult. However, the other reading, where *Syntactic Structures* (or *Mother Goose*) is an easy book, is not predicted.

Karttunen and Peters (1979) propose an analysis of these facts based on the scope of the *even*-phrase. In order to account for the reading where *Syntactic Structures* is a hard book to understand, the *even*-phrase adjoins to the lower clause, taking scope below the downward entailing (DE) operator in the higher clause.

(14) It is hard for me to believe that S

even S

Bill understands [Syntactic Structures]$_F$

(15) *presuppositions*
     a.   There is something other than Syntactic Structures that Bill understands.

     b.   Of everything under consideration, Syntactic Structures is the least likely thing for Bill to understand.

The existential presupposition for this narrow scope reading is that there is something other than *Syntactic Structures* that Bill understands; the scalar presupposition is that *Syntactic Structures* is the least likely thing for Bill to understand of all the alternatives. This correctly accounts for the facts.

To get the reading where *Syntactic Structures* is an easy book to understand, the *even*-phrase adjoins to the higher clause, above the DE operator. In this case, the prejacent proposition is the larger clause *it is hard for me to believe that Bill understands Syntactic Structures.*

70

(16)

```
            S
          /    \
       even      S
              /      \
```
it is hard for me to believe that Bill understands [Mother Goose]$_F$

(17) *presuppositions*
   a.   There is something other than Mother Goose that it is hard for me to believe that Bill understands.

   b.   Of everything under consideration, Mother Goose is the least likely thing that it is hard for me to believe that Bill understands.

With this structure, we can keep the same likelihood scale in order to get the 'easy reading.' The existential presupposition in this case is that there is something other than *Mother Goose* that it is hard for me to believe that Bill understands; the scalar presupposition is that *Mother Goose* is the least likely thing that it is hard for me to believe that Bill understands. That is, *Mother Goose* should be easy for Bill to understand. This gives us the correct interpretation for (13). Furthermore, it allows us to have a single definition for *even* that accounts for both the 'hard' and 'easy readings.'

3.2   *Even* and negation: lexical ambiguity theory

Rooth (1985) gives a different account of the ambiguous sentences. Under his view there is both the standard *even* of (3) and also a negative polarity item (NPI) *even*. The NPI entry has the effect of giving the wide-scope reading for *even* without requiring it to take scope above the other scope-bearing elements. To illustrate, consider the simple sentence in (8), repeated as (18).

(18)   Amanda won't even eat [fish sticks]$_F$.

The entry for Rooth's NPI *even* (translated into our terminology) is given in (19). This version says that there is some alternative proposition other than p that is not true and that the likelihood of all such propositions is lower than the likelihood of p; in other words, p is the most likely of all the alternatives.

(19) $[[\text{even}_{NPI}]](C) = \lambda p \, \lambda w: \exists q \in C \,[(q \neq p) \, \& \, \mathbf{q(w) = 0}]$ and $\forall q \in C \,[\mathbf{p} \geq_{\text{likelihood}} \mathbf{q}]$. $p(w)$

(20)   a.   not $[[\text{even}_{NPI}]$ [Amanda will eat [fish sticks]$_F$]].

      b.   *presuppositions*
          i.   There is something other than fish sticks that Amanda won't eat

          ii.   For every x under consideration, the likelihood of Amanda eating x is less than the likelihood of Amanda eating fish sticks.

      c.   *asserts*
      Amanda won't eat fish sticks.

If the *even* in (18), with the LF in (20)a, has the NPI definition, then the presuppositions will correctly be that there is something other than fish sticks that Amanda won't eat and that, for every x under consideration, the likelihood of Amanda eating x is less than the likelihood of Amanda eating fish sticks. This analysis accounts for the reading without moving *even* above negation.

      This view can likewise account for the *Syntactic Structures* ambiguity.

(21)   It is hard for me to believe that [[even] [Bill understands [Syntactic Structures]$_F$]].

(22)   It is hard for me to believe that [[even$_{NPI}$] [Bill understands [Syntactic Structures]$_F$]].

The LFs for the two readings will be identical, except the 'hard reading' will have the standard entry for *even* (3) and the 'easy reading' will have the NPI entry (19). Both have only the lower clause as their prejacent proposition. The 'hard reading' arises in the same way as predicted by the scope theory (14). The 'easy reading' has the following presuppositions: there is something other than *Syntactic Structures* that Bill cannot understand and, for every x under consideration, the likelihood of Bill understanding x is less than the likelihood of Bill understanding *Syntactic Structures*. This view assumes that the downward entailing *it is hard for me to believe that* is a hole for presupposition projection, like negation. These presuppositions are phrased differently than the corresponding ones (for the same reading) in (17), but they come out to be equivalent.

3.3 Island constraint objections to the scope theory

There are several arguments in the literature against the scope theory based on the behavior of *even* when found inside of syntactic islands. The general format of the arguments is the same. It is possible to get an NPI-like reading even when *even* is found inside of a syntactic island and when the scope theory would require movement out of that island in order to get the NPI-like reading. Since the island constraint is <u>not</u> violated (i.e., the sentences are grammatical), movement cannot have taken place. These kinds of facts form one of the central objections to the scope theory and, hence, an argument in favor of the ambiguity theory.[6] I will review the facts for the relative clause island and the antecedent of a conditional.

It has been observed that *even* inside of a relative clause can have a reading that can be paraphrased as wide-scope relative to a higher, downward entailing operator (Anderson 1972; Rooth 1985; Rullmann 1997). For example, the sentence in (23) is ambiguous. One reading, corresponding to narrow-scope, ordinary *even*, presupposes that *Syntactic Structure* is an unlikely book to have read (the 'hard reading'). This reading is accounted for by both the scope theory and the lexical ambiguity theory. However, there is also a reading which corresponds to the 'easy reading,' in which *Syntactic Structures* is a likely book to have read.

(23)   They hired no linguist who had even read [*Syntactic Structures*]F.

(Rullmann 1997, 48)

In order to account for this reading on the scope theory, *even* must be allowed to have scope over *no linguist*. In order to do this, though, *even* must be able to move outside of the relative clause. Such a movement would violate the island constraint against movement out of a relative clause. This would be quite surprising. Even items like *each* which are known to prefer wide scope over negation, cannot scope out of a relative clause

---

[6] There is another kind of argument in favor of the NPI-theory that is based on cross-linguistic facts. A number of languages have different lexical items for regular *even* and *even* occurring in downward entailing environments. In order to account for the facts in these languages, we already need to have an NPI definition for *even*. One way to reconcile these facts to the English ambiguity is to suggest that in English NPI *even* and the regular *even* only happen to be pronounced the same way, but that that is not necessarily an indication that NPI *even* is not found in English. I will not review the cross-linguistic data here, but see von Stechow (1991) for German; Rullmann and Hoeksema (1997) and Rullmann (1997) for Dutch; Barker and Herburger (2000) and Herburger (2003) for Spanish; and Giannakidou (2007) for Greek.

to get it: (24) cannot mean that for each of Chomsky's books, they did not hire a linguist who read that book.

(24)   They hired no linguist who had read each of Chomsky's books.

(Rullmann 1997, 49)

On the other hand, the lexical ambiguity theory need not posit an island-violating movement nor account for why *even* can apparently move out of this environment though *each* cannot. On the ambiguity theory, there is no movement out of the relative clause; the 'easy reading' is generated *in situ* with the NPI entry for *even*.

The antecedent of a conditional is another island that allows a reading for *even* which is unexpected on the scope theory. An especially clear example of this form is found in Guerzoni (2003), though she ultimately argues in favor of the scope theory. Take her example (25). This sentence has a presupposition that can only be accounted for by the scope theory if *even* takes scope outside of the antecedent of the conditional. As usual, the presupposition is stated differently by the two approaches. One way to phrase the presupposition is that *you handing in one assignment* is more likely than *you handing in any other number of assignments*. On the lexical ambiguity theory, this likelihood relationship is precisely the one we get with NPI *even*.

(25)   If you hand in even one$_F$ assignment, you will get an A.   (Guerzoni 2003, 93)

A different way to put the likelihood presupposition is as follows: the proposition that *if you hand in one assignment you get an A* is less likely than the proposition that *if you hand in x assignments you get an A, for x > 1*. This presupposition can be achieved by the scope theory only if the prejacent proposition includes the entire conditional. Assuming that these two versions of the presupposition are basically equivalent, both theories can account for the facts. In the case of the scope theory, though, it is at the cost of assuming that *even* can move and escape the island of the antecedent of a conditional. In contrast, other quantifiers and focus particles like *every* and *only* cannot escape this island. Neither (26)a nor (27)a, with *every* or *only* inside of the antecedent of a conditional has a

meaning equivalent to what is found with *every* or *only* (overtly) placed outside of the island. That is, in (26)a–(27)a it is not possible for *every* or *only*, respectively, to scope outside of the island. A similar movement for *even* would thus be puzzling given that such movement is not otherwise attested in this environment.

(26)   a.   If you hand in every assignment, you get an A. $\neq$

         b.   Every assignment is such that if you hand it in you get an A.

(27)   a.   If you hand in only one$_F$ assignment, you fail the class. $\neq$

         b.   Only if you hand in one$_F$ assignment you fail the class.

                                        (Guerzoni 2003, 93)

Therefore, in order to account for the facts where *even* is found inside of an island, the scope theory must assume that *even* is able to violate constraints on movement that seem to hold of related expressions.

The necessity of positing such movement is evidence against the scope theory of *even*. On the other hand, the ambiguity theory, which achieves the relevant readings without movement of *even*, is not subject to the same objection. This island facts can thus be seen as evidence in favor of the lexical ambiguity theory of *even*.

3.4   Wilkinson's (1996) objection to the ambiguity theory

An outstanding problem for the lexical ambiguity theory of *even* is found in Wilkinson (1996). She claims that in the scope of an factive, NPI-licensing predicate like *to be sorry*, the presuppositions of *even* can only be accounted for by the scope theory of *even*. She uses this to argue against the availability of an NPI *even*. Wilkinson's example is (28).

(28)   I am sorry that I even opened$_F$ that book.

First, we can see that narrow-scope, normal *even* is not available here, as can be seen by the presuppositions associated with that reading. The existential presupposition is correct:

there is something other than opening it that I did with that book. The scalar one is not, though: opening it is the least likely thing for me to do with that book. This is not correct, since opening a book is typically one of the most likely things for someone to do with it.

With the NPI entry for *even* the presuppositions are calculated with a prejacent containing only the lower clause, as shown in the structure in (29)a, giving the presuppositions in (29)b.

(29)   a.   I am sorry that [even$_{NPI}$ [I opened$_F$ that book]]

       b.   *presuppositions*
             i.   There is something other than opening it that I did not do with that book. (EXISTENTIAL)

             ii.   Opening it is the most likely thing for me to do with that book. (SCALAR)

The scalar presupposition is correct. However, Wilkinson gives the following scenario to show that the existential presupposition predicted in (29)bi is not correct: "Suppose that we are considering as relevant alternatives to opening that book, reading it, studying it, and committing it to memory. It may be that I did all of those things, so an existential [presupposition] that says there is some other relation that I do not bear to that book is not the right [presupposition]" (Wilkinson 1996, 200). If the context can indeed be restricted so as to consider only those three alternatives, then the NPI theory makes the wrong predictions.

On the other hand, the scope theory gives the correct meaning. Under that view, with *even* scoped above *to be sorry*, the presuppositions will be the following: there is something other than opening it that I am sorry I did with that book (existential); opening it is the least likely thing for me to be sorry that I did with that book (scalar). In the context given, these are the correct presuppositions.

Rullmann (1997) provides a response to this objection to the ambiguity approach to *even*. He proposes that the existential inference we draw from sentences with *even* is not due to an existential presupposition but that it is a pragmatic entailment of the scalar presupposition taken together with the assertion of the sentence. For example, in (30)a

with the contextually salient alternatives in (30)b, the scalar presupposition will state that *Mary invited Bill* is the most likely of the alternatives.

(30) a. Mary didn't even invite Bill_F.

b. {Mary invited John, Mary invited Sue, Mary invited Bill, Mary invited Jane}   (Rullmann 1997, 58)

Rullmann argues that on the basis of this scalar presupposition and the assertion that it is false that Mary invited Bill, the speaker intends the hearer to draw the inference that all of the less likely propositions in the alternative set are also false. Thus, he proposes that the existential inference is a pragmatic entailment.

In the case of the Wilkinson example, Rullmann's account explains why there is no existential inference. In the context she provides, with the alternatives {I opened the book, I read the book, I studied the book, I committed the book to memory}, the scalar presupposition of (29)a is (29)bii: opening it is the most likely thing for me to do with that book. Since (29)a does not entail that the prejacent is false, but rather (based on the factivity of *to be sorry*) that it is true, the hearer cannot conclude from it anything about the less likely propositions.

I do not have an alternative account of the Wilkinson facts. For the purposes of much of this chapter, adopting Rullmann's account is perfectly consistent with what I argue since my arguments will rely on the presence of the scalar presupposition of *even* rather than the existential one. Below, though, in section 4.3 I will give some evidence that a difference between *or even* and *let alone* that suggests that the existential inference is actually a presupposition. If this is, in fact, correct, then a new account of the Wilkinson facts that retains the presuppositional nature of the existential inference is needed.

4 *Even* in coordinate structures

Consider now a sentence with *even* inside of a coordination, i.e., a Focus Sensitive Coordination (FSC). Suppose that there is a test with six problems, the first

being the easiest and each successive problem being harder than the one preceding it.[7] In this context, (31) is possible but (32) is not. The correct analysis of FSCs should account for this asymmetry.

(31)   Arnold couldn't do problem 2 or even [problem 1]$_F$.

(32)   #Arnold couldn't do problem 1 or even [problem 2]$_F$.

4.1   The scalar presupposition in the scope theory

This section will show that the scope theory cannot account for the asymmetry in (31) and (32). The uniform definition of *even* employed by this theory is (3), repeated as (33).

(33) $[[even]](C) = \lambda p \, \lambda w: \exists q \in C \, [(q \neq p) \, \& \, q(w) = 1]$ and $\forall q \in C \, [q \geq_{likelihood} p]. \, p(w)$

Among the scope orders for the various scope-bearing elements in these sentences, only widest scope for *even* is a viable option for the scope theory. Scope for *even* below negation will generate the 'hard readings,' which is not what we want in this context, since problems 1 and 2 are the easiest. Therefore I will focus on the scope theory's account of the structure with widest scope for *even*.

The sentence with the disjuncts in the grammatical order, (31), would have the LF in (34)a. Let us assume that the movement of *even* here is possible, even though it is movement out of a coordinate structure, and see what the scope theory predicts. To calculate the presuppositions, we look at propositions differing in the value of the focus-marked constituent, which in this case is *problem 1*. I will focus in this section on the scalar presupposition (34)b, since that is where the problem with the scope analysis lies. I will have more to say about the existential presupposition of the sentence below.

---

[7] This test is modified from one used by Guerzoni (2003), chapter 3.

78

(34) a. even [not [Arnold could do problem 2 or [problem 1]_F]]

   b. The least likely disjunction of this form
    Arnold could not do problem 2 or _____
               problem 1
               problem 2
               problem 3
                ...
   is [Arnold could not do problem 2 or problem 1].

In investigating the predicted scalar presupposition, we should investigate each of the alternatives and compare it to the prejacent proposition *he could not do problem 2 or problem 1*. To make intuitions clearer, we can translate it into the equivalent *he could not do problem 2 and he could not do problem 1*. We want to compare (35) to all of the other contextually relevant alternatives that differ only in *problem 1*, the constituent bearing focus. These alternatives are given in (36).

(35) Arnold could not do problem 2 and he could not do problem 1.

(36) a. Arnold could not do problem 2 and he could not do problem 6,
   b. Arnold could not do problem 2 and he could not do problem 5,
   c. Arnold could not do problem 2 and he could not do problem 4,
   d. Arnold could not do problem 2 and he could not do problem 3,
   e. Arnold could not do problem 2 and he could not do problem 2

If (34)b is in fact the right scalar presupposition for the sentence (31), then (35) should be less likely than any of the alternatives in (36). To take one as an example, compare (35) to (36)a. It would be less likely for him not to be able to do problem 2 and not to be able to do problem 1 (an easy problem) than for him not to be able to do problem 2 and not to be able to do problem 6 (a hard problem). Similar comparisons will show that the likelihood of (35) is lower than the likelihood of any of (36)b-d.

  Turning now to (36)e, we see that this alternative is also more likely than (35). The reason is that, if one proposition entails another, there is no way for the weaker proposition to be less likely.[8] Since *Arnold couldn't do problem 2* entails (and is thus weaker than) *Arnold couldn't do problem 1 and he couldn't do problem 2*, it is not

---

[8] Thanks to Irene Heim (p.c.) for suggesting this characterization of the generalization.

possible for *Arnold couldn't do problem 2* to be less likely than the *Arnold couldn't do problem 1 and he couldn't do problem 2*. Thus, (35) is, correctly, the least likely of all of the available alternatives.

The problem arises when we consider the same scenario and the example with the disjuncts in the other order, (32) repeated as (37). This example is unacceptable in this context, which needs to be accounted for. Under the scope order we are considering (widest-scope *even*), (37) has the LF in (38).

(37) #Arnold couldn't do problem 1 or even [problem 2]$_F$.

(38) a. even [not [Arnold could do problem 1 or [problem 2]$_F$]]

   b. The least likely disjunction of this form
   Arnold could not do problem 1 or _____

   > problem 1
   > problem 2
   > problem 3
   > …

   is [Arnold could not do problem 2 or problem 1].

Again I will translate the narrow scope disjunction into the equivalent wide scope conjunction for purposes of clarity. The alternatives will have *problem 1* in the first disjunct and will vary in what appears in the second disjunct, since that disjunct carries the focus.

(39) Arnold could not do problem 1 and he could not do problem 2.

(40) a. Arnold could not do problem 1 and he could not do problem 6,
   b. Arnold could not do problem 1 and he could not do problem 5,
   c. Arnold could not do problem 1 and he could not do problem 4,
   d. Arnold could not do problem 1 and he could not do problem 3,
   e. Arnold could not do problem 1 and he could not do problem 1

The likelihood of each of (40)a-d will be higher than the likelihood of (39), exactly as was the above case for (31).

However, also as in case of the grammatical (31), the alternative with identical disjuncts will be more likely than the prejacent proposition in (32). Since *Arnold couldn't*

do problem 1 entails (and is thus weaker than) *Arnold couldn't do problem 1 and he couldn't do problem 2*, it is not possible for *Arnold couldn't do problem 1* to be less likely than the *Arnold couldn't do problem 1 and he couldn't do problem 2*. Thus, (39) is the least likely of all of the available alternatives. This is what we wanted in order to account for the sentence with the disjuncts in the grammatical order, but not what we want here.

Since the prejacent proposition must have lower likelihood than all of the alternatives (which it does in this case), the sentence is incorrectly predicted to be good. This cannot be the right account, then, since it predicts that (31) and (32) are both grammatical. Thus, we cannot account for the grammaticality of (31) and the asymmetry between (31) and (32) with the standard definition of *even*, (3), even with wide scope.

4.2 The scalar presupposition in the lexical ambiguity theory

In this section, I will show that the lexical ambiguity theory does account for the facts about focus sensitive coordination. The definition for NPI *even* is (19), repeated as (41).

(41) $[[even_{NPI}]](C) = \lambda p\ \lambda w: \exists q \in C\ [(q \neq p)\ \&\ q(w) = 0]$ and $\forall q \in C\ [p \geq_{likelihood} q]$. $p(w)$

I will again go through the various scope options for this lexical entry, excluding the scope order *even* > *not* > *or*, since NPI *even* is not licensed outside the scope of the DE operator *not*.

4.2.1   *not* > *even*NPI > *or*

This scope order will turn out to replicate the problem from section 4.1, since the definition in (41) was designed by Rooth to give the same results as wide-scope *even* without movement of the focus particle. Here, as before, I will focus on the scalar presupposition.

(42)   a.   [not] [[even$_{NPI}$] [Arnold could do problem 2 or problem 1$_F$]]

      b.   The most likely disjunction of this form
               Arnold could do problem 2 or _____

                                       problem 1
                                       problem 2
                                       problem 3
                                        …

          is [Arnold could do problem 2 or problem 1].

(42)b says that the most likely proposition of the alternatives is *he could do problem 1 or problem 2*. In the discussion of the scope theory, we had that the <u>least</u> likely proposition is *he could <u>not</u> do problem 1 or problem 2*. The literature on negation and *even* assumes that [p $\geq_{likelihood}$ q] is equivalent to [$\neg$p $\leq_{likelihood}$ $\neg$q] (i.e., that negation inverts that likelihood scale). If this is the case, then (42)b will be the right presupposition for the same reasons as in the section on the scope theory.

Similarly, the ungrammatical example that has the disjuncts flipped (32) is incorrectly predicted to be allowed. Having an NPI *even* thus does not help us if it has the effect of taking scope above disjunction. This reason is that, with *even* (having the effect of being) scoped out of its disjunct, there is no way to tell the difference between the two orders.

4.2.2   *not > or > even*$_{NPI}$

Finally, we come to the scope order that will give the right results: narrowest scope, NPI *even*. If *even* takes scope only as high as the disjunct containing it, we have the LF in (43)a. I adopt here the hypothesis argued for in the previous chapter, that a FSC always involves propositional coordination (followed in some cases, like this one, by ellipsis of some of the material in the second coordinate). This gives us a second disjunct of *he could do problem 1*. The presuppositions are thus calculated only for this disjunct rather than for the whole disjunction, which is what caused the problems in the previous accounts considered. The scalar presupposition of *even he could do problem 1*, according to the NPI definition of *even* is given in (43)b.

82

(43)   a.   [not] [Arnold could do problem 2 or [[even$_{NPI}$] [he could do problem 1$_F$]]]

        b.   Problem 1 is the most likely problem for Arnold to be able to do.

Let us temporarily assume that a coordination always inherits the presuppositions of its coordinates. That is, assume that, when *even* has scope over only one disjunct in (43), the presuppositions are calculated at the embedded level in the usual way and that the sentence as a whole inherits those presuppositions. (Recall from fn. 4 that negation is hole for presuppositions; any presupposition that projects as high as the complement of negation will also be a presupposition of the entire sentence). The picture is more complicated than this, but I will return to this point below.

With this assumption, the presuppositions calculated for the second disjunct are also the presuppositions of the entire sentence. In this case, the scalar presupposition generated for the disjunct, (43)b, gives us the intuitively correct scalar presupposition for the sentence as a whole.

What about the ungrammatical ordering for the disjuncts? Whereas the scope theory gave us identical presuppositions for (31) and (32), an NPI *even* with lowest scope will correctly give us different results in the two cases. The LF for (32) is given in (44)a.

(44)   a.   [not] [Arnold could do problem 1 or [even$_{NPI}$] [he do problem 2$_F$]]

        b.   #Problem 2 is the most likely problem for Arnold to do.

Using the NPI definition with this LF gives a scalar presupposition that requires the second disjunct to have the highest likelihood of all of the alternatives. Whereas that is what we wanted when the second disjunct contained *problem 1*, it is not what we want when the second disjunct contains *problem 2*. This analysis correctly predicts that (32) should be ungrammatical.

4.3 The existential presupposition

Consider now the existential presupposition of *even* inside a coordination like (31), repeated as (45). Based on the lexical entry for an NPI *even* in (19), repeated as (46), we predict the presupposition in (47)b.

(45)   Arnold couldn't do problem 2 or even [problem 1]$_F$.

(46) $[[even_{NPI}]](C) = \lambda p \ \lambda w: \exists q \in C \ [(q \neq p) \ \& \ \mathbf{q(w)} = \mathbf{0}]$ and $\forall q \in C \ [\mathbf{p} \geq_{\mathbf{likelihood}} \mathbf{q}]$. p(w)

(47)   a.   [not] [Arnold could do problem 2 or [[even$_{NPI}$] [he could do problem 1$_F$]]]

        b.   There is something other than problem 1 that Arnold could not do.

This certainly is an inference we can draw from the sentence, but is it a presupposition? One reason to be skeptical is that it does not pass the *hey, wait a minute* test which von Fintel (2004) proposes a diagnostic for presuppositions.

According to the *hey, wait a minute* test, if something is a presupposition of the sentence, i.e., taken for granted by the speaker, a listener may respond with, *hey, wait a minute, I had no idea that...[the presupposition]*. On the other hand, if something is an assertion of the sentence, a response of *hey, wait a minute* is distinctly odd. Take for example the dialogue in (48).

(48)   Speaker A: The mathematician who proved Goldbach's Conjecture is a woman.

        Speaker B: Hey, wait a minute. I had no idea that someone proved Goldbach's Conjecture.

        Speaker B′:   #Hey, wait a minute. I had no idea that that was a woman.

                                                        (von Fintel 2004)

Speaker A presupposes that someone proved Goldbach's Conjecture and asserts that the person who did so is a woman. The *hey, wait a minute* test shows that *someone proved Goldbach's conjecture* is a presupposition of speaker A's utterance, while *the person who proved it was a woman* is not.

Indeed, we can use the *hey, wait a minute* test to show that the scalar presupposition predicted in (43) is a presupposition.

(49)   Speaker A: Arnold couldn't do problem 2 or even problem 1.

Speaker B: Hey, wait a minute. I had no idea that problem 1 was an easy problem. (SCALAR)

The *hey, wait a minute* test confirms that there is a presupposition of (45) saying problem 1 is a likely thing for Arnold to be able to do. The existential presupposition, however, does not pass the *hey, wait a minute* test.

(50)   Speaker A: Arnold couldn't do problem 2 or even problem 1.

       Speaker B: #Hey, wait a minute. I had no idea there was something other than problem 1 he couldn't do. (EXISTENTIAL)

To see why this should be, compare the presuppositions of (45) to those in (51). That sentence indeed passes the *hey, wait a minute* test for both presuppositions.

(51)   Arnold couldn't do even problem 1.

(52)   Speaker A: Arnold couldn't do even problem 1.

       Speaker B: Hey, wait a minute. I had no idea there was another problem he couldn't do. (EXISTENTIAL)

       Speaker B':   Hey, wait a minute. I had no idea that problem 1 was an easy problem. (SCALAR)

So while the scalar presupposition is the same in both (45) and (51), only (51) appears to have the existential one.

The difference between the two sentences is in what each entails. Notice that (45) actually entails the proposition that is under consideration for being an existential presupposition, just like (53) does.

(53)   Speaker A: Arnold couldn't do problem 2.

       Speaker B: #Hey, wait a minute. I had no idea there was a problem besides problem 1 that he couldn't do.

This is explained because, since *even* scopes only over the second disjunct in this analysis, the first disjunct is not relevant for the calculation of the presuppositions. It is

relevant, though, for calculating the entailments of the sentence. *He couldn't do problem 2* entails that there is a problem besides problem 1 that he couldn't do, which is precisely what is under consideration as a presupposition.

There is an argument in the literature that there is no existential presupposition for *even* which is based on different case where a sentence containing *even* does not have an existential presupposition: a sentence containing both *only* and *even* (von Stechow 1991; Krifka 1991):

(54)   a.   John even only drank water$_F$.   (Krifka 1991)

       b.   Bill even danced only with Sue$_F$.   (von Stechow 1991, 817)

In both sentences, *even* and *only* are intended to associate with the same focus. Krifka gives the following introduction to the sentence to try to prompt such a reading: at yesterday's party, people stayed with their first drink of choice. Bill only drank wine$_F$, Sue drank only beer$_F$, and *John even only drank water$_F$* (Krifka 1991, 22). Assuming that such a reading is possible, there is a conflict between the assertion of the sentence and the purported existential presupposition of *even*. This is because it is generally thought that *only P* presupposes P and asserts that P is the only true proposition among the contextually salient alternatives (Horn 1969). As an example, take the following sentence from Horn (1969).

(55)   a.   Only Muriel$_F$ voted for Humbert.

       b.   *presupposes*
            Muriel voted for Humbert.

       c.   *asserts*
            No one other than Muriel voted for Humbert.

We can get these results with the following definition for *only*.

(56) $[[only]] = \lambda P: P . \forall q \in C [q \neq P \rightarrow q = 0]$

86

So, *only* in (54)a contributes the assertion John didn't even drink anything other than water.

(57) a. *existential presupposition of* even
There is some proposition in the set of alternatives that is true.
That is, John drank something other than water.

b. *assertion*
There is no proposition in the set of alternatives that is true.
That is, John drank nothing besides water.

There is predicted to be a conflict between the existential presupposition of *even* and the assertion contributed by the meaning of *only*, and yet the sentence is grammatical. As Rullmann (1997) points out, this observation is especially striking when compared to a sentence containing *only* and *too*, which clearly does have an existential component.

(58) #Bill also danced only with Sue$_F$.

With both *too* and *only* associated with *Sue*, the sentence is not felicitous, in contrast to the sentence with *even* and *only*. One way of interpreting these facts has been that there actually is no existential presupposition for *even*. This is an undesirable move since most sentences with *even* do seem to commit the speaker to an existential presupposition. One alternative suggested by von Stechow (1991) is that the presupposition may be canceled in the sense of Gazdar (1979) in an environment like this. Given the analogous behavior of FSCs containing *even* and those containing *also*, I believe that we must retain an existential presupposition for both and therefore adopt something like von Stechow's alternative suggestion that there is a cancellation mechanism available to account for those cases where it is not felt. The rest of this section offers a reason why the existential presupposition of *even* fails the *hey, wait a minute* test that is consistent with it actually being present in the FSC sentences.

The environment under investigation in this chapter is somewhat different from the *only* and *even* case. There, a predicted presupposition of the sentence conflicts with an entailment of the sentence. Here, a predicted presupposition coincides with an entailment

of the sentence. In the former case, the presupposition seems not to be present, either because it is canceled or because it was never there to start with. In the latter case, the presupposition may still be present, just undetectable by the *hey, wait a minute* test. There is an intuition that the existential presupposition is met in sentence (45) by the other disjunct. One could respond to the question, "Is there something other than problem 1 that Arnold could not do?" by saying "yes, there is another problem besides problem 1 that he cannot do, and you've just told me what it is, namely, problem 2." So the assertion of (what we would get if we uttered only) the first disjunct entails a presupposition of the second disjunct.

Karttunen (1973) proposes that a presupposition, ψ, of the right-hand disjunct project to the disjunction as a while except in cases where the negation of the first disjunct entails ψ, as shown in (59).

(59)   For S = [A or B],

   a.   If A presupposes ψ, then S presupposes ψ.

   b.   If B presupposes ψ, then S presupposes ψ, unless $\neg$A entails ψ.

                                                    (Karttunen 1973)

In fact, this is precisely the situation we have with the existential presupposition in sentences like (31), repeated as (60). For ease of illustration, the disjuncts are given again in (61)a, b. Note that neither disjunct contains negation, since negation scopes over disjunction in (60). The existential presupposition predicted by the NPI theory is (47), repeated as (61)c.

(60)   a.   Arnold couldn't do problem 2 or even [problem 1]$_F$.

       b.   [not] [Arnold could do problem 2 or [even$_{NPI}$ [he could do problem 1$_F$]]]

(61)   a.   A = [Arnold could do problem 2]

       b.   B = [even [Arnold could do problem 1]]

       c. ψ_B = there is something other than problem 1 that Arnold could not do

We see that the existential presupposition of the right-hand disjunct in this sentence, call it ψ_B, is entailed by the negation of left-hand disjunct, $\neg A$: *Arnold could not do problem two* entails *there is something other than problem one that Arnold could not do*. Referring back to Karttunen's formula, this is precisely the case in which the presupposition of disjunct is predicted to not project. Therefore, the failure of the existential presupposition to satisfy the *hey, wait a minute* test does not constituent evidence that there is no such presupposition here. Rather, it is simply due to the fact that it does not project in this environment.

On the other hand, there is no such failure of presupposition project for the scalar presupposition of sentences like (60). In this case, the relevant presupposition of the right-hand disjunct is given in (62)c. As we can see, $\neg A$ does not entail this presupposition of B.

(62) a. A = [Arnold could do problem 2]

b. B = [even [Arnold could do problem 1]]

c. ψ_B = problem 1 is the most likely problem for Arnold to be able to do.

Therefore, Karttunen's system predicts projection of the scalar presupposition to the disjunction as a whole, and negation being a hole for presupposition projection, it is further projected to the entire sentence in (60). This accounts to the scalar presupposition passing the *hey, wait a minute* test.

There is a final implication of the sentence to address. From an utterance of (60)a, a listener seems licensed to infer that Arnold could also not do any of the harder problems either. I suggest that in this case that inference actually has a different source than the existential presupposition of the simple sentence: it is an implicature. To see this, notice that it is significantly easier to cancel the inference when *even* is in a coordination than when it is not.

(63) a. Arnold couldn't even do problem 1.

b. ...#but he could do problem 2-6.

(64)   a.   Arnold couldn't do problem 2 or even problem 1.

          b.   …but he could do problems 3-6.

In the case of (63), we cannot felicitously follow the sentence by saying that in fact he could do all of the other problems because it is an existential presupposition that there is at least one of them that he could not do. On the other hand, when *even* is inside of a coordination, (64), it is significantly easier to cancel the inference that there is another problem that he cannot do. Since it is generally possible to cancel conversational implicatures but not presuppositions, this suggests that the inference one can normally draw from (45), that Arnold cannot do any problem harder than problems 1 or 2, comes about through an implicature.

5   Presuppositions of *let alone*

I have argued that *let alone* is disjunction with *even* adjoined, covertly or overtly, to the first disjunct. Since Karttunen's formula for projection of the presuppositions of a disjunct (59) is asymmetrical, the presuppositions of the first and second disjuncts are not expected to project in the same way. In particular, he proposes that the presuppositions of the left-hand disjunct always project, unlike those of the second. We have seen that the existential presupposition of *even* in the right-hand disjunct do not project in sentences of the kind under consideration. It is expected, though, that if *even* were instead in the first disjunct, the presuppositions would project to the entire disjunction, regardless of any entailment relationship with the other disjunct. This is indeed what we find in *let alone* sentences. Take (65). Unlike the related *or even* sentences, this sentence does pass the *hey wait a minute* test for the existential presupposition.

(65)   Arnold couldn't do problem 1, let alone problem 2.

(66)   Speaker A: Arnold couldn't do problem 1, let alone problem 2.

          Speaker B: Hey, wait a minute. I had no idea there was something other than problem 1 he couldn't do. (EXISTENTIAL)

Using Karttunen's system, we can account for this difference between sentences with *let alone* and ones with *or even*. *Let alone* can be decomposed into *even* and *or*, as in (67)a. Based on the Propositional FSC Hypothesis of the previous chapter, (65) is given the structure in (67)b. This gives us the disjuncts in (68)a,b and the existential presupposition for *even* in (68)c.

(67)   a.   Arnold couldn't <even> do [problem 1]$_F$ or even problem 2.

        b.   [not] [[even$_{NPI}$ [Arnold could do problem 1$_F$]] or [he could do problem 2]]

(68)   a.   A = [even [Arnold could do problem 1]

        b.   B = [Arnold could do problem 2]

        c. ψ_A = there is something other than problem 1 that Arnold could not do·

With *even* in the left-hand disjunct, the relevant presupposition is predicted by (59) to be projected in this case, in contrast to the earlier case where the presupposition was in the right-hand disjunct. This correctly accounts for the fact that the *let alone* sentence passes the *hey, wait a minute* test, but the *or even* one does not.

One advantage of the analysis of *let alone* presented here is that it provides an account of the relationship between the disjuncts that is independently supported by the behavior of *even* elsewhere. An earlier account of *let alone*, Fillmore et. al (1988) proposes that the relationship between the coordinates arises from a scale that is set up based on the context and which is an idiomatic property of the phrase. They propose that the relationship between the two coordinates in a *let alone* sentence is one of semantic entailment, but that the entailment must be evaluated against a scale that is specified by the context: "the entailment in this case must be against the background of a presupposed semantic scale" (Fillmore et. al 1988). They provide a number of nuanced examples showing that a single sentence may be grammatical against one contextual background but that with the coordinates reversed the sentence would be grammatical in a different context. The method of generating the scales, though, is proposed to be an idiomatic property of *let alone*.

The account offered here derives the relationship between the two coordinates by the likelihood scale set up by *even*. Supporting evidence is that the scalar relationship between the coordinates in sentences with *or even* is exactly like those with *let alone* with the coordinates reversed. Furthermore, this account provides an explanation for the asymmetry between *or even* and *let alone* in the projection of the existential presupposition for *even*, based on Karttunen (1973)'s analysis of presupposition projection in disjunction.

Chapter 4: Gapping in Disjunctions

1   Introduction

Much has been written about scope properties of coordinations like *and* and *or*. In particular, a number of studies have shown that in certain respects natural language *and* and *or* do not behave as would be expected if they corresponded to the Boolean connectives $\wedge$ and $\vee$. In this chapter, I will present some new data from gapping that shows a difference in scope properties between *and* and *or* that is likewise unexpected under a traditional analysis. As I will show, gapping is an environment in which disjunction is apparently able to take scope higher than conjunction is, with respect to modal operators.

This is of interest for two reasons. First, it is of interest in trying to elucidate the syntactic structure of gapping sentences. One of the strongest arguments in favor of a Small Conjunct Structure for gapping relies on scope facts to show that modals c-command conjunction. Therefore, data showing that disjunction can take wide-scope with respect to a modal could potentially be seen as evidence against the Small Conjunct Structure. Nevertheless, I will argue that it does not constitute such evidence if we adopt an independently motivated non-Boolean analysis for *or*. Such a move is supported not only because it is the same structure that has been argued for in gapping of conjunctions, but also because disjunctions occurring in constructions other than gapping have been shown elsewhere to have the same apparent wide-scope relative to modals. Thus there is independent evidence both from gapping and from disjunction for the Small Conjunct Structure for gapping of disjunctions.

Secondly, the data on the scope of *or* in a gapping sentence is of interest because it provides a way to account for an otherwise puzzling scope asymmetry between ordinary disjunction and Focus Sensitive Coordinations with a disjunctive component, *let alone* and *or even*.

2 An asymmetry in gapping coordinations

2.1 Gapping and conjunction

As we saw in the introductory chapter, in gapping sentences with *and*, the conjunction takes scope below a modal. For example, (1)a only has the reading where *can* takes scope over *and* (narrow scope conjunction) and not the reading that the non-gapped (1)b has where *and* takes scope over *can* (wide scope conjunction).

(1) a. In this bus, you can sit in the back and your child stand in the front.

  b. In this bus, you can sit in the back and your child can stand in the front.

Consider the meaning that each of the scope relationships would give. The wide scope conjunction reading states that each action is allowed, though not necessarily simultaneously. This reading is consistent with the two actions not being allowed to happen at the same time. The gapping sentence in (1)a does not have this reading, which can be shown because the continuation ...*but whatever you do you have to be next to your child* is not allowed. On the other hand, the narrow scope reading for conjunction gives permission for the two events to happen simultaneously. This reading is available for the gapping sentence.

This is accounted for with a VP-conjunction structure for gapping, the so-called Small Conjunct Structure (2), but not with a TP-conjunction structure, the so-called Large Conjunct Structure (3).

(2) <u>Small Conjunct Structure</u>

(3) Large Conjunct Structure

```
                            TP
              TP  _____/    \
             / \               \
            /   \          and   TP
           /_____\             /\
      You can sit in the front / \
                              /___\
                          your child ~~can~~ stand
                               in the back
```
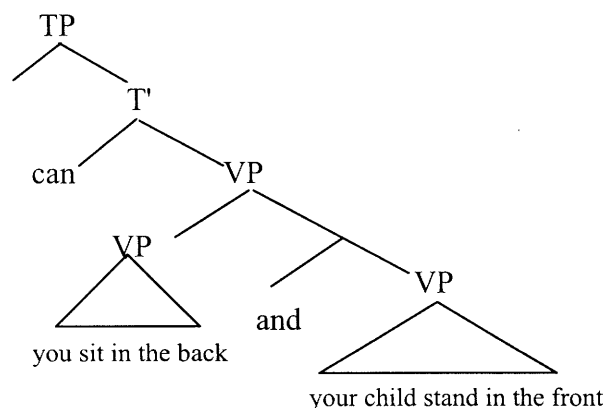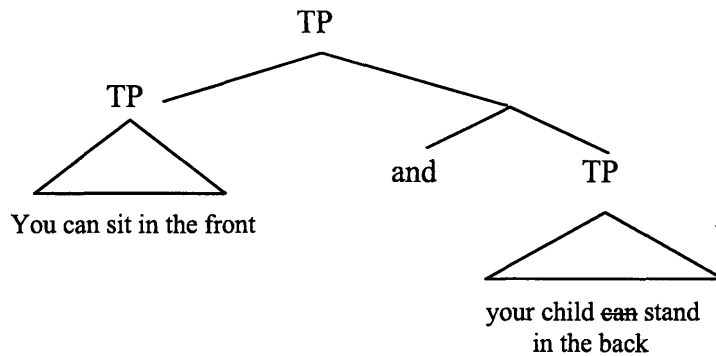
With the structure for gapping in (2), it is clear why the narrow-scope modal reading is unavailable for (1)a: there is no elided modal in the second conjunct ((1)a is not derived from (1)b) and the modal is never within the second conjunct so it cannot reconstruct there. The structure in (3), on the other hand, has conjuncts large enough that there is a modal in each of them (presumably the second would undergo some form of ellipsis since it is not pronounced), so it is unclear how to prohibit a reading in which *and* has scope over *can*.

2.2 Gapping and disjunction

2.2.1 An ambiguity with disjunction

Given the structure in (2), the obvious prediction is that no gapping sentences with a modal should have a wide scope reading for coordination, with respect to a modal. This prediction turns out to be false in the case of disjunction. With disjunction in a gapping sentence there is an ambiguity between wide- and narrow-scope of the *or* with respect to the modal. We can find examples of narrow scope disjunction. These will correspond to situations where, for some particular outcome to occur, either of two events would be sufficient.

(4) *For the Red Sox to make the playoffs...*
     The Sox must beat the Yankees or the Angels lose to the Mariners.

For example, consider (4) in the following scenario. The winner of the Red Sox-Yankees game will make the playoffs and the winner of the Mariners-Angels game will make the

playoffs; based on the various teams' records for the season, the wildcard spot in the playoffs will go to the Mariners unless they have already made the playoffs; otherwise the wildcard slot will go to the Red Sox. In other words, imagine there are two ways the Red Sox could make the playoffs—by beating the Yankees or by getting the wildcard spot, which will happen only if the Mariners win their game. With this scenario, (4) is true. It says that (in order for the Sox to make the playoffs) it is required that we be in one of the following kinds of worlds: a world where the Red Sox beat the Yankees or a world where the Mariners beat the Angels. This is a reading where *or* has scope below *must*. For this reading to be available, we must assume that the speaker is knowledgeable about how baseball works, the current standings of the various teams, etc. For example, we have to assume that the speaker is not the author of this thesis (or that I am faithfully reporting what I have been told by some trustworthy source). Under these conditions, the sentence has a narrow scope reading for disjunction.

Now assume instead a different situation relating to speaker knowledge. Let us say that recently I was talking to my sister's boyfriend and he was telling me how the Red Sox have been playing and what their chances are of getting into the playoffs this year. Being preoccupied with my thesis, I did not pay close attention to exactly what he said. Considering him a knowledgeable source, some time later I report to you that there is only one way for the Red Sox to get into the playoffs at this late date, but I really cannot remember what that one way is. I can utter the same sentence.

(5) *For the Red Sox to make the playoffs...*
The Sox must beat the Yankees or the Angels lose to the Mariners.
...I don't remember which.

That is, under the same conditions as to the actual requirements of the team, *or* can have wider scope than *must* when the speaker's knowledge about the requirements is that one or the other of them represents the actual requirement, but she is not in a position to know which it is. The modal is still deontic, but the epistemic state of the speaker has changed.

We must be careful to make sure that the uninformed speaker has some knowledge of the requirements, but only partial knowledge. This point is better illustrated with a different example of this form.

96

(6)   *To avoid bankruptcy...*
        Mr. Jones must get a raise or Mrs. Jones take on more clients.

Sentence (6) can be truly uttered by an accountant with full knowledge of the laws of bankruptcy and the state of the Jones' finances if she knows that there are only two ways for them to avoid declaring bankruptcy. She can use (6) to state that it is required that either Mr. Jones gets a raise or Mrs. Jones takes on more clients (*must > or*). Alternatively, imagine that the knowledgeable accountant has mentioned earlier in the day to her assistant that the Jones have only these two options, and that later in the day, the assistant hears the accountant say to Mr. Jones on the phone that she has realized that, actually, only one of these two outcomes will save them. The assistant, knowing that there had been thought to be two options (and knowing what those options were) and knowing now that, in fact, only one is the true requirement, can utter (6) to declare that one of two requirements holds of the Jones, but she does not know which it is (*or > must*).

This ambiguity as to speaker knowledge is similar to what we get with plain disjunction of NPs.

(7)   To get to the playoffs, the Red Sox must beat the Yankees or the Orioles.

This sentence can be uttered by the knowledgeable speaker to mean that, for the Red Sox to make the playoffs the following is required: they beat the Yankees or the Orioles (*must > or*).[1] Or it can be uttered by the forgetful speaker to mean that, for the Red Sox to make the playoffs, it is either required that they beat the Yankees or it is required that they beat the Orioles (*or > must*).

---

[1] I am told by my reliable informant that this could happen if, at the end of the regular season, the Red Sox have an eight-game lead over any of the other teams in their division and there are four games left to play. Still to be played are the final game in a series with the Yankees and three games in a series with the Orioles. Since they are leading by 8 games, if the Red Sox win even one of those four games, they will have the record for their division and thus make the playoffs. This is because, even if the Sox lost the other three and some other team won all four of their games, the Red Sox would still be ahead one game. Phew.

2.2.2 *If*-clauses

Data with conditionals provides further evidence that in the gapping cases, there is only one modal. I assume that in a sentence with multiple *if*-clauses, each *if*-clause must have a modal to restrict. First consider sentences without gapping that contain two overt modals and two *if*-clauses.

(8)　　If you want to relax, Bill can give you a massage and Mary can give you your flu shot if you don't want to relax.

(9)　　*Why is the detective asking for handwriting samples?*
　　　　If the butler fails to dot his i's, he must have committed murder or the gardener must have embezzled if he forgets his umlauts.[2]

Using these sentences as a baseline, now consider their gapping counterparts. First, take the conjunction example. (10) is ungrammatical, which is expected given that we have established there is only one modal in the sentence. This means that the second *if*-clause does not have a modal to restrict.[3]

(10)　　??If you want to relax, Bill can give you a massage and Mary your flu shot if you don't want to relax.

Turning now to the gapping disjunction example, we see that it, too, is ungrammatical with two *if*-clauses. This would be puzzling if the sentence had a structure in which each disjunct contained a modal. In that case, we would expect it to be fine to have two *if*-clauses, one for each modal. Instead, this data is support for the view that there is syntactically only one modal in the disjunction examples.

(11)　　??If the butler fails to dot his i's, he must have committed murder or the gardener embezzled if he forgets his umlauts.

---

[2] It has been assumed in the conditionals literature that a sentence of the form ((If A, then B) or (if C, then D)) is not possible, based on a number of examples where these sentences seem either ungrammatical or nearly impossible to parse. I am grateful to Kai von Fintel for helping me construct this example, which seems to be perfectly grammatical.
[3] While it is perfectly possible to have an *if*-clause modifying a covert modal, I assume here that it is not possible to have an *if*-clause modifying a covert modal inside of a small conjunct within the scope of an overt modal.

At this point, we have a puzzle. In a gapping example with disjunction, *or* appears able to take scope over a modal, based on scope judgments. However, the *if*-clause data suggest that there are not actually two modals in the sentence, a conclusion that is also supported by the scope judgments of gapping sentences containing *and*. How, then, could disjunction take scope above the modal if it has the Small Conjunct Structure?

2.2.3 Intervention effect: negation

Before turning to my proposed solution, there is another piece of data that fills out the picture of the disjunction puzzle. When matrix negation is added to one of the ambiguous gapping sentences containing disjunction, the sentence is no longer ambiguous. For example, take (12). Here I use the modal *must*, which has the (lexically specified) property that it always scopes above negation in English.[4] Therefore, in (12) there are three potential scope orders: narrow-scope disjunction (12)a; disjunction scope between the modal and negation (12)b; and wide-scope disjunction (12)c.[5] Only the first is available.

(12) *To avoid bankruptcy...*
      Mr. Jones must not get fired or Mrs. Jones lose her most important client.

    a. $(\Box\neg\,(F \lor L)) \equiv (\Box\,(\neg F \land \neg L)) \equiv (\neg\Diamond F \land \neg\Diamond L)$
    b. $*(\Box\,(\neg F \lor \neg L))$
    c. $*((\Box\neg F) \lor (\Box\neg L))$

This sentence can only mean that it must not be the case that Mr. Jones gets fired or Mrs. Jones loses her most important client or, equivalently, it must be the case that Mr. Jones does not get fired and Mrs. Jones does not lose her client. Neither reading with higher scope for disjunction is available. The sentence cannot have the reading in (12)b, which is paraphrased as: it must be the case that either Mr. Jones doesn't get fired or Mrs. Jones doesn't lose her client. To see this, imagine that an accountant has uttered (12) to the

---

[4] For example, *You must not go* is interpreted as *it must be the case that you do not go* and not *it is not the case that you must go*.

[5] I use the following conventional symbols: $\Box$ for the necessity modal; $\neg$ for negation; $\lor$ for *or*. For this example F = Mr. Jones gets fired; L = Mrs. Jones loses her most important client.

Joneses. A month later, they all meet again and the accountant wants to see if they have followed her instructions so she knows whether to file bankruptcy papers; if it turns out that Mrs. Jones did lose her most important client, but that Mr. Jones did not get fired, the judgment is that the couple did not conform to the requirements. If (12)b were an available interpretation, then (12) would be true in this scenario. Finally, wide-scope disjunction, (12)c, is also unavailable; the sentence cannot mean: it either must be the case that Mr. Jones doesn't get fired or it must be the case that Mrs. Jones doesn't lose her most important client. Recall that the wide-scope disjunction reading is one that is naturally available if the speaker has only partial knowledge of the requirements. For example, if the accountant's assistant knows only that one of two requirements holds but does not know which, she cannot utter (12) to express this uncertainty. Thus, with negation, the gapping sentence is disambiguated in favor of the narrow-scope disjunction reading.

In fact, this observation has been made for gapping with disjunction independent of sentences containing modals.

(13)   John hasn't seen Harry or Bill Sue.   (van Oisouw 1987, 208)

As van Oisouw observes, this sentence has only a narrow scope reading for disjunction. It is equivalent to (14), but not to (15).

(14)   It's not the case that John has seen Harry or Bill has seen Sue.
         = John hasn't seen Harry and Bill hasn't seen Sue.

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

This example, as well as the ones above, show that negation cannot be distributed over the disjuncts in a gapping sentence. Similar data is used by Lin (2002) as evidence in favor of the Siegel-Johnson VP-conjunction account of gapping.

(16)   Sally didn't skate on Saturday or Samantha on Sunday.   neg > *or* (Lin 2002)

This sentence is interpreted with negation outscoping *or* (17)a, which is equivalent to (17)b.

(17) a. It's not the case that Sally skated on Saturday or Samantha skated on Sunday.

b. = Sally didn't skate on Saturday AND Samantha didn't skate on Sunday.

In other words, there is a single negation that is interpreted outside the site of disjunction. That this is the reading we get can be tested by an entailment diagnostic: disjunction having scope over negation entails neither of the disjuncts; negation having scope over disjunction entails both of the disjuncts (Vainikka 1987). Since (16) entails both that Sally didn't skate on Saturday and also that Samantha didn't skate on Sunday, the diagnostic indicates that negation does indeed have widest scope. This follows directly from the structure in (2), since sentential negation is higher than VP, hence higher than the coordination.

However, if the site of conjunction were large enough to include T (and negation), we would expect (16) to have the same interpretation as (18).

(18) Sally didn't skate on Saturday or Samantha didn't skate on Sunday.   *or* > neg

In (18) negation has only the narrow scope reading with respect to disjunction. This sentence only entails that one of the disjuncts be true: it would still be true if Samantha in fact skated on Sunday, as long as Sally did not skate on Saturday. This is not the reading we get for (16). This fact tells us that the two sentences have different structures. In particular, the conjuncts in (16) are both c-commanded by the sentential negation.

In a recent paper, Ackema & Szendröi (2002) give an example which seems to contradict this generalization about wide-scope negation relative to disjunction in gapping. In (19), the reading we get seems to have both the modal and the negation distributed in each conjunct.

(19) I don't know whether too many girls can't dance the samba or boys the tango.

Let us consider instead a simpler version of their sentence, (20) which still has the apparent distributed negation property.

(20) I don't know whether the girls can't dance the samba or boys the tango.

The context they give makes it clear that the *whether* complement should be interpreted as an alternative question. Let us assume for the moment that the generalization that negation cannot distribute in these environments is correct. Is there a way to understand the facts in (19)–(20) under that assumption? If there were a single wide-scope negation outside the scope of the alternatives, the presence of wide-scope negation would force the *whether* complement to be interpreted as a Yes/No question, equivalent to:

(21) I don't know whether or not the girls can dance the samba or the boys can dance the tango.

If the answer to the embedded Y/N question is "No, it's not true that the girls can dance the samba or the boys can dance the tango," and we know from the context that we should be considering alternatives, then the question remains <u>which</u> of the disjuncts makes the disjunction false. This allows the listener to chose from "'the girls can dance the samba' is false" and "'the boys can dance the tango' is false," giving the appearance of a distributed negation.[6] Thus, this example does not represent a counterexample to the generalization discussed in this section. In a gapping context, a modal (can) distribute over disjunction, but negation does not distribute.

3   Alternative semantics for disjunction

Why are gapping sentences with modals unambiguous with *and*, but ambiguous with *or*? Put another way, why do the sentences with *or* allow a narrow-scope modal reading, given the structure in (2).

The puzzle is that the distributed modal reading is unexpectedly available in gapping sentences with disjunction. This is surprising for two reasons. One reason is that, as far as I know, this fact about disjunction is one of the only strong pieces of evidence that the structure in (2) is not (or not the only) structure for gapping. Any solution for the disjunction facts must also account for all the facts that motivated (2) in the first place. The other reason that the disjunction facts are surprising is that the conjunction examples, in contrast, behave as expected and do not allow a distributed modal reading. This difference between conjunction and disjunction is unexpected under the standard view of conjunction and disjunction as equivalent to the logical connectives $\wedge$ and $\vee$.

3.1   Hamblin Semantics

In this section, I will show that adopting an alternative semantics for disjunction provides a solution to the puzzle of the apparently wide-scope *or* allowed gapping. In particular, I adopt the proposal of Alonso-Ovalle (2006) that disjunction be treated as introducing a set of alternatives that is closed by the existential closure operation, in the spirit of Hamblin (1973)'s analysis of questions and Kratzer and Shimoyama (2002)'s analysis of indeterminate pronouns.

The essential feature of Hamblin semantics is that it is based on sets. In this system, most lexical items have their standard denotations, modified to be sets. For instance, the denotation of *Mary* is the singleton set {Mary}, the denotation of *run* is {λx. x runs} (i.e., the set of individuals who run), and so on. There are some exceptions to this general principle for turning standard denotations into Hamblin denotations, however. Certain lexical items are operators that apply to sets, rather than denoting sets themselves. I will return to this point below.

The second general point about Hamblin Semantics has to do with its composition rules. Functional application applies to sets point-wise. To see this, take the schematic in (22). Here we have two daughter nodes, α and β. In this case, we will assume that α is in the domain of β. To get the denotation of the mother node γ, we take the denotation of α, which is the three-membered set {a_1,a_2,a_3}, and the denotation of β, which is the two-membered set {b_1,b_2}, and apply functional application point-wise. Each member of the

set $\{b_1,b_2\}$ applies to each member of the set $\{a_1,a_2,a_3\}$, giving the six-membered set found in (22).

(22)   Functional Application via point-wise combination

$\gamma = \{a_1(b_1), a_2(b_1), a_3(b_1), a_1(b_2), a_2(b_2), a_3(b_2)\}$
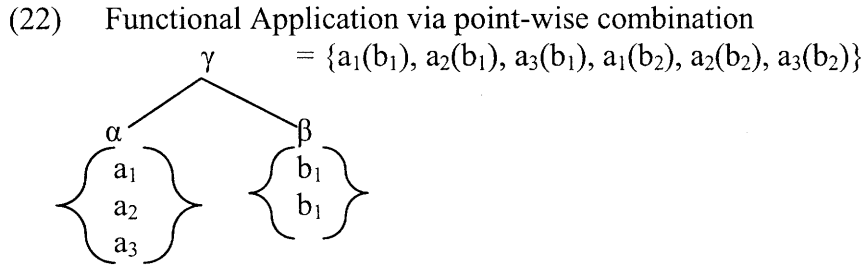
This is a general picture of how most lexical items combine in the Hamblin system.

As mentioned above, there are certain operators that behave differently from other lexical items. These are operators that apply to sets, rather than denoting sets themselves. Under the approach adopted here, *or* is one such operator.[7] It takes the denotation of its disjuncts and creates a set containing those denotations as members.

(23)   <u>The *Or* Rule</u>
Where $[\![B]\!]$, $[\![C]\!] \subseteq D_\tau$, $[\![[_A \text{ B or C}]]\!] \subseteq D_\tau = [\![B]\!] \cup [\![C]\!]$

(Alonso-Ovalle 2006, 22)

Disjunction takes disjuncts of any type and creates from them a multi-membered set. If, for instance, you start with two singleton sets, the result will be a two-membered set that contains as members each of the members of the singleton sets. The basic idea can be demonstrated with the (alternative reading of the) question in (24).

(24)   Did John marry Sally or Betty?

a.   Q John married {Sally, Betty}

b.   Q John {λx. x married Sally, λy. y married Betty}

c.   Q {John married Sally, John married Betty}

d.   Which of the following is true: John married Sally, John married Betty.

---

[7] Other work that treats disjunction in a framework of alternative semantics includes Aloni (2002) and Simons (2005). See Alonso-Ovalle (2006) for a comparison of those views to his approach, which is adopted here.

The disjunction introduces an alternative set, in this case {Sally, Betty}. The verb is applied via point-wise functional application over the members of the alternative set, giving (24)b. Each of the functions in this new set then applies to the subject, giving (24)c. Let us assume that there is a question operator, Q, scoped over the rest of the sentence and that when applied to a set it contributes *which of these is true?*. In that case, the set in (24)c can be closed by the question operator, giving the meaning in (24)d.

There is one further piece to a Hamblin Semantics analysis of disjunction. At some point in the sentence, the multi-membered set needs to be turned back into a singleton set, on the assumption that the interpretive function applies to singleton sets. This might be done in questions with a question operator, but in statements, there must be some other operator closing an alternative set. Existential closure, as defined in (25), is an operation that takes a set of propositional alternatives and returns a singleton set containing the propositional alternative that is true in w iff one of the alternatives is true in w.

(25) Where $[\![A]\!] \subseteq D_{<s,t>}$, $[\![\ \exists P\ ]\!] = \{\lambda w.\ \exists p\ [p \in [\![A]\!]\ \&\ p(w)]\}$

       ⌒

     ∃   A

                                            (Alonso-Ovalle 2006)

Hence, the scope of *or* is not its syntactic position, but the point of existential closure.[8]

Now we are ready to see how this system will account for the gapping facts in (4), repeated as (26).

(26) The Sox must beat the Yankees or the Angels lose to the Mariners.
    a. □ (S or M)   narrow-scope disjunction
    b. (□ S or □ M)   wide-scope disjunction

---

[8] I assume that *and*, on the other hand, has a traditional, Boolean meaning (modified to apply to sets). It takes two sets and returns a singleton set containing the join of the members of the two daughters. As Kai von Fintel points out, the conjunction sets should not actually be singleton sets because in that case the intersection of them would give the null set (in every case except the intersection of {A} and {A}). Two options: 1. we think of them as also containing worlds. Then the intersection would be the set containing the worlds present in both conjuncts, which gives the right meaning (von Fintel, p.c.); 2. it must take a number of sets and return the set containing the generalized intersection of the *members* of the sets (Alonso-Ovalle, p.c.).

First, I will go through the derivation for the (surprising) wide-scope disjunction reading. Following standard practice, I will assume that the modal takes a propositional argument (Kratzer 1991), getting us from (26) to step (27)a. The next step, (27)b combines several steps of the Hamblin composition for each of the disjuncts. The result gives the denotation of the proposition in each disjunct: the first disjunct denotes the singleton set containing the proposition {the Sox beat the Yankees}, abbreviated as {S}; the second disjunction denotes the singleton set containing the proposition {the Angels lose to the Mariners}, abbreviated {M}.

(27)   a.   Must ((the Sox beat the Yankees) or (the Angles lose to the Mariners))
       b.   Must ({S} or {M})

The next step in the derivation is where the operator *or* takes the two singleton sets and returns a two membered set containing the two propositions, (27)c. Next, the modal combines by point-wise functional application with the set {S, M}, (27)d. This is the crucial step for accounting for how a single modal (syntactically) is interpreted in both disjuncts. It distributes over each member of the disjunction set, returning a set that contains two members: the first member says that for every world that is deontically accessible, the Sox beat the Yankees in that world; the second member says that, for every world that is deontically accessible, the Angels lose to the Mariners in that world.

(27)   c.   Must ({S, M})
       d. $\left\{ \begin{array}{l} \lambda w.\ \forall w'\ [w' \in D_w \rightarrow S\ (w')], \\ \lambda w.\ \forall w'\ [w' \in D_w \rightarrow M\ (w')] \end{array} \right\}$

Finally, recall that existential closure must apply at some point. If it can apply freely, then the choice of positions will determine which reading we get. If it applies above the modal, (27)e, we get the wide-scope disjunction reading under consideration.

(27)   e. $\exists \left\{ \begin{array}{l} \lambda w.\ \forall w'\ [w' \in D_w \rightarrow S\ (w')], \\ \lambda w.\ \forall w'\ [w' \in D_w \rightarrow M\ (w')] \end{array} \right\}$

In this case, existential closure takes the set $\{\lambda w.\forall w' \, [w' \in D_w \to S\,(w')], \lambda w.\forall w' \, [w' \in D_w \to M\,(w')]\}$ and returns the singleton set in (27)f. This will be true for a given world if and only if one of the propositions in the alternative set {the Sox must beat the Yankees, the Angels must lose to the Mariners} is true in that world.

(27)   f. $\{\lambda w''. \exists p \, [p \in \begin{cases} \lambda w. \, \forall w' \, [w' \in D_w \to S\,(w')], \\ \lambda w. \, \forall w' \, [w' \in D_w \to M\,(w')] \end{cases} \& \, p(w'')]\}$

> = 1 iff one of the two propositions in the set (the Sox must beat the Yankees, the Angels must lose to the Mariners) is true.

Hence, with an alternative semantics for disjunction and application of existential closure above the modal, the wide-scope disjunction (distributed-scope modal) reading can be derived while keeping the assumption that there is a single modal syntactically.

Can this system also account for the narrow-scope disjunction reading, (26)a? It can if existential closure could equally well apply below the modal. This would result in the narrow-scope disjunction reading. The derivation can be found in (28).

(28)   a.   Must $\exists$ ((the Sox beat the Yankees) or (the Angels lose to the Mariners))
        b.   Must $\exists$ ({S} or {M})
        c.   Must $\exists$ ({S, M})
        d.   Must ($\{\lambda w. \, \exists p \, [p \in \{S, M\} \, \& \, p(w)]\}$)
        e. $\{\lambda w. \, \forall w' \, [w' \in D_w \to \{\lambda w''. \, \exists p \, [p \in \{S, M\} \, \& \, p(w'')]\} \, (w')]\}$
                = 1 iff it is necessary that one of the two propositions {the Sox beat the Yankees, the Angels lose to the Mariners} is true.

Through step (28)c, the derivation is identical to the one in (27). The next step differs. The set that combines with the existential closure operator has not combined with the modal *must*. It contains only the two propositions S and M. When this set is closed, it gives a singleton set that says one of the two propositions, S or M, is true (28)d. When the modal combines point-wise with this set, it combines with the single-member of the set, since the disjunction alternatives have already been closed (28)e. The resulting meaning gives true just in case it is necessary that one of the two propositions, the Sox beat the Yankees or the Angels lose to the Mariners, is true. In this reading, the modal

takes scope above disjunction, giving the reading that is available in a scenario where the speaker is uncertain which of two requirements holds.

In this section I have shown how a Hamblin semantics for *or*, along with the assumption that the existential closure operation can apply above or below the modal, can account for the ambiguity in the gapping sentences with disjunction. This analysis allows us to maintain a well-supported syntactic structure for gapping in which there is a single modal, (2)

3.2   How negation disambiguates

With point-wise Functional Application over sets, we might expect all lexical items to be distributed over disjunction. As we have seen, this does not appear to be the case with negation. The negated version of a sentence like (29)a, is interpreted with negation taking scope over disjunction—negation is not distributed.

(29)   a.   John has seen Harry or Bill Sue.

       b.   John hasn't seen Harry or Bill Sue.

The example in (29)a (repeated from (13)) does not mean that one of the propositions in the set {John hasn't seen Harry, Bill hasn't seen Sue} is true. Instead it means that no proposition in the set {John has seen Harry, Bill has seen Sue} is true: <u>both</u> *John has seen Harry* and *Bill has seen Sue* have to be false for (29) to be true.

This fact can also be accounted for by an alternative-based semantics. According to Kratzer & Shimoyama (2002), sentential negation is a propositional quantifier that takes a set of propositions, A, and returns {the proposition that is true in all worlds in which no proposition in A is true}. That is, in their system, existential closure is built into the definition of (propositional) negation. Hence, negation always closes an alternative set.

From this it follows that if disjunction is in the c-command domain of sentential negation, it will never take scope over negation. We can also account for why the modal *must* does not distribute over the disjunction set in the presence of sentential negation. It is a lexical property of English *must* that it always scopes above *not*. Thus, in (12), repeated as (30), we will get the derivation in (31).

108

(30) *To avoid bankruptcy...*
Mr. Jones must not get fired or Mrs. Jones lose her most important client.

      a. $(\square\neg (F \vee L))$
      b.   *$(\square (\neg F \vee \neg L))$
      c.   *$((\square\neg F) \vee (\square\neg L))$

(31) a.   Must $\neg$ ((Mr. Jones get fired) or (Mrs. Jones lose her most import. client))
       b.   Must $\neg$ ({F} or {L})
       c.   Must $\neg$ ({F, L})
       d.   Must ({λw. $\neg$ $\exists$p [p $\in$ {F, L} & p(w)]})
       e.   {λw $\forall$w' [w' $\in$ D$_w$ $\rightarrow$ {λw". $\neg\exists$p [p $\in$ {F, L & p(w")]} (w')]}
           = 1 iff it is necessary that no proposition in the set {Mr. Jones gets fired,
           Mrs. Jones loses her most important client} is true.

Again, everything proceeds analogously to the derivation in (27) up until step (31)c. Notice that in this formula, there is no $\exists$ operator, since the job of existential closure is done by negation. In step (31)c, negation takes the alternative set and says that no member of that set is true. *Must* applies next, but just as in the case of (28), the set it applies to is a singleton set, and hence it is not interpreted inside the two disjuncts. Instead, it gives meaning that it is necessary that no proposition in the alternative set is true. This is the correct (narrow-scope disjunction) meaning that we get for (30).

4   Scope of disjunctive FSCs with respect to modals

Of the Focus Sensitive Coordinations studied in chapters 2 and 3, there are two with disjunctive components, *let alone* and *or even*. When placed in a modalized context, there is a reading for *or* that is not available for these FSCs. In a sentence like (32), two different continuations are possible.

(32)   For this program, you don't have to write a syntax generals paper or a semantics generals paper.

    a.   *...all you have to do is write a phonology paper.*

    b.   *...but you do have to do one or the other.*[9]

Since, unlike *must*, *have-to* scopes below negation in English, we can give (32) the scope assignment in (33) (where S = (you write a syntax generals paper) and M = (you write a semantics generals paper)). If the requirements of the program are that you are required to write neither a syntax paper nor a semantics paper, we get the continuation in (32)a.

(33)   a. $\neg\,(\Box\,S \vee \Box\,M) \equiv (\Diamond\neg\,S \wedge \Diamond\neg\,M)$

      b. $\equiv (\Diamond\neg\,S)$

      b'. $\equiv (\Diamond\neg\,M)$

If, on the other hand, the requirements are that you have to write one paper that is either a syntax one or a semantics one, but you can chose which, then (32)b is possible. We can get this reading if $\neg$S pragmatically entails M and $\neg$M pragmatically entails S. For this sentence, we can construct a context in which, while it is possible to not write a syntax paper, if you do not, then you write a semantics paper; it is likewise possible not to write a semantics paper, but if you do not, you write a syntax one.

    This free choice reading is not available for the corresponding sentences with *let alone* and *or even*. The only reading in those cases is the one where you neither required to write a syntax paper nor required to write a semantics one (34)a, (35)a.

(34)   For this program, you don't have to write a syntax generals paper let alone a semantics generals paper.

    a.   *...all you have to do is write a phonology paper.*

    b.   **...but you do have to do one or the other.*

---

[9] This is a slightly odd way to state the requirement that you are required to write one of the two kinds of papers but that you can chose which. The reading is helped by putting emphasis on *have to* and *or*.

(35) For this program, you don't have to write a semantics generals paper or even a syntax generals paper.

    a.   *...all you have to do is write a phonology paper.*

    b.   **...but you do have to do one or the other.*

The difference between *let alone* and *or even* on the one hand and *or* on the other is that here there is a pragmatic entailment only in one direction. Because of the likelihood presupposition of *even*$_{NPI}$, the coordinate containing it, call it p, will be the more likely than any of the alternatives including the alternative corresponding to the other coordinate, call it q. Thus, while ¬p pragmatically entails ¬q, ¬q does not pragmatically entail ¬p.

For the sentences in (34) and (35), which both have *even* adjoined to the proposition *you write a syntax paper*, the presuppositions of *even*$_{NPI}$ require that this proposition is more likely than any of the alternative propositions, including the proposition that *you write a semantics paper*. Because of this likelihood relation, ¬(you write a syntax paper) pragmatically entails ¬(you write a semantics paper). However, ¬(you write a semantics paper) does <u>not</u> pragmatically entail ¬(you write a syntax paper), so there is no free choice effect in these sentences. Thus, this asymmetry between disjunction and disjunctive FSCs follows from the likelihood presupposition of *even* and the pragmatic entailment relationship that arises from it.

Chapter 5: Conclusions

This thesis has shown that coordination containing a Focus Sensitive Operator (FSO) *even* or *also* is restricted to coordination of propositions. These coordinations, Focus Sensitive Coordination (FSC), include coordinations involving *or even*, *and even*, *and also*, *not only...but also*, *let alone*, and *as well as*. Apparently smaller coordinates are subject to a range of very specific prohibitions on remnants for gapping. By adopting the Small Conjunct Structure, in which coordination is below T, along with the option of ATB subject movement, all FSCs of *v*Ps or verbal complements or adjuncts were given the same treatment as gapped *v*Ps. The restriction to propositional coordination can be accounted for by adopting a lexical entry for the FSOs where they take propositional arguments. In the case of *even*, it can also take a noun phrase argument, creating a generalized quantifier whose movement is subject to the CSC. This treatment accounts for the behavior these phrases in coordination. It was further argued that *let alone* and *as well as* are composed of a coordination component and a FSO adjoined to the left-hand coordinate. In some cases, this FSO is overt; in the rest it was argued that there is a covert FSO. This analysis accounts for a number of parallels between *let alone* and *or even* and between *as well as* and *and even*.

It was also shown that the semantics and pragmatics of FSC involving *even* and negation can be accounted for under a theory that posits an ambiguity in the meaning of *even*. If *even* within a FSC is given an NPI reading when it is in the scope of negation, an asymmetry between the two coordinates—that the one containing *even* must be the more likely—can be accounted for. It was shown that these facts cannot be accounted for under a theory that derives the NPI-like reading for *even* from QR of *even* above negation. That theory incorrectly predicts that coordinations in which *even* is associated with the less likely disjunct should be as grammatical as those in which it is associated with the more likely one. Thus, the scope theory cannot account for the facts, even if movement of the FSO out of only one coordinate in a coordinate structure were possible, which is problematic in any case. Furthermore, it was argued that an apparent absence of the existential presupposition for *even* in a right-hand disjunct in certain sentences can be accounted for by an entailment relation between the disjuncts and Karttunen's (1973) mechanism for presupposition projection in a disjunction. The prediction from this

analysis is that, in contrast, when *even* is in the left-hand disjunct, as I argue is found with *let alone*, the existential presupposition should project. This prediction was shown to hold.

Finally, it was shown that there is a difference in scope-taking abilities of *and* and *or* in gapping sentences—*or* can take scope higher than *and* can in gapping in relation to a modal, similar to its behavior in other environments. This observation was relevant to the rest of this work because it has been argued that the ability of *or* to take wide-scope is evidence against the Small Conjunct Structure for gapping. Since that structure is well-supported otherwise and since conjunctive and disjunctive FSC have identical scope-taking properties, an analysis of disjunction in gapping was given. It was shown that adopting a Hamblin-style, alternative semantics for disjunction can account for the wide-scope properties of disjunction, while still assigning these sentences the same syntax as conjunction. Moreover, it was shown that when negation is added below the modal and above disjunction, the sentence is disambiguated. Finally, with the disjunctive FSCs *or even* and *let alone* in sentences containing negation, an assumption about the presuppositional likelihood relationship imposed on the two disjuncts by *even* can account for the absence of a free choice reading that is available to the minimal pairs with ordinary disjunction.

References

Ackema, Peter and Krista Szendröi. 2002. Determiner Sharing as an instance of dependent ellipsis. *Journal of Comparative Germanic Linguistics* 5: 3–34.

Aloni, Maria. 2002. Free choice in modal contexts. *Arbeitspapiere des Fachbereichs Sprachwissenschaft*, University of Konstanz.

Alonso-Ovalle, Luis. 2006. *Disjunction in Alternative Semantics*. Ph.D. thesis, University of Massachusetts, Amherst.

Anderson, Stephen. 1972. How to get *even*. *Language* 48(4): 893–906.

Barker, Barbara and Elena Herburger. 2000. Even *even* can be an NPI: Facts from Spanish. *Georgetown Working Papers in Theoretical Linguistics*.

Burton, Strang and Jane Grimshaw. 1992. Coordination and the VP-internal subject hypothesis. *Linguistic Inquiry* 23(2): 305–313.

Coppock, Elizabeth. 2001. Gapping: In defense of deletion. *Papers from the Thirty-seventh Regional Meeting of the Chicago Linguistic Society*.

Dik, Simon. 1968. *Coordination: Its Implications for the Theory of General Linguistics*. Amsterdam: North-Holland Publishing Company.

Fauconnier, Gilles. 1975. Pragmatic scales and logical structure. *Linguistic Inquiry* 4(3): 353–375.

Fiengo, Robert. 1974. *Semantic Conditions on Surface Structure*. Ph.D. thesis, MIT.

Fillmore, Charles, Paul Kay, and Mary Catherine O'Connor. 1988. Regularity and idiomaticity in grammatical constructions: the case of *let alone*. *Language* 64 (3): 501–538.

von Fintel, Kai. 2004. Would you believe it? The king of France is back! (Presuppositions and truth-value intensions). In M. Reimer and A. Bezuidenhout (eds.). *Descriptions and Beyond*. Oxford: Oxford University Press.

Fox, Danny. 1996. ACD and the scope theory of coordination—An argument for Conjunction Reduction. ms. MIT.

Fox, Danny. 2000. *Economy and Semantic Interpretation*. Cambridge: MIT Press.

Fukui, N. and M. Speas. 1986. Specifiers and projection. *MIT Working Papers in Linguistics* 8: 128–172.

Gazdar, Gerald. 1979. *Pragmatics: Implicature, Presupposition, and Logical Form*. New York: Academic Press.

Giannakidou, Anastasia. 2007. The landscape of *even*. *Natural Language and Linguistic Theory* 25, 39–81.

Goodall, G. 1987. *Parallel Structures in Syntax*. Cambridge: Cambridge University Press.

Grosu, Alexander. 1973. On the nonunitary nature of the Coordinate Structure Constraint. *Linguistic Inquiry* 4, 88–92.

Guerzoni, Elena. 2003. *Why* Even *Ask?: On the Pragmatics of Questions and the Semantics of Answers*. Ph.D thesis, MIT.

Hamblin, C.L. 1973. Questions in Montague English. *Foundations of Language* 10: 41–53.

Hankamer, Jorge. 1971. *Constraints on Deletion in Syntax*. Ph.D. thesis, Yale.

Hankamer, Jorge. 1973. Unacceptable ambiguity. *Linguistic Inquiry* 4(1): 17–68.

Hankamer, Jorge and Ivan Sag. 1976. Deep and surface anaphora. *Linguistic Inquiry* 7(3): 391–428.

Heim, Irene and Angelika Kratzer. 1998. *Semantics in Generative Grammar*. Oxford: Blackwell.

Herburger, Elena. 2003. A note on Spanish *ni siquiera, even*, and the analysis of NPIs. *Probus* 15, 237–256.

Hinterholzl, R. 1999. *Restructuring Infinitives and the Theory of Complementation*. Ph.D. thesis, University of Southern California, Los Angeles.

Hoeksema, Jacob and Frans Zwarts. 1991. Some remarks on focus adverbs. *Journal of Semantics* 8, 51-70.

Horn, Larry. 1969. A presuppositional analysis of *only* and *even*. In. R.I. Binnick, A. Davison, G.M. Green and J.L. Morgan, eds. *Papers from the Fifth Regional Meeting of the Chicago Linguistic Society*, 98–107.

Hudson, Richard. 1976. Conjunction reduction, gapping, and right-node raising. *Language* 52: 535–62.

Jackendoff, Richard. 1972. *Semantic Interpretation in Generative Grammar*. Cambridge: MIT Press.

Johnson, Kyle. 1996. In search of the English middle field. ms. University of Massachusetts, Amherst.

Johnson, Kyle. 2006. Gapping isn't (VP) Ellipsis. Paper submitted to *Linguistic Inquiry*.

Karttunen, Lauri. 1973. Presuppositions of compound sentences. *Linguistic Inquiry* 4: 169–193.

Karttunen, Lauri and Stanley Peters. 1979. Conventional implicature. In C. Oh and D. Dinneen (eds.) *Syntax and Semantics II: Presuppositions*. New York: Academic Press, 1–56.

Kay, Paul. 1990. Even. *Linguistics and Philosophy* 13: 59–111.

Kitagawa, Y. 1986. *Subjects in Japanese and English*. Ph.D. thesis, UMass, Amherst.

König, Ekkehard. 1991. *The Meaning of Focus Particles: A Comparative Perspective*. London: Routledge.

Koopman, Hilda and Dominique Sportiche. 1985. Theta-theory and extraction. *GLOW Newsletter* 14.

Koopman, Hilda and Dominique Sportiche. 1991. The position of subjects. *Lingua* 85.2/3. ed. J. McCloskey, 211–259 .

Koopman, Hilda and Anna Szabolcsi. 2000. *Verbal Complexes*. Cambridge: MIT Press.

Kratzer, Angelika. 1991. Modality. In A. von Stechow & D. Wunderlich, eds. *Semantik: Ein internationales Handbuch der zeitgenössischen Forschung*. Berlin: de Gruter, 639–650.

Kratzer, Angelika and Junko Shimoyama. 2002. Indeterminate pronouns: The view from Japanese. Paper presented at the 3rd Tokyo Conference on Psycholinguistics.

Krifka, Manfred. 1991. A compositional semantics for multiple focus constructions. *Proceedings of the First Semantics and Linguistic Theory Conference*.

Kripke, Saul. ms. Remarks on the formulation of the projection problem. Manuscript, Princeton University.

Kuroda, S.-Y. 1988. Whether We Agree or Not: A Comparative Syntax and English and Japanese. *Linguisticae Investigationes* 12, 1–47.

Lakoff, George. 1970. Repartee, or a reply to "Negation, conjunction, and quantifiers." *Foundations of Language* 6, 389–422.

Larson, Richard. 1988. On the double object construction. *Linguistic Inquiry* 16: 33–91.

Larson, Richard and Robert May. 1990. Antecedent containment or vacuous movement: Reply to Baltin. *Linguistic Inquiry* 21, 103-122.

Lechner, Winfried. 2004. *Ellipsis in Comparatives*. Berlin: Moulton de Gruyter.

Lin, Vivian. 2000. Determiner sharing. *Proceedings of the West Coast Conference on Formal Linguistics* 19, 274–287.

Lin, Vivian. 2002. *Coordination and Sharing at the Interfaces*. Ph.D. thesis, MIT.

May, Robert. 1985. *Logical Form: Its Structure and Derivation*. Cambridge: MIT Press.

McCawley, James. 1993. Gapping with shared operators. *Berkeley Linguistics Society* 19, 245–253.

McNally, Louise. 1992. VP coordination and the VP-internal subject hypothesis. *Linguistic Inquiry* 23 (2): 336–341.

Merchant, Jason. 2001. *The Syntax of Silence*. Oxford: Oxford University Press.

Merchant, Jason. 2003. Extensions (sections excised from submitted version of Fragments and Ellipsis). ms. University of Chicago.

Munn, Alan. 1993. *Topics in the Syntax and Semantics of Coordinate Structures*. Ph.D. thesis, University of Maryland.

Neijt, Anneke. 1979. *Gapping: A Contribution to Sentence Grammar*. Dordrecht: Foris.

Oehrle, Richard. 1987. Boolean properties in the analysis of gapping. *Syntax and Semantics* 20: 201–240.

van Oirsouw, Robert R. 1987. *The Syntax of Coordination*. New York: Croom Helm.

Pesetsky, David. 1982. *Paths and Categories*. Ph.D. thesis, MIT.

Postal, Paul. 1974. *On Raising*. Cambridge: MIT Press.

Postal, Paul. 1992. The status of the coordinate structure constraint. ms. IBM.

Postal, Paul. 1998. *Three Investigations of Extraction*. Cambridge: MIT Press.

Rodman, Robert. 1976. Scope phenomena, "movement transformations," and relative clauses. In Barbara Partee (ed.) *Montague Grammar*. New York: Academic Press, 165–176.

Rooth, Mats. 1985. *Association with Focus*. Ph.D. thesis, University of Massachusetts, Amerst.

Rooth, Mats. 1992. A theory of focus interpretation. *Natural Language Semantics* 1(1): 117–21.

Ross, John. 1967. *Constraints on Variables in Syntax*. Ph.D. thesis, MIT.

Ross, John. 1970. Gapping and the order of constituents. In M. Bierwisch and K.E. Heidolph (eds.), *Progress in Linguistics*. The Hague: Mouton, 249–59.

Rullmann, Hotze. 1997. *Even*, polarity, and scope. In Martha Gibson, Grace Wiebe, and Gary Libben (eds.), *Papers in Experimental and Theoretical Linguistics* 4. Edmonton, Canada: Department of Linguistics, University of Alberta, 40–64.

Rullmann, Hotze and Jack Hoeksema. 1997. De distributie van *ook mar* en *zelfs mar* : een corpusstudie. *Nederlandse Taalkunde* 2.

Ruys, E. G. 1992. *The Scope of Indefinites*. Ph.D. thesis, Utrecht University.

Sag, Ivan. 1976. *Deletion and Logical Form*. Ph.D. thesis, MIT.

van der Sandt, Rob and Bart Geurts. 2001. Too. *Proceedings of the 13th Amsterdam Colloquium*. University of Amsterdam.

Siegel, Muffy. 1984. Gapping and interpretation. *Linguistic Inquiry* 15: 523–530.

Siegel, Muffy. 1987. Compositionality, case, and the scope of auxiliaries. *Linguistics and Philosophy* 10: 53–75.

Simons, Mandy. 2005. Dividing things up: The semantics of *or* and the modal/*or* interaction. *Natural Language Semantics* 13: 271–316.

von Stechow, Arnim. 1991. Current issues in the theory of focus. In Arnim von Stechow and Dieter Wunderlich (eds). *Semantik: Ein internationales Handbuch der zeitgenösseschen Forschung*. Berlin: Walter de Gruyter, 804–825.

Stephenson, Tamina. 2005. Quantificational readings of indefinites with FOCUSED creation verbs. ms. MIT.

Stowell, Tim. 1983. Subjects across categories. *The Linguistic Review* 2: 285–312.

Toosarvandani, Maziar. 2008. Scalar reasoning and the semantics of *let alone*. *Papers from the Forty-fourth Regional Meeting of the Chicago Linguistic Society*.

Vainikka, Anne. 1987. Why can *or* mean *and* or *or*? *University of Massachusetts Working Papers in Linguistics* 12, 149–186.

Wilder, Chris. 1999. Right node raising and the LCA. In S. Bird et al. (eds.) *Proceedings of the Eighteenth West Coast Conferences on Formal Linguistics*. Somerville, MA: Cascadilla Press, 586–598.

Wilkinson, Karina. 1996. The scope of *even. Natural language semantics* 4: 193–215.

Zwart, C. J.-W. 1993. *Dutch Syntax: A Minimalist Approach*. Ph.D. thesis, University of Groningen.

Zwart, C. J.-W. 1997. *Morphosyntax of Verb Movement: A Minimalis Approach to the Syntax of Dutch*. Dordrecht: Kluwer.