

Association with Foci

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Abstract

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Association with focus has, since Jackendoff's (1972) dissertation, been the object of intense study. Most researchers, however, have concentrated on explaining the semantic variability of *only* and *even*, whose truth conditions vary with the position of focus. I take as my starting point another property of associating expressions. Both *only* and *even* restrict the distribution of focus, a property that, I argue, they share with a range of other lexical items. But, while *only* and *even* take a single argument and require there to be a focus somewhere inside that argument, expressions like adversative *but* and *let alone* take two arguments, thereby associating with two foci.

Associating expressions, of both the one- and two-place varieties, have two things in common. First, they are crosscategorical in their syntax, taking arguments of a variety of different types. Second, they evoke multiple alternatives—different possible answer to a question. Together, these two independent properties of associating expressions interact with the question under discussion (Roberts 1996, 2004) to give rise to the restriction on the distribution of focus. My approach to association with focus departs from previous ones in important ways. Associating expressions neither make reference to focus in their lexical entry (Rooth 1985, 1992, 1996b) nor to the question under discussion (Beaver and Clark 2008), providing a more satisfying answer to the question of why only some expressions associate with focus.

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List of typographic conventions

Interlinear glossing

1	first person	M	masculine
2	second person	NEG	negation
3	third person	OBJ	object marker
ADJ	adjectivizer	PAST	past tense
F	feminine	PL	plural
IND	indefinite	SG	singular

Logical symbols

\wedge	logical conjunction
\vee	logical disjunction
\rightarrow	material conditional
\neg	negation
\Rightarrow	entailment
$\{x, y\}$	set
$\langle x, y \rangle$	ordered pair
\emptyset	empty set
\in	set membership relation
\subseteq	subset relation
$\llbracket \]$	interpretation function

Variable conventions

w, w', w'', \dots	worlds (type s)
x, y, z, \dots	individuals (type e)
p, q, r, \dots	truth values (type t)
$\mathbf{p}, \mathbf{q}, \mathbf{r}, \dots$	propositions (type $\langle s, t \rangle$)
f, g, h, \dots	one-place functions on entities (type $\langle e, t \rangle$)
$\mathbf{f}, \mathbf{g}, \mathbf{h}, \dots$	properties (type $\langle e, \langle s, t \rangle \rangle$)
R, S, T, \dots	two-place relations (type $\langle e, \langle e, t \rangle \rangle$)
$\mathbf{R}, \mathbf{S}, \mathbf{T}, \dots$	intensional two-place relations (type $\langle e, \langle e, \langle s, t \rangle \rangle \rangle$)
P, Q, R, \dots	generalized quantifiers (type $\langle \langle e, t \rangle, t \rangle$)

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Chapter 1

Introduction

When we are trying to understand the truth conditions of a sentence, we usually only have to consider the words it contains and how they are combined. For the most part, prosody—including stress and intonation—does not seem to matter. Association with focus, a phenomenon introduced to generative linguists by Jackendoff (1972), comes as something of a surprise, then.¹ When a sentence contains an ASSOCIATING EXPRESSION, something like *only* or *even*, its truth conditions can vary with the position of focus. Since, in English, the canonical realization of focus is prosodic, the sentence’s meaning appears to change with just a change in intonation. Why do some lexical items associate with focus, but not others? This is the question I am trying to answer here.

I start, though, with a different property of association with focus, one that is somewhat less conspicuous than the semantic interaction with focus. Jackendoff observes that *only* and *even* also restrict the distribution of focus. If *only* adjoins to the subject, then there must be a focus somewhere inside the subject. If it adjoins to the verb phrase, there must be a focus somewhere inside the verb phrase. There are, I argue, more expressions that constrain the position of focus than first meets the eye. In particular, there is a class of lexical items that require the presence of two foci, one inside each of their syntactic sisters. These two-place associating expressions include adversative *but* (Anscombe and Ducrot 1977, Lang 1984:238–262, Horn 2001:402–413) and *let alone* (Fillmore, Kay, and O’Connor 1988). When adversative *but* coordinates two noun phrase subjects, there must be a focus inside each of these noun phrases. When it coordinates two verb phrases, then there must be a focus inside each verb phrase.

The obligatoriness of associated foci is not immediately obvious. A number of confounding factors have led researchers in the past to the spurious conclusion that they are optional. The first half of Chapter 2 is dedicated to establishing that associating expressions do, in fact, restrict the distribution of focus. While *only* and *even* on the one hand and adversative *but* and *let alone* on the other are unified in this way, they differ in another. The truth conditions of sentences containing a one-place associating expression can vary with just a change in the position of focus. But such semantic variation is not possible with adversative *but* or *let alone*. Without modifying the content of the sentence, changing the focus structure of a sentence containing a two-place associating expression actually results in infelicity. In the remainder of Chapter 2, I outline a typology of associating expressions, laying the groundwork for my account of why they all restrict the distribution of focus and yet differ in such an important way.

¹Jackendoff attributes the observation to a manuscript by Susan Fischer.

I provide this account in Chapter 5. My approach is fundamentally discourse-oriented. I adopt Roberts' (1996, 2004) question-under-discussion framework, where discourse is structured by questions ordered on a question-under-discussion stack. In Roberts' original formulation, these questions are ordered by their relative informativeness. Drawing on Groenendijk's (1999) logic of interrogation, I add additional constraints on the structure of discourse. Association with focus then arises because of how associating expressions interact with the question under discussion. They all share two independently motivated properties:

(i) *Crosscategoriality*

An associating expression can take subparts of the sentence as its argument.

(ii) *Multiple alternatives*

An associating expression evokes more than one alternative.

The first property, crosscategoriality, is syntactic. One-place associating expressions are adverbs that adjoin to various constituents in the sentence. Two-place associating expressions are coordinators that can combine constituents of a wide variety of types. The second property is semantic. Associating expressions all evoke multiple alternative answers to a question.

I introduce the two properties above in Chapter 2, and I show how they give rise to association with focus in Chapter 5. These two chapters bookend Chapters 3 and 4, where I draw out the systematic parallels between the one- and two-place associating expressions in considerable detail. This is necessary since, while the syntax and semantics of *only* and *even* have been extensively treated, their two-place counterparts are less well studied. A large part of the two central chapters is given over to providing syntactic and semantic analyses for adversative *but* and *let alone*.

In Chapter 6, I draw out the consequences of my account of association with focus for the theory of focus more generally. The generative conception of focus originates partly in Halliday's (1967b:226) view that the focus of a sentence 'replac[es] the wh-element in a presupposed wh-question.'² This is essentially a pragmatic concept, one where focus serves to constrain the discourse contexts in which a sentence can be used. The study of focus would, under this view, fall outside the domain of truth-conditional, model-theoretic semantics, as developed by Frege, Tarski, Davidson, Kripke, Montague, and others—an approach to natural language meaning in which to know what a sentence means is to know the conditions under which it is true. Focus does not affect a sentence's truth conditions, only its felicity conditions.

The seeming exception to this, as we have seen, is association with focus. With associating expressions, the position of focus can affect truth conditions. The dominant approach since Jackendoff's dissertation has been to postulate a grammatical mechanism for deriving the correct meaning of *only* or *even*. In semantic theories of focus, such as Rooth's (1985, 1992) alternative semantics, information about focus is represented model theoretically as a dimension of meaning that lies, usually invisibly, alongside the ordinary one we are accustomed to. Associating expressions make reference to this alternate dimension so that focus contributes directly to their meaning. Nowhere in the account of association with focus that I propose do associating expressions make reference to focus as part of their syntax or semantics. The distributional restriction on focus arises from

²There are, of course, other information-structural categories, even within Halliday's framework. These include TOPIC, COMMENT, THEME, RHEME, and no doubt others. See Vallduví 1992:28–52 for an excellent discussion of how these concepts relate to each other.

how two properties of associating expressions— their crosscategoriality and the multiple alternatives they evoke— interact with the question under discussion. All focus does, then, is constrain the discourse contexts in which a given sentence can appear.

A note on data Wherever possible I have used naturally occurring data. Each example is accompanied by the type of source it comes from (either corpus, internet, literature, or periodical), and the sources themselves are provided in the references section. Corpus examples all come from the British National Corpus (version 2).³ They are sourced with a three-character code corresponding to the text of origin followed by the line number within that text. For constructed examples, English judgments are my own, while Persian judgments come from three native speakers of the dialect spoken in Iran, who reside either in Tehran, Iran or the United States. I have added focus marking to examples from written sources according to my intuitions.

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Chapter 2

A distributional restriction on focus

2.1 What is focus?

Focus does not usually affect the truth conditions of a sentence. The answers in (1–3), which each have focus located in a different position, are all true in the exact same set of circumstances—those in which Max makes sushi.

- (1) Q: Who has made sushi?
A: [MAX]_F has made sushi.
- (2) Q: What has Max done to sushi?
A: Max has [MADE]_F sushi.
- (3) Q: What has Max made?
A: Max has made [SUSHI]_F.

If focus does not contribute to these sentences' truth conditions, what does it do? It constrains the discourse contexts in which they can be used. The position of focus in the answer must correspond to the *wh*-phrase of the question.¹ The answer in (1), for instance, which has a focus on the subject, can only serve as a felicitous answer to the subject *wh*-question in (1). Using it in response to the questions in (2) or (3) is infelicitous. The terms *COHERENCE* and *CONGRUENCE* are useful here. An answer is coherent to a question if it counts as an answer semantically. The answer in (1) would be coherent after any of the questions in (1–3). But, it is only congruent to the subject question in (1). Focus thus matters only for determining question-answer congruence—not for whether the answer is a coherent one.²

In (1–3), focus gets a formal realization that sets it apart from the rest of the sentence. This is a prosodic prominence that combines intonation (a high pitch accent) and stress, and is notated

¹This is not an uncontroversial view of focus. It is a common intuition that focus introduces an existential presupposition. The felicitous answer in (1) leads one to think that *SOMEONE* has made sushi. Geurts and van der Sandt (2004) take this intuition seriously, treating focus as an existential presupposition that behaves like other presuppositions—it projects, it is accommodated, etc. Within the conception of focus articulated here, however, the existential presupposition arises indirectly, from the constituent question presupposed by focus (Kadmon 2001:259, Beaver and Clark 2008:45–49, Abusch 2010).

²Congruence must also be defined between questions—as Roberts (1996:107–114) does—since they have focus structures of their own.

by capitalizing the syllable hosting it. But focus is not always marked prosodically in the same way. When focus occurs in SECOND OCCURRENCE contexts, first identified by Partee (1991:21), it is not distinguished through any intonational means, though it is still stressed (see Rooth 1996b among others). Nor does the location of a prosodic prominence always tell us unambiguously how large a focus is. The possibility of what Selkirk (1995:554) calls FOCUS PROJECTION means that the sentence in (4), which has a single prominence on *bats*, can answer a number of different questions, including: *What did Mary buy a book about?*, *What did Mary buy?*, *What did Mary do?*, and even *What happened?*

- (4) Mary bought a book about BATS.

For each of these questions, the size of the focus would be different, ranging from a very narrow focus on just the object *bats* to a very broad focus on the entire sentence. Since prosody is not an entirely reliable correlate of focus, I use square brackets, []_F, to indicate the size and position of foci.³

The distribution of focus is usually free. The answers in (1–3) have the same lexical content, and within this string, focus can occur either on the subject DP (1), the verb (2), or the object DP (3). When an associating expression is present, however, this is no longer true. The position is restricted, as Jackendoff (1972:247–254) observes. When *only* is adjoined to the verb phrase, the sole focus of the sentence can be located on either the verb or the object— not on the subject. Since, as we will see below, *only* does not adjoin solely to verb phrases, I propose a more general statement of this DISTRIBUTIONAL RESTRICTION ON FOCUS:⁴

- (5) An expression α imposes a distributional restriction on focus if there must be a focus in each of α 's sisters.⁵

Much of the rest of this chapter is dedicated to showing that the distributional restriction on focus characterizes — not just the traditional associating expressions *only* and *even* — but also expressions like adversative *but* and *let alone* that have never before been investigated under the rubric of association with focus.

The distributional restriction, as defined in (5), makes reference to an associating expression's syntactic relationship to the rest of the sentence. To understand how the one-place associating expressions *only* and *even* restrict the distribution of focus, we thus first need an analysis of their

³The question of how prosody and focus are related is relevant to us here inasmuch as we use prosody to discern what is focused. Most theorists assume the existence of some sort of focus feature. Either this feature is assigned to the highest focused constituent and it percolates down to the element on which it is realized (Gussenhoven 1983, 1992, 1999, Jacobs 1991), or it starts out on the pitch-accented expression and percolates up to mark the entire focused constituent (Selkirk 1984, 1995, Rochemont 1986). Schwarzschild (1999) provides an optimization based account that reduces, if not eliminates, the need for focus features and mechanisms for their percolation.

⁴This is similar to the characterization by Aoun and Li (1993:206), which they attribute to an unpublished manuscript by Christopher Tancredi: 'An operator like *only* must be associated with a lexical constituent in its c-command domain.' My statement in (5) relies solely on sisterhood — not c-command — so that we can talk about expressions that associate with pairs of foci.

⁵This definition makes reference to syntactic constituency, but it is not syntactic structure itself that matters. Rather, it is the functor-argument structure of the sentence over which the distributional restriction on focus is defined. These two structures are generally isomorphic, though, since a functor and its argument are typically syntactic sisters. Without a concrete semantics for the associating expressions, it is easier to talk about the distribution of focus in terms of syntactic structure.

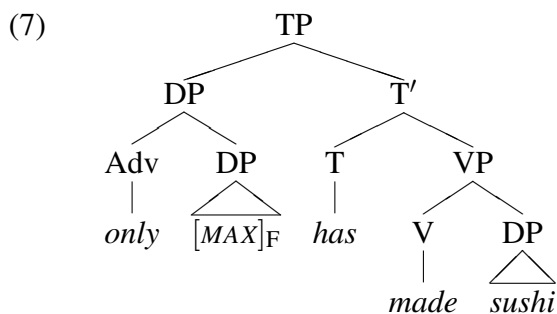
syntax, which I provide in §2.2. As an empirical generalization, the distributional restriction on focus might seem a bit obvious. But, as I discuss in §2.3, it was long thought, because of second occurrence focus, that associated foci were optional. There are a number of diagnostics that we can use to show that second occurrence foci, while not realized like other foci, are actually present. I extend these same diagnostics in §2.4 to two-place associating expressions, showing that they also restrict the distribution of focus. With a grasp of what it means to be an associating expression, I next begin to lay the groundwork for subsequent chapters. In §2.5, I propose a typology of associating expressions that draws out the semantic parallels amongst them. This typology serves to structure the rest of the dissertation, and it starts us off towards understanding why associating expressions have the properties they do. How that journey will unfold I describe in §2.6.

2.2 The syntax of *only* and *even*

The one-place associating expressions, in general, have a crosscategorical syntax. They adjoin to most major sentence constituents. *Only*, for example, adjoins to DPs (6a), VPs (6b), and PPs (6c).

- (6)
- a. **Only** [MAX]_F has made sushi.
 - b. Carrie has **only** visited [the Golden Gate BRIDGE]_F.
 - c. My mother will walk **only** [to WORK]_F.

The focus in all these sentences is located to the right of *only*, which means that, since English is right-branching, it is located inside *only*'s sister. The sentence in (6a), for instance, receives the following parse:

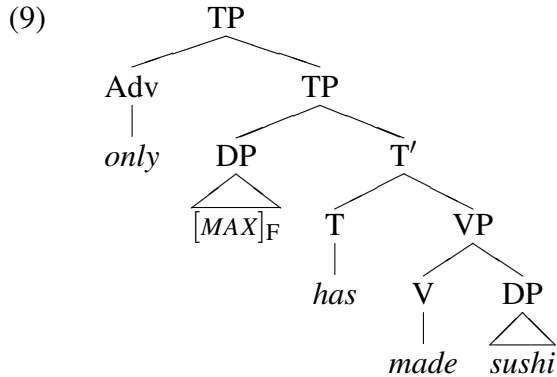


Only adjoins to the subject *Max*, and focus extends over the entire DP. If we moved this focus elsewhere in the clause—onto the object, for instance, as in (8a)—the result is infelicity:

- (8)
- a. # **Only** Max has made [SUSHI]_F.
 - b. Max has made [SUSHI]_F.
 - c. **Only** [MAX]_F has made [SUSHI]_F.

When the associating expression is not present, focus is, of course, not restricted in the same way, and so (8b) is felicitous. The way to fix (8a) is to add a focus to the subject DP, as in (8c), thereby satisfying the distributional restriction on focus.

I say *only* adjoins to MOST major sentence constituents since there is one it does not adjoin to—root clauses. Though, we might think that (6a) should be parsed so that *only* adjoins to the entire TP:



This is exactly the structure that Buring and Hartmann (2001) propose for parallel German sentences with *nur* ‘only’. According to them, though *nur* in (10) occurs to the immediate left of the subject *die Harten* ‘the tough ones’, it adjoins to the root clause.

- (10) Nur [die HARTEN]_F kommen in den Garten.
 only the hard come into the garden
 ‘Only the tough ones make it into the garden.’ (Buring and Hartmann 2001:244)

This is the right analysis for German, Buring and Hartmann argue, since *nur* does not, elsewhere in the language, adjoin to DPs.⁶ It does not, for instance, occur adjoined to the DP complement of a preposition (though see Bouma et al. 2007 for corpus evidence to the contrary). But, in English, *only* has no problem adjoining to these constituents:

- (11) In January, the Carnegie Foundation for the Advancement of Teaching gave UMass Dartmouth a community engagement classification it gave **to only 118 other colleges**. (periodical)

There is thus no distributional evidence in English to suggest that *only* cannot adjoin to the subject DP, as in (7). This parse, moreover, allows us to make sense of the distributional restriction on focus, something the alternative parse in (9) does not. If *only* could adjoin to root clauses, it would be completely mysterious why, when *only* occurs sentence initially, focus is confined to the subject DP.⁷

While *only* does not adjoin to root clauses, there is no problem with embedded clauses. In (12), *only* appears to adjoin to an embedded finite CP, with the associated focus extending over that entire clause.

- (12) ‘A note came with Rushton’s second bird. You will remember he carried two?’ Brydda nodded impatiently. ‘There was no identification on the note. It said **only [that Rushton was being held and would die if Misfits didn’t aid the rebels]**’ (literature)

⁶Buring and Hartmann do not rely just on distributional evidence. They contend that sentence-initial *nur* does not form a constituent with a following topicalized DP since they cannot be reconstructed together. Their interpretation of the relevant facts has, however, been contested by Reis (2005) and Meyer and Sauerland (2009).

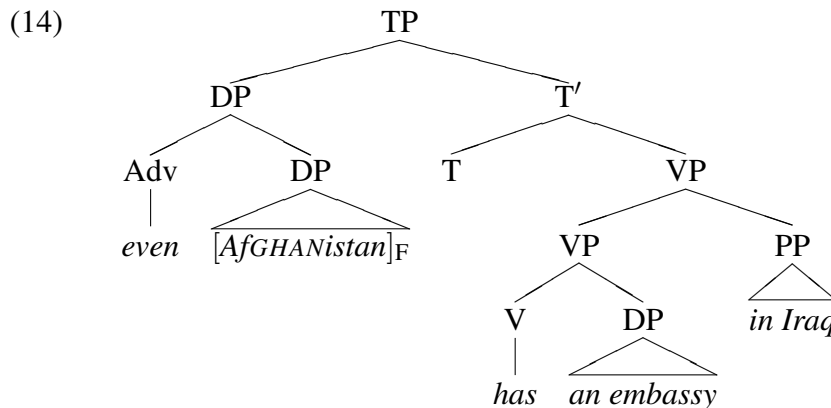
⁷This leads one to wonder whether, when *nur* occurs in sentence-initial position, the distribution of focus is free. Buring and Hartmann do not say.

Büring and Hartmann suggest that such examples involve right-adjunction of *only* to the verb phrase and extraposition of the embedded CP.⁸ With such a parse, though, *only* and the embedded would not form a constituent to the exclusion of the verb. That is not what standard constituency tests show. Both elements can occur together as the postcopular element in a pseudocleft, and they can be topicalized together:

- (12') What it said was **only** [that Rushton was being held]_F.
 (12'') **Only** [that Rushton was being held]_F, it said.

Turning now to *even*, it, too, is crosscategorical in its syntax. It adjoins to DPs (13a), VPs (13b), and PPs (13c). The sentence in (13a) has the parse in (14).

- (13) a. Even [AfGHANistan]_F has an embassy in Iraq.
 b. Marcy even made [FISHsticks]_F for the party.
 c. He tried to steal money even [from his PARENTS]_F.



Since *even* imposes the same restriction as *only*, focus is not possible in (13a) except on the subject. Moving it onto the object, as in (15a), is infelicitous.

- (15) a. # Even Afghanistan has [an EMBassy]_F in Iraq.
 b. Afghanistan has [an EMBassy]_F in Iraq.
 c. Even [AfGHANistan]_F has [an EMBassy]_F in Iraq.

⁸Büring and Hartmann also suggest (p. 266 fn. 28) that English does not permit *only* to adjoin to clauses embedded inside of a noun phrase. They provide the (partial) example in (i), though I have found naturally occurring examples of exactly this type, e.g. (ii).

- (i) * The fact only that [JOHN]_F came... (Büring and Hartmann 2001:266)
 (ii) In contrast to the Shi'ites, who gloried in the memory of their martyrs, Sunni theologians and heresiographers had a marked tendency to gloss over sectarian controversies in the early history of Islam, and even to glorify the actors on both sides: 'An attempt is made to forget that they had fought one another so bitterly, and to hold to **the fact only** [that they were brother Muslims]_F.' (literature)

It is not clear to me what else *only* could be adjoining to here but the embedded CP. The parse that Büring and Hartmann propose for CPs embedded under verbs—adjunction of *only* to VP plus extraposition—is not available.

The mere presence of the focus on the object is not problematic, as indicated by (15b). Rather, it is the lack of a focus on the subject DP that causes infelicity, and adding an additional focus to the subject, as in (15c), satisfies the constraint in (5).

There is one caveat. While *even*, when it adjoins to DPs or PPs, behaves as described, it is more erratic when it appears at the left edge of the verb phrase. Jackendoff observes (p. 250) that, in this position, *even* can associate with a focus on the subject, as in (16a). It even allows, as Fraser (1971:51) observes, for broad focus on the entire sentence, as in (16b).

- (16) a. [AfGHANistan]_F has even built an embassy in Iraq.
 b. This has been a strange year: there was a total eclipse of the sun, rivers rose up out of their banks, men bit dogs, and [Harvard has even been holding PEP rallies]_F.
 (Anderson 1972:899)

While this fact about VP-adjoined *even* remains unexplained, it does not seriously challenge the distributional restriction on focus. When *even* adjoins to other major sentence constituents, it does constrain the position of focus in the expected way. As we move forward, we just need to be careful to set VP-adjoined *even* aside.

2.3 Second occurrence focus

The distributional restriction on focus might not seem very surprising. Only recently, however, has it been widely acknowledged that some foci are indeed obligatory. The reason for this, largely, is that in some environments, first identified by Partee (1991:21), a constituent that we would expect to be in focus does not bear a pitch accent. Consider, for instance, the exchange in (17).

- (17) A: Eva only gave xerox copies to [the GRADuate students]_F.
 B: (No,) Petr only gave xerox copies to [the graduate students]_F.
 (Partee 1991:21)

In A's statement, there is a focus associated with *only* on *the graduate students*, realized with a pitch accent. B corrects A, saying that Petr was the one who gave xerox copies to the graduate students, and no one else. Given this interpretation, we would expect *the graduate students* in B's utterance to be focused. But it does not bear a pitch accent. The nuclear pitch accent (the final pitch accent of an intonational phrase) is located on the subject, so that everything following the subject is deaccented, including the SECOND OCCURRENCE FOCUS on *the graduate students*.⁹

As Beaver et al. (2007) argue, though, just because a second occurrence focus does not bear a pitch accent does not mean that it is prosodically identical to the surrounding unfocused material. Replicating earlier work by Rooth (1996b), Bartels (2004), and Ishihara and Féry (2006), they show that *the graduate students* in B's response receives a more prominent realization than adjacent words. It has both increased energy (it is louder) and increased duration. While the phonetic realization of a second occurrence focus is not as salient as a pitch accent, it does not lack a focus altogether.¹⁰ It is admittedly hard to discern, without doing any phonetic measurements, the

⁹It is called this, not because there is a preceding focus on the subject *Petr*, but because *the graduate students* has occurred once before, in A's original utterance.

¹⁰Though see Howell 2008 for further experimental data and an alternative interpretation of Beaver et al.'s results.

	STRONG	WEAK
3SG.F	<i>her</i> /hər/	' <i>er</i> /ər/
3SG.M	<i>him</i> /hɪm/	' <i>im</i> /ɪm/
3PL	<i>them</i> /ðɛm/	' <i>em</i> /əɪm/

Table 2.1: English strong and weak objective pronouns

presence of a second occurrence focus. Luckily, Beaver and Clark (2008:142–176) provide two additional tests for the obligatoriness of foci associated with *only* and *even*: weak pronouns and extraction.¹¹

English has, in its third person objective pronoun paradigm, a distinction between strong and weak pronouns, as shown in Table 2.1. While the strong pronouns are morphologically independent, the weak pronouns lean on material to their left and cannot bear a pitch accent (Selkirk 1972:130–145, Selkirk 1984:392–400):

- (18) a. Peter only takes HER to the movies.
b. *Peter only takes'ER to the movies.

In fact, as Krifka (2004:204f.) observes, the weak pronouns cannot be in focus at all, whether or not they bear a pitch accent.¹² We see this in second occurrence contexts:

- (19) A: Mary's boyfriend only likes [HER]_F.
B1: Even her BOSS only likes [her]_F.
B2: #Even her BOSS only likes'er. (Rooth 1996b:213f.)

B follows up on A's assertion by adding that Mary's boss, too, likes only her. The strong pronoun in B's first answer, which bears the second occurrence focus, cannot be realized as a weak pronoun, as in B's second answer. Then, there is no focus present in the VP at all, and the sentence is infelicitous. The focus associated with *even* similarly cannot be realized as weak pronoun:

- (20) A: Mary said that she would even kiss [HER]_F.
B1: No, only JOHN said that he would even kiss [her]_F.
B2: #No, only JOHN said that he would even kiss'er.

The second occurrence focus on the direct object of *kiss* in B's response allows for it to be realized only as the strong pronoun *her* (B1), not as a weak pronoun (B2).

Persian is, in this connection, a useful language to look at, since it has a more robust system of strong and weak pronouns, given in Table 2.2. They occur across all persons and numbers, and differ quite significantly in phonological form. As in English, second occurrence foci cannot be realized as weak pronouns. This is shown for *faqat* 'only' in (21).

¹¹Beaver and Clark propose (pp. 176–181) that verb phrase ellipsis can be used for the same purpose. But, since I was not able to confirm their judgments, I have not included discussion of it here.

¹²Similar observations are made by Hoeksema and Zwarts (1991:67 fn. 3), by von Stechow (1994:64), who attributes it to a personal communication with Susanne Tunstall, and by Rooth (1996b:213f.).

	STRONG	WEAK
1SG	<i>man</i>	=(<i>e</i>) <i>m</i>
2SG	<i>to</i>	=(<i>e</i>) <i>t</i>
3SG	<i>un</i>	=(<i>e</i>) <i>sh</i>
1PL	<i>mā</i>	=(<i>e</i>) <i>mun</i>
2PL	<i>shomā</i>	=(<i>e</i>) <i>tun</i>
3PL	<i>unā</i>	=(<i>e</i>) <i>shun</i>

Table 2.2: Persian strong (independent) and weak (clitic) pronouns

- (21) A: *rāmin* faqat be [MAN]_F ketāb dād.
 Ramin only to 1SG book gave.3SG
 ‘Ramin gave a book only to me.’
- B1: *sohrāb* ham faqat be [to]_F ketāb dād.
 Sohrab too only to 2SG book gave.3SG
 ‘Sohrab, too, gave a book only to you.’
- B2: # *sohrāb* ham faqat beh=*et* ketāb dād.
 Sohrab too only to=2SG book gave.3SG

In B’s reply to A, the nuclear pitch accent is located on the subject *sohrāb* ‘Sohrab’. The object of the preposition *be* ‘to’ must, as in B1, be the strong pronoun *to* ‘you (sg.)’. If instead it is the weak enclitic pronoun *=et*, as in B2, the VP sister of *faqat* does not contain a focus, resulting in infelicity.

We can probe the obligatoriness of associated foci in another way. As a number of authors have observed (Jackendoff 1972:251, Krifka 1992b:234, Aoun and Li 1993:206) and Beaver and Clark (2008:161–176) discuss in great detail, it is impossible to extract the focus associated with *only*. Relativizing, for instance, on the internal argument of *stock* in (22) is infelicitous.

- (22) # [KIM’S]_F is the tank I said I only stock ___ with clownfish.
 Intended: ‘I said I stock Kim’s and no other tank with clownfish.’
 (Beaver and Clark 2008:162)

(22) fails to satisfy the distributional restriction on focus in (5) since, even though the DP *Kim’s* is in focus, it is not located within the sister of *only*. Nor is there any other focused element in the VP. The same thing can be show for a variety of extraction constructions, including topicalization (23a), inverted pseudoclefts (23b), and *it*-clefts (23c).

- (23) a. # [FISHsticks]_F, I believe Kim only buys ____.
 Intended: ‘I believe that Kim buys fishsticks and nothing else.’
- b. # [GUinness]_F is what I think Kim only wants to drink ____.
 Intended: ‘I think Kim wants to drink Guinness and nothing else.’
 (Beaver and Clark 2008:165)
- c. # It’s [KIM’S tank]_F that I said I only stock ___ with clownfish.
 Intended: ‘I said I stock Kim’s and no other tank with clownfish.’

An identical pattern of infelicity is observed with *even*. To see this, it must be adjoined to a constituent other than the VP. When *even* is adjoined to a DP subject, the focus cannot be extracted in a relative clause (24a), through topicalization (24b), in an inverted pseudocleft (24c), or in an *it*-cleft (24d).

- (24) a. # [KIM'S]_F is the tank I said I stock even ___ with clownfish.
 Intended: 'I said I stock Kim's tanks with clownfish; moreover, it is the least likely for me to stock with clownfish.'
- b. # [FISHsticks]_F, I believe Kim feeds even ___ to her children.
 Intended: 'I believe that Kim feeds fishsticks to her children; moreover, they are the least likely thing for her to feed to her children.'
- c. # [GUinness]_F is what I think Kim wants to serve even ___ at her party.
 Intended: 'I think Kim wants to serve Guinness at her party; moreover, it is the least likely for her to serve at her party.'
- d. # It's [KIM'S tank]_F that I said I stock even ___ with clownfish.
 Intended: 'I said I stock Kim's tanks with clownfish; moreover, it is the least likely for me to stock with clownfish.'

At this point, the ban on the extraction of associated foci is simply an empirical observation. I will not be attempting here to provide an explanation for it, though this is a necessary part of any complete theory of association with focus.

2.4 Two-place associating expressions

Only and *even* adjoin to a single phrase, and so they require the presence of at least one focus. What if an associating expression took two arguments? This is exactly what I propose adversative *but* and *let alone* are. They are two-place associating expressions that have two sisters and accordingly associate with two foci:¹³

- (25) a. Max plays not [viOLIN]_F but [Oboe]_F in the orchestra.
 b. Oswald hasn't climbed [the Berkeley HILLS]_F let alone [Mt. EVERest]_F.

Sometimes it might seem as if the one-place associating expressions *only* and *even*, too, can take two arguments, judging from the number of foci present:

- (26) In general, you need a pretty close copy to support a claim for copyright infringement. It is not a violation of copyright law to copy someone else's 'style' because copyright law does not protect [ideas]_F, only [an individual's expressions of those ideas]_F. (internet)

But *only* need not always occur with both of the foci flanking it in (26). It can, for instance, appear in a fragment answer, like (27), containing just a single focus.

¹³My, perhaps nonstandard, omission of commas in these examples is intended to head off any prejudice as regards their syntactic analysis.

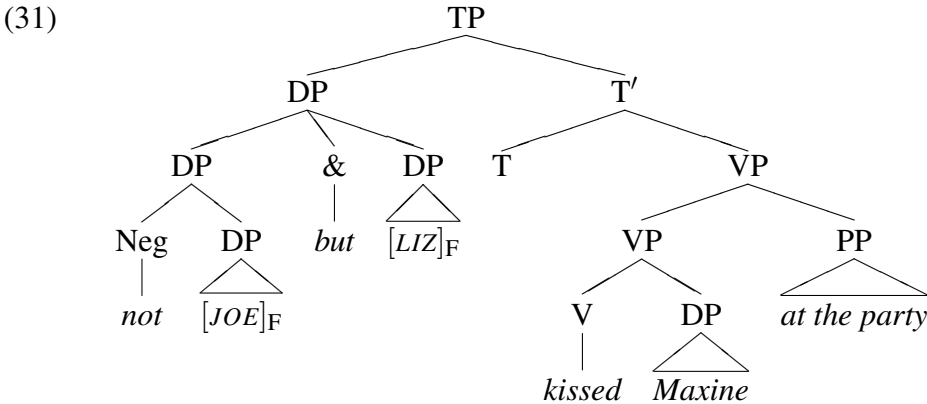
- (27) Q: Is the mayor corrupt?
 A: (No,) only [inCOMPetent]_F.

Adversative *but* and *let alone* are, in contrast, fundamentally binary. They can never appear in a fragment answer with just one of their foci:

- (28) A: Does Oswald play violin in the orchestra?
 B: *(No,) but [Oboe]_F.
- (29) Q: Has Oswald climbed the Berkeley hills?
 A: *(No,) let alone [Mt. EVERest]_F.

This is not surprising in light of their syntax. Both expressions are, I argue, coordinators and take two arguments of the same type. Adopting a tribranching structure for coordination, the sentence in (30) has the structure in (31).

- (30) Not [JOE]_F but [LIZ]_F kissed Maxine at the party.



The seemingly parallel sentence with *only* in (26) has a different structure. The *only* phrase is a supplement in the sense of Huddleston and Pullum (2002:1350–1362)—a fragment juxtaposed to a full clause.

The two foci associated with adversative *but* are obligatory. If they are omitted, and the sole focus of the sentence is located on the object, as in (32a), the result is infelicity.

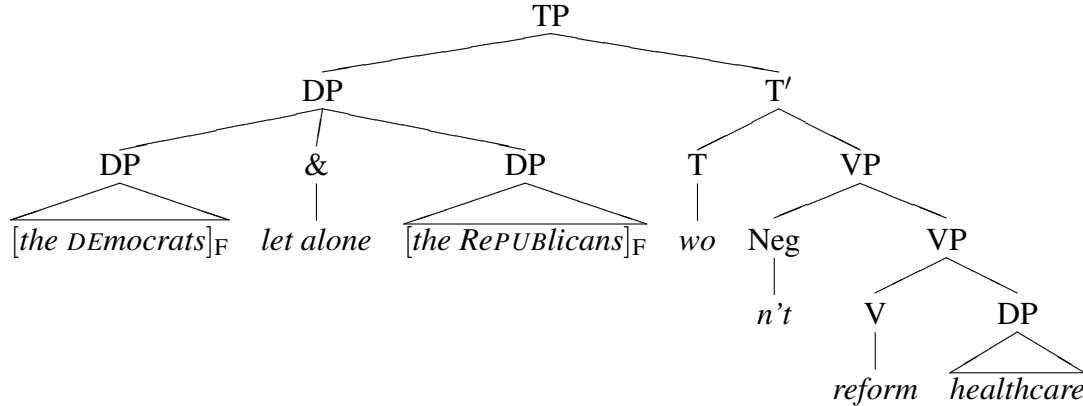
- (32) a. #Not Joe but Liz kissed [MAXINE]_F at the party.
 b. Joe and Liz kissed [MAXINE]_F at the party.
 c. Not [JOE]_F but [LIZ]_F kissed [MAXINE]_F at the party.

It is not that this intonational contour is ruled out with coordination in general since the parallel sentence in (32b) with a different coordinator is well formed. It is this focus structure that is problematic, and adding a focus to each *Joe* and *Liz*, as in (32c), makes the sentence good. (Compare this paradigm to the ones in (8) and (15).)

Like adversative *but*, I treat *let alone* as a coordinator. In (33), it combines two DPs, so that the sentence has the parse in (34).

- (33) [The DEMocrats]_F let alone [the RePUBLICans]_F won't reform healthcare.

(34)



Each of the DPs in (34) contains a focus that cannot simply be moved elsewhere in the sentence. If the only focus is located on *healthcare*, as in (35a), it is ill-formed.

- (35) a. #The Democrats let alone the Republicans won't reform [HEALTHcare]_F.
 b. The Democrats and Republicans won't reform [HEALTHcare]_F.
 c. [The DEMocrats]_F let alone [the RePUBLICans]_F won't reform [HEALTHcare]_F.

Other coordinators allow the same focus structure, such as *and* in (35b). Adding additional foci to both *the Democrats* and *the Republicans* makes the sentence felicitous (35c).

In second occurrence contexts, weak pronouns can be used, just as with *only* and *even*, to show that these foci are present. Even when they do not bear a pitch accent, these constituents cannot be realized as weak pronouns:

- (36) A: Sean talked to Caroline last week.
 B: I asked him whether he did, and he said that he didn't talk with [CAROLINE]_F but with [TOBey]_F last week.
 C1: You've got it all wrong. MIKE said that he didn't talk with [him]_F but with [her]_F last week.
 C2: # You've got it all wrong. MIKE said that he didn't talk with'er but with'im last week.

B's response to A sets up the second occurrence context in C's follow up. Neither *Caroline* nor *Tobey* can be realized as a weak pronoun, since then neither of the PP sisters of *but* would contain a focus. Similarly for *let alone* in (37).

- (37) Context: Mike and Sean are twins. Mike is shy, while Sean is quite outgoing. Two on-lookers, A and B, observe Mike refuse to play with another pair of siblings, Andrew and Andrea, while Sean happily offers both of them his toys. Later, the twins' mother asks: *How did the twins get along with the other kids?*
 A: Sean wouldn't play with [ANDrew]_F let alone with [ANDrea]_F at the party.
 B1: No, MIKE wouldn't play with [him]_F let alone with [her]_F at the party.
 B2: # No, MIKE wouldn't play with'im let alone with'er at the party.

The two DPs *him* and *her* in B1 resist being replaced by weak pronouns in B2, since then neither of *let alone's* arguments would contain a focus.

It is also possible to probe the presence of second occurrence foci in the Persian correlate of adversative *but*, *balke*. It does not allow either focus to surface as a weak pronoun:

- (38) A: sohrāb katāyun-o māch kard.
Sohrab Katayun kiss did.3SG
'Sohrab kissed Katayun.'
- B: sohrāb goft ke [katāYUN-o]_F māch na-karde balke [TO-ro]_F māch
Sohrab said.3SG that Katayun-OBJ kiss NEG-did.3SG but 2SG-OBJ kiss
kard.
did.3SG
'Sohrab said not that he kissed Katayun but that he kissed you.'
- C1: eshtebāh mikoni. rāMIN goft ke u [katāyun-o]_F māch na-karde balke
mistake do.2SG Ramin said.3SG that he Katayun-OBJ kiss NEG-did.3SG but
[to-ro]_F māch kard.
2SG-OBJ kiss did.3SG
'You're mistaken. Ramin said not that he kissed Katayun but that he kissed you.'
- C2: #eshtebāh mikoni. rāMIN goft ke u māch=esh na-karde balke māch=et
mistake do.2SG Ramin said.3SG that he kiss-3SG NEG-did.3SG but kiss-2SG
kard.
did.3SG

Balke in (38) coordinates two clauses embedded under *goft* 'said'. If the DPs *katāyun-o* 'Katayun' and *to-ro* 'you (sg.)' in C1 are replaced with weak pronouns, as in C2, there is no focus in either clause.

Extraction is, unfortunately, not as useful with the two-place associating expressions. Certainly, extraction of either focus associated with adversative *but* or *let alone* is impossible:

- (39) Q: Did you say that you stocked Kim's tank with clownfish?
A1: # [KIM'S]_F is the tank I said I stocked not ___ but [LYNN'S tank]_F with clownfish.
A2: # [LYNN'S]_F is the tank I said I stocked not [KIM'S tank]_F but ___ with clownfish.
- (40) Q: Of fish and squid, what did Sean say he doesn't eat on Sundays?
A1: # [FISH]_F is the thing that Sean said he doesn't eat ___ let alone [SQUID]_F on Sundays.
A2: # [SQUID]_F is the thing that Sean said he doesn't eat [FISH]_F let alone ___ on Sundays.

These facts are relatively straightforward, but there is a potential analytical confound. I argue that adversative *but* and *let alone* are both coordinators. As such, they should be subject to the Coordinate Structure Constraint, which Ross (1967:161) formulates as follows: 'In a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct.' If this island constraint can be independently motivated, then it would seem to make extraction useless as a probe for the obligatoriness of associated focus.¹⁴

¹⁴The Coordinate Structure Constraint might itself be a product of the focus structures of these sentences. Kehler (2002:101–142) argues, for instance, that, rather than a constraint on unbounded dependencies, the Coordinate Structure Constraint is a constraint on the parallelism of coordinate structures, something that might plausibly follow from restrictions on the focus structures of sentences containing adversative *but* or *let alone*.

2.5 A semantic typology

Associating expressions, whether they are one- or two-place, restrict the distribution of focus in much the same way. This is not an accident. There are systematic parallels in their meanings. *Only* and adversative *but* contrast the truth and falsity of alternative propositions, while *even* and *let alone* locate alternative propositions on a scale. These are parallels found not just with the expressions we have been considering but also with a range of other lexical item. Before turning to them, though, I want to develop the notion of an alternative a bit more.

If associating expressions make reference to alternative propositions, where do these alternatives come from? They come from the context, specifically from the issue under discussion in a given discourse. Questions are a good way of describing the conversational issue, and Roberts' (1996, 2004) question-under-discussion framework provides an explicit way of doing this. One purpose of conversation is the exchange of information. The goal of such exchanges, we might think, is to answer the big question *What is the way things are?*, a goal participants work towards by identifying a set of questions that are more manageable to answer. The questions that have been accepted by discourse participants as answerable, though not yet answered, are contained in the QUESTION–UNDER–DISCUSSION STACK, a set of questions ordered by when they were accepted onto the stack. When a new question is accepted, it is added to the top of the stack. When a question is answered, or determined to be unanswerable, it is popped off the stack. The topmost question is the QUESTION UNDER DISCUSSION.

A short example from Roberts 1996:12: Assume a model with two individuals, Hilary and Robin, and two foods, bagels and tofu. We can imagine the discourse in (41):

- (41) Q1: Who ate what?
 Q1a: What did Hilary eat?
 Q1a_i: Did Hilary eat bagels?
 Q1a_{ii}: Did Hilary eat tofu?
 Q1b: What did Robin eat?
 Q1b_i: Did Robin eat bagels?
 Q1b_{ii}: Did Robin eat tofu?

While the questions in the stack are ordered by precedence—Q1 was added to the stack before Q1a—this ordering is related to the questions' informativeness relative to one another. The complete answer to a question in the stack will contextually entail a partial answer to all preceding questions. Thus, the entire discourse in (41) ends up being a strategy to answer Q1, since a complete answer to each of the subquestions provides a partial answer to Q1. Answering both Q1b_i and Q1b_{ii} provides a complete answer to Q1b. And answering both Q1a and Q1b yields a complete answer to Q1, the superquestion *Who ate what?*

Alternatives, then, are just possible answers to the question under discussion. As we will see below, associating expressions evoke alternatives. They also provide a transparent way of talking precisely about question-answer congruence. Imagine we are at a potluck, and there are a variety of dishes set out, including bagels and tofu. By asking Q1a in (41), I am inquiring which of these Hilary ate:

	ONE-PLACE	TWO-PLACE
Additives	Nonscalar <i>also, as well, too, additionally, in addition</i>	Nonscalar <i>along with, as well as, in addition to</i>
	Scalar <i>even</i>	Scalar <i>let alone, much less, in fact, if not</i>
Adversatives	<i>instead</i>	adversative <i>but, instead of, rather than, so much as</i>
Exclusives	<i>only, just, merely, exclusively, solely</i>	

Table 2.3: Semantic typology of one-place and two-place associating expressions

- (42) Q: What did Hilary eat?
A: Hilary ate [BAGels]_F.

My interlocutor’s answer is congruent since my question asks about all the things that Hilary ate, and the focus in the answer is located on the constituent that refers to one of these things. Theories of focus formalize this notion of an alternative in different ways, as I discuss in Chapter 5, though all we need for now is an intuitive grasp of the concept.¹⁵

Associating expressions can either explicitly describe alternatives or quantify over them. This can happen in three basic ways, such that associating expressions form the typology in Table 2.3. It includes two categories from König 1991, the ADDITIVES and EXCLUSIVES, and I add a third, the ADVERSATIVES.¹⁶ I am aiming here for an overall landscape of associating expressions, so my treatment of individual lexical items will be somewhat superficial. I remedy this in Chapters 3 and 4, where I explore the meanings of adversative *but* and *let alone* in considerable detail.

¹⁵Briefly, in Rooth’s (1985, 1992, 1996a) alternative semantics framework, he assigns alternatives a primitive status where they serve as the semantic representation of focus itself. The structured meanings approach to focus (Klein and von Stechow 1982, Jacobs 1983, von Stechow 1982, 1991, Krifka 1992a,b) countenances alternatives only to provide the right meaning for *only* and other associating expressions (see, for instance, the discussion in Krifka 1992a:19).

¹⁶Beaver and Clark (2008:86–99) divide the one-place associating expressions into five groups, which, in addition to the additives and exclusives, include PARTICULARIZERS, DOWNTOWNERS, and INTENSIVES. The particularizers—*such as, for example, for instance, in particular, and specifically*—have meanings similar to the additives. They introduce an alternative that is more informative than some previously mentioned alternative. The downtowners come in two varieties. The minimizer downtowners, e.g. *kind of, barely, hardly, at the very minimum, to say the least, at the very least, and scarcely*, indicate that, while the sentence is compatible with what the speaker knows, a stronger, or more informative, statement may be true. Closely related are the maximizer downtowners, such as *at the very most, at most, at a maximum, and at best*, which serve to indicate that the sentence is the strongest true answer, though some more informative statement might have been possible. The intensives, which include *(most) importantly, significantly, especially, really, truly, fucking, damn, well, and totally*, serve to introduce a statement that is notable in some way. Fillmore et al. (1988:522 fn. 14) also note that *respectively* and *vice versa* bear some strikingly similarities to *let alone*. I leave for future research whether, and if so how, these expressions fit into the typology in Table 2.3.

2.5.1 Additives

The additives come in both one-place and two-place versions. The meanings of both can be represented schematically as follows:

- (43) *Additives*
One-place: $\phi \wedge \exists \mathbf{p}(\mathbf{p} \neq \phi \wedge \mathbf{p})$
Two-place: $\phi \wedge \psi$

One-place additives describe one alternative overtly (ϕ) and assert the existence of another true alternative. Two-place additives describe two distinct alternatives (ϕ and ψ).

The one-place additives include *also*, illustrated in (44), and *as well*, *additionally*, *in addition*, and *too*.

- (44) Up to 65 protesters were reported to have been burned to death when security forces set fire to a shopping center in which they were seeking refuge. Soldiers **also** shot at mourners burying the dead at two cemeteries in Bamako. (corpus)

Broadly speaking, according to Krifka (1992a:33), an *also* sentence conveys the conjunction of two propositions: the proposition derived by combining everything in the sentence except *also* and an existential statement. The existential statement of the *also* sentence in (44) is true since the soldiers set fire to a shopping center, in addition to shooting at mourners. The two-place versions of *also* include *as well as* (45), *in addition to* (46), and *along with* (47).¹⁷

- (45) CET is involved in the planning and implementation of a Mobile Home Care project with the Church of Ireland Missionary Society and Diocese of Mwanza, funded by WHO. This will help prevent the spread of infection in local Tanzanian villages **as well as** provide basic community care. (corpus)
- (46) The darker color of Scottish beer comes from the use of roasted barley or dark malt **in addition to** pale malt. (corpus)
- (47) The dehydrating effects of alcohol make her thirsty but instead of water, Liz drinks a tumbler of red wine. The combination of beer, whisky, and wine will increase Liz's chances of feeling ill the next day because the tannins in darker drinks, **along with** flavor enhancers and other chemicals, irritate blood vessels in the brain causing inflammation and pain. (corpus)

¹⁷Both *in addition to* and *along with* can occur sentence initially, preceding their first argument, as in (i) and (ii) respectively.

- (i) When Stravinsky composed *The Firebird* he used leitmotifs in yet another way. He created very distinctive passages of ascending chords to accompany the magic bird's flight through the trees. They accompany her every entrance. In contrast, he provided passages of descending chords for Kostchei. These two themes illustrate the conflict between life and death, love and hate, youth and age—all three topics being an essential part of any Russian fairy tale. **In addition to** the two leitmotifs, Stravinsky used traditional songs and dances backed by a mysterious rhythmic sound which helps to heighten the tension. (corpus)
- (ii) **Along with** jogging and swimming, cycling is one of the best all-round forms of exercise. (corpus)

It is not clear to me whether these instances of *in addition* and *along with* should be analyzed in the same way as the sentences in (46–47).

The semantics of these expressions are straightforward: they each express the conjunction of two alternatives. In (45), this is that CET's actions will help prevent the spread of infection and provide basic community care as well. In (46), the color of Scottish beer is attributed to two things: the use of dark malt and the use of pale malt. In (47), Liz's hangover is caused by tannins as well as flavor enhancers and other chemicals.

In addition to *also* and its one-place brethren, there are scalar additives that not only evoke two alternatives but also order them in some way. The sole one-place scalar additive in English is *even*, illustrated in (48).¹⁸

- (48) Stepping back, though, Bounds probably never expected Megyn Kelly to confront him with reality, or to call him out on his mendacity. If the McCain campaign's dishonesty is **even** turning off Fox News, the 'McCain lies a lot' narrative may be taking root after all. (internet)

The antecedent of the conditional in (48) says that the McCain campaign's dishonesty is turning off Fox News. The presence of *even* adds that there is some more likely proposition that is true. In context, this is that some other news network is being turned off by the McCain campaign's dishonesty. The two-place counterparts of *even* include *let alone*. We have already seen constructed examples, but a naturally occurring example might be useful at this point:

- (49) Diana was sympathetic, but did not fully understand his unrest, nor his frantic soul-searching. She was twenty-three and simply too young to comprehend the feelings of middle age—**let alone** those of a middle-aged Prince. (corpus)

(49) conveys that Diana was too young to comprehend the feelings of middle age. This is, however, more likely than comprehending the feelings of a middle-aged prince, which are no doubt more complex. The other two-place scalar additives include *much less* (50), *in fact* (51), and *if not* (52).

- (50) Now we have learned again that if we do not understand the places we invade, then the outcome will often be quite different than we imagined. Bush celebrated with a 'Mission Accomplished' when the mission had not even been defined, **much less** accomplished. (internet)
- (51) Some things always seem to run like clock work over here, trains for the most part are on time, given the sheer volume of people this is no small achievement. Another regularity are the constant power cuts and blackouts which place most, **in fact** all places we have been so far, outside Mumbai, in a perpetual wave of power on, power off. (internet)
- (52) At the first hotel I worked in, I had shared an 'office', with one other cleaner—a taciturn alcoholic who taught me how to keep my head down—but in my new job, there were five of us who shared the same poky little room. Consequently, first thing in the morning when we were all trying to get ready, we constantly got in each other's way. The atmosphere was, however, cordial, **if not** convivial, and the talk was of what grandchildren were up to or what Dr. So-and-so said about this or that particular problem. (corpus)

¹⁸Not all languages are so limited. there are, for instance, multiple one-place scalar additives in Greek (Giannakidou 2007), Spanish (Schwenter 1999, 2002), and Hindi (Schwenter and Vasishth 2001).

All three expressions evoke a scale, but they do so in different ways. *Much less* seems to be nearly identical to *let alone* (Fillmore et al. 1988:533). If, in (50), the mission had not been defined, it follows that it was not accomplished. But *in fact* and *if not* seem to order their two alternatives in the reverse order. The author of (51), while committed to the truth of most places experiencing intermittent power outages, conveys that something more informative might also be true—namely, that all places experience them. Similarly, in (52), while the atmosphere was cordial, it might also have been convivial.

2.5.2 Adversatives

Like the additives, the adversatives evoke two alternatives—but only one of them is true, the other is false.¹⁹ This is represented schematically in (53).

- (53) *Adversatives*
 One-place: $\phi \wedge \exists \mathbf{p}(\mathbf{p} \neq \phi \wedge \neg \mathbf{p})$
 Two-place: $\phi \wedge \neg \psi$

The sole one-place adversative I have been able to identify is *instead*. It describes a proposition that is true and expresses that there is at least one other alternative that is false. Consider the example in (54).

- (54) One of our bar staff recently came into the kitchen to ask if she could look in the soup kettle to see what color the soup was. ‘It’s green,’ I said. ‘It’s broccoli and ham.’ She then came back to tell me the customer didn’t like green so wouldn’t be having the soup. ‘What color did she expect broccoli and ham soup to be?’ I pondered. The customer ordered a salad **instead!** (corpus)

The author conveys that the customer ordered a salad, and in addition that there is something else that the customer did not order. In the context given, this is the broccoli and ham soup.

With the corresponding two-place adversatives, which describe two alternatives, negation may or may not be realized overtly. With adversative *but*, illustrated in (55), a negative element appears in its first argument.

- (55) The Shah had made a showplace of his country with his colossal purchasing of weapons, and look what it had all come to: ‘If you drive from Shiraz to Isfahan even today you’ll see hundreds of helicopters parked off to the right of the highway. Sand is gradually covering the inert machines.’ Shortly after the point at which the recital ends, sand was to cover some more helicopters—those sent by President Carter to liberate the American hostages seized in Teheran, where Kapuscinski catches a glimpse not of them **but** of their place of confinement. (corpus)

The author here denies that Kapuscinski saw the hostages themselves, asserting instead that he saw their place of confinement. There are a number of other expressions that fall into the same category as adversative *but*, including *so much as* (56), *rather than* (57), and *instead of* (58).²⁰

¹⁹This class of associating expressions has gone largely unnoticed in the literature, though Beaver and Clark mention *instead* (p. 92 fn. 22), calling it a ‘mixed nonscalar additive’. It is more perspicuously called an adversative since, rather than simply introduce another alternative, it opposes one alternative to the other.

²⁰Like *in addition to* and *along with* (discussed in fn. 17), *rather than* and *instead of* can occur sentence initially, as in (i) and (ii).

- (56) Many stoic, self-denying, modest straight men know the difference between volumizing conditioners and botanical ingredients. They are not gay or bisexual **so much as** ‘metrosexual’ and are led by British soccer star David Beckham, who sports sarongs and nail polish. (literature)
- (57) Most physicians know that we spend too much money towards the end of life. Too often we order tests that cannot provide information which will really help the patient. Too often we provide expensive therapies that do not really matter. Palliative care physicians focus on the patient **rather than** the diseases — making them fit Osler’s definition of a great physician. (internet)
- (58) In a paper published in the journal *Optics Express*, the IBM researchers detailed a significant milestone in the quest to send information between multiple cores — or ‘brains’ — on a chip using pulses of light through silicon, **instead of** electrical signals on wires. (internet)

Like adversative *but*, *so much as* occurs with an explicit marker of negation. In (56), this is sentential negation, so that the sentence as a whole denies that men who know something about conditioner are gay, and asserts instead that they are metrosexual. In contrast, *rather than* and *instead of* are not accompanied by an overt marker of negation, though they have a similar adversative function. In (57), it is the patient, as opposed to the diseases, that the palliative care physician focuses on. Similarly, in (58), IBM researchers used pulses of light to send information, not electrical signals. In what follows, I only consider adversatives like adversative *but* that occur with overt negation.

2.5.3 Exclusives

The best known associating expressions are, of course, the exclusives. These include *only*, as well as *just*, *merely*, *exclusively*, and *solely*. Their meaning can be given schematically as:

- (59) *Exclusives*
One-place: $\phi \wedge \forall \mathbf{p}(\mathbf{p} \rightarrow \mathbf{p} = \phi)$

A one-place exclusive conveys, for some proposition, that it is true and that, moreover, all other alternatives are false. Consider, for instance, the following:

- (60) Don’t bother taking antibiotics to treat your flu or cold; antibiotics do not kill viruses, and they should be used **only** for bacterial complications such as sinus or ear infections. (internet)
-
- (i) The violence in America is frightening. Homicides reached 23,000 in 1990, an increase of 15 per cent on the previous year. Drugs, poverty and the availability of hand guns all play their part. But **rather than** address these basic problems, politicians look for the quick ‘fix’ — anything that sounds good in a sound-bite will do. (corpus)
- (ii) In Scotland beer is usually served in a quite different fashion. Casks are placed on their ends in the cellar and a long tube known as an extractor is inserted through the tap hole. The extractor is connected to the bar pump by a plastic beer line. **Instead of** a handpump on the bar you will find a tall fount with a two-way lever. (corpus)

Whether the structure of these sentences is related to that of (57) and (58) remains for future research.

It conveys that antibiotics should be used for bacterial complications. They should NOT be used for anything else.

Conspicuously missing from Table 2.3 are any two-place counterparts to *only*. I think that, in some sense, we have already talked about them. While (59) is the usual logical form for *only*, its meaning can also be represented as (61), with the contrapositive of the second conjunct.

- (61) *Exclusives (alternate representation)*
 One-place: $\phi \wedge \forall \mathbf{p}(\mathbf{p} \neq \phi \rightarrow \neg \mathbf{p})$

The only difference between the meaning of a one-place exclusive (61) and a one-place adversative (53) is the force of quantification, a universal quantifier versus an existential quantifier. The two-place adversatives—adversative *but* and its kin—can be seen as instantiating the quantificational component of both these classes, since they describe one alternative that is true and another that is false.²¹

2.6 The big picture

We have seen so far that there is a larger class of expressions than was previously thought that restrict the distribution of focus. They fall into two categories: those that require the presence of a single focus, such as *only* and *even*, and those, like adversative *but* and *let alone*, that require two foci. This is, I contend, what it means to associate with focus.

This is not how the study of association with focus is usually approached. The literature on the phenomenon concentrates almost exclusively on *only* and *even*'s semantic interaction with focus. Take the following pair of segmentally identical sentences:

- (62) a. Max has only [MADE]_F sushi.
 ‘Max has made, and done nothing else to, sushi.’
 b. Max has only made [SUSHI]_F.
 ‘Max has made sushi, and nothing else.’

When focus occurs on *made*, as in (62a), we understand that Max did not do anything to sushi other than make it. When, instead, focus occurs on *sushi*, as in (62b), we understand that Max did not make anything other than sushi. This is a truth-conditional difference. Say that Max is a sushi chef: he makes a lot of sushi so he does not eat it at home. For a dinner party he is hosting, he makes sushi and a few other things (pad thai, tandoori chicken). In such a situation, (62a) would be true—Max indeed does not eat any sushi—while (62b) would be false. He does make something else besides sushi. This type of focus sensitivity is also a property of *even*, though since it is a bit harder to see I leave it for later.

The two-place associating expressions do not show the same semantic interaction with focus. It is not possible to change just the focus structure and get a different meaning. With the strings in (63) and (64), shifting focus from the main verbs onto the direct objects just results in infelicity.

²¹What would a universal one-place additive look like? It would express not only that some proposition is true but also that all distinct alternatives to it are true: i.e. $\phi \wedge \forall \mathbf{p}(\mathbf{p} \neq \phi \rightarrow \mathbf{p})$. Whether this is a gap just in English, or whether such an associating expression is unattested across languages, remains to be seen.

- (63) a. Max hasn't [MADE]_F sushi but [EATEN]_F sushi.
 'Max has not made sushi; he has eaten sushi.'
 b. #Max hasn't made [SUSHI]_F but eaten [SUSHI]_F.
- (64) a. Joe doesn't [EAT]_F chard let alone [GROW]_F chard.
 'Joe does not eat or grow chard; he is more likely to eat chard than grow chard.'
 b. #Joe doesn't eat [CHARD]_F let alone grow [CHARD]_F.

Focus is possible on the direct objects, of course, if the content of the sentence is itself modified, e.g. *Max hasn't made [SUSHI]_F but made [tanDORi]_F*. This is still different from *only* and *even*, which require no changes in content to get a different meaning.

In the rest of this dissertation, I aim to answer two questions. Why do all associating expressions restrict the distribution of focus? And, for the one-place associating expressions, why is their meaning affected by the position of focus? The answers to these questions lie in independently motivated aspects of these lexical items that we have already seen:

(i) *Crosscategoriality*

An associating expression can take subparts of the sentence as its argument.

(ii) *Multiple alternatives*

An associating expression evokes more than one alternative.

Both one- and two-place associating expressions are crosscategorial in their syntax. They are either adverbs with an extremely wide distribution or coordinators. And, all of the associating expressions evoke multiple alternatives, though they can do so in different ways. Association with focus arises, I contend, through the interaction of these two properties with the question under discussion.

I do not show how this works until Chapter 5, though. In the intervening chapters, Chapters 3 and 4, I treat the syntax and semantics of the two-place associating expressions. I am in particular concerned with showing that they have the two properties described above.

Chapter 3

The adversatives

Only's semantic interaction with focus is its most impressive property, one that, from the examples in (1–2), we might conclude adversative *but* does not share.

- (1) a. Max has only [MADE]_F sushi.
'Max has made sushi and done nothing else to it.'
- b. Max has only made [SUSHI]_F.
'Max has made sushi and nothing else.'
- (2) a. Max hasn't [MADE]_F sushi but [EATEN]_F sushi.
'Max has not made sushi; he has eaten sushi.'
- b. #Max hasn't made [SUSHI]_F but eaten [SUSHI]_F.

Moving the focus from the verb in (1a) onto the object, as in (1b), yields different truth conditions, even though the content of the sentence has not changed. The parallel adversative *but* sentences in (2a–b) do not allow the same variation. Relocating focus from the verb onto the object is simply infelicitous. The only way to make the focus structure in (2b) felicitous is to change the words, e.g. *Max hasn't made [SUSHI]_F but made [tanDORi]_F*.

While the contrast in (2a–b) seems clear-cut, there are some adversative *but* sentences where a change in just the position of focus does seem to lead to a different meaning:

- (3) a. Joe wants not for [LIZ]_F to meet his mother but [SUE]_F.
'Joe does not want Liz to meet his mother; he wants Sue to meet his mother.'
- b. Joe wants not for Liz to meet [his MOTHER]_F but [SUE]_F.
'Joe does not want Liz to meet his mother; he wants Liz to meet Sue.'

Imagine that Joe is dating Liz and Sue at the same time. Things have recently gotten quite serious between him and Sue. Joe wants to introduce Sue to his mother, though he does not, of course, want either of the women to find out about the other. In this context, (3a) is true, while (3b) is false. This similarity to *only* is, however, ultimately illusory. Adversative *but* does not have a semantic interaction with focus.

I have been careful to talk only about ADVERSATIVE *but*. This is important since *but* has other uses, which I set aside in §3.1. Having isolated adversative *but*, I go on to discuss its syntax in §3.2. It is a coordinator, though this might not be immediately apparent since, in some adversative

but sentences, gapping applies to the second coordinate, reducing it to a fragment. Gapping does not apply to all adversative *but* sentences, though, as I argue in §3.3. Some just involve small coordinates, where nothing goes missing. Support for my analysis comes from Persian. In §3.4, I show that the corresponding lexical item *balke*, has the same syntax, which it shows transparently as it does not permit gapping. The semantic variability we saw with English adversative *but* arises, I argue in §3.5, precisely because of gapping. It conceals the underlying structures of the sentences in (3), which are, in fact, different, so that they have different meanings. Before treating the semantics of adversative *but*, I consider the status of the negative element it cooccurs with in §3.6. Its semantics, to which I then turn in §3.7, are more straightforward. It conveys logical conjunction. Any impression that adversative *but* has a more involved meaning — such as expressing exhaustivity or serving a corrective function — arises pragmatically, possibly because of how adversative *but* interacts with the question under discussion.

3.1 Two types of *but*

The *Oxford English Dictionary* (second edition) distinguishes two senses of *but* (see also Anscombe and Ducrot 1977, Lang 1984:238–262, and Horn 2001:402–413):¹

23. As adversative conjunction, appending a statement contrary to, or incompatible with, one that is negated: On the contrary. = Ger. *sondern*.

24. Appending a statement which is not contrary to, but is not fully consonant with, or is contrasted with, that already made: Nevertheless, yet, however. = Ger. *aber*.

In its adversative use (subentry 23), *but* contrasts an explicitly negated statement with a positive one. The DENIAL-OF-EXPECTATION use of *but* (subentry 24), on the other hand, does not require the presence of negation (though it allows for it). Instead, one statement must give rise to an expectation that is violated (or denied) by a second statement.² With negation, as in (4), either interpretation is possible. When it is absent, as in (5), only a denial-of-expectation interpretation is possible.

- | | | |
|-----|--|--------------------------------------|
| (4) | Shaq isn't small but agile.
'Shaq is not small; he is agile.'
'Shaq is not small. Though he should not be agile, he is.' | adversative
denial of expectation |
| (5) | Shaq is huge but agile.
Not possible: 'Shaq is huge; he is agile.'
'Shaq is huge. Though he should not be agile, he is.' | adversative
denial of expectation |

The difference between these uses might seem to come down just to polysemy. But as the entry above suggests, some languages have distinct lexical items for each of them. As illustrated in (6),

¹There is also *but*'s exceptive use (subentry 25): e.g. *Everyone but Marion has fed Dudley*. It is quite different — both syntactically and semantically — from either of the two that I discuss here (see von Stechow 1993, 1994:143–187 for further discussion).

²Denial-of-expectation *but* has been argued to subsume an 'opposition' and a 'concessive' sense (cf. Lakoff 1971, Bellert 1972, Abraham 1979, Posner 1980, Slings 1980, Blakemore 1989, Foolen 1991, Winter and Rimon 1994, Sæbø 2003). These finer distinctions are not of relevance here.

German famously has *sondern* for the adversative function and *aber* for the denial-of-expectation function (Pusch 1975, Abraham 1979, Lang 1984:238–262). A similar distinction exists in Hebrew (Dascal and Katriel 1977) between *ela* and *aval* (7),³ in Spanish (Schwenter 2000, Vicente, to appear) between *sino* and *pero* (8), as well as in Persian between *balke* and *vali* or *amma* (9).⁴

- (6) a. Maria ist nicht dumm, **aber** sie ist hässlich.
 Maria be.3SG NEG stupid but she be.3SG ugly.
 ‘Mary is not stupid, but (nevertheless) she is ugly.’
 b. Maria ist nicht dumm, **sondern** hässlich.
 Maria be.3SG NEG stupid but ugly
 ‘Mary is not stupid, but (instead) ugly.’ (Kasimir 2006:108f.)
- (7) a. Hu lo kalkelan **ela** ish asakim.
 he no economist but man business
 ‘He is not an economist but a businessman.’
 b. Hu lo kalkelan, **aval** hu ish asakim.
 he no economist, but he man business
 ‘He is not an economist, but he is a businessman.’ (Dascal and Katriel 1977:144)
- (8) a. Julia no es alta **sino** baja.
 Julia NEG be.3SG tall but short
 ‘Julia is not tall but short.’
 b. Mario es bajo **pero** fuerte.
 Mario be.3SG short but strong
 ‘Mario is short but strong.’ (Schwenter 2000:295)
- (9) a. majid farānsavi ne-midune **balke** ālmāni midune.
 Majid French NEG-know.3SG but German know.3SG
 ‘Majid does not know French; he knows German.’

³Yaron McNabb kindly provided the interlinear glosses for the Hebrew examples.

⁴Lambton (1953:243) identifies a number of other senses for *balke*. In rhetorical questions, it conveys something like ‘on the contrary’ (i); in the absence of negation, it means ‘nay rather’ (ii); and clause initially, it can be interpreted as ‘perhaps’ (iii).

- (i) eshtebāh ya’ni che? balke felvāqe’ amdan in kār-rā kardeid.
 mistake it.means what but in.reality intentionally this deed-OBJ did.2SG
 ‘What do you mean, a mistake? On the contrary, you did it on purpose.’
- (ii) in ketāb chehel riyāl miarзад balke panjāh riyāl.
 this book forty rial be.worth.3SG but fifty rial
 ‘This book is worth forty rials, nay rather fifty rials.’
- (iii) balke āmade bāshad.
 but come be.3SG
 ‘Perhaps he has come (after all).’ (Lambton 1953:243)

In none of these uses does *balke* occur with negation. I leave for future research how they might be unified with the adversative function.

- b. majid farānsavi ne-midune **vali/amma** ālmāni midune.
 Majid French NEG-know.3SG but German know.3SG
 ‘Majid does not know French; though he should not know German, he does.’

By analogy to these languages, we can treat English as having two homophonous lexical items. In addition to their different meanings, they also differ in their distribution. Denial-of-expectation *but* is only available when the constituent following *but* is a predicate (10a) or a full clause (10b), not a DP (10c).⁵ Adversative *but*, in contrast, appears in all of these environments.

- (10) a. Shaq is huge but agile.
 b. Shaq is huge but he’s agile.
 c. #Shaq eats meat but tofu.
 Intended: ‘Shaq eats meat; though he should not eat tofu, he does.’
- (11) a. Shaq isn’t huge but agile.
 b. Shaq isn’t huge but he’s agile.
 c. Shaq doesn’t eat meat but tofu.

This flexibility is characteristic of coordinators. As we will see in the next section, adversative *but* displays a number of the other properties of coordinators.

3.2 The syntax of adversative *but*

Sentences with adversative *but* can be divided, following McCawley (1991, 1998:612–622), into two groups based on the position of negation.⁶ In BASIC FORM sentences like (12), negation immediately precedes the first focused constituent, which I call the CORRELATE. In ANCHORED FORM sentences like (13), on the other hand, negation appears in its canonical sentential position, at the left edge of the verb phrase (where it optionally cliticizes onto the auxiliary to its left). The second focused constituent, which follows adversative *but* in both types, I call the REMNANT.

- (12) Max plays **not** [Oboe]_F but [viOLIN]_F. basic form

⁵Larry Horn points out that denial-of-expectation *but* can have a DP follow it if *too* is present:

- (i) Shaq eats meat, but tofu, too.

Annahita Farudi suggests that *tofu* here is the remnant of gapping, and so would be derived from an underlying verb phrase or clause. Examples like (i) would thus collapse with (10a) or (10b). At any rate, adversative *but* does not require *too* in order to coordinate DPs.

⁶McCawley identifies a number of other adversative constructions that contain just negation: the ‘reverse short form’ (i), the ‘basic expanded form’ (ii), and the ‘reverse expanded form’ (iii).

- (i) John drank tea, not coffee.
 (ii) John didn’t drink coffee, he drank tea.
 (iii) John drank tea, he didn’t drink coffee. (McCawley 1991:190)

It is not clear to me how these sentence types should be analyzed, or whether they even bear a relationship to adversative *but*, so I will not have anything more to say about them here.

- (13) Max doesn't play [Oboe]_F but [violin]_F. anchored form

I treat adversative *but* as a coordinator since it behaves like more canonical coordinators, such as *and*. First, it is in complementary distribution with these other coordinators:

- (14) I fired again into the same spot. At the second shot he did not collapse **but** climbed with desperate slowness to his feet and stood weakly upright, with legs sagging and head drooping. (literature)
- (14') * At the second shot he did not collapse **and but** climbed with desperate slowness to his feet. . .

Second, both *and* and adversative *but* must occupy first position in the second coordinate, in contrast to connective adverbs like *moreover*, which otherwise look quite similar:

- (15) Lisa told me that it rained all week { **and** that they were short of food }
 *that they were **and** short of food }
 *that they were short of food **and** }
- (16) Lisa didn't tell me that it rained all week { **but** that they were short of food }
 *that they were **but** short of food }
 *that they were short of food **but** }
- (17) Lisa told me that it rained all week; { **moreover**, they were short of food }
 they were, **moreover**, short of food }
 they were short of food, **moreover** }

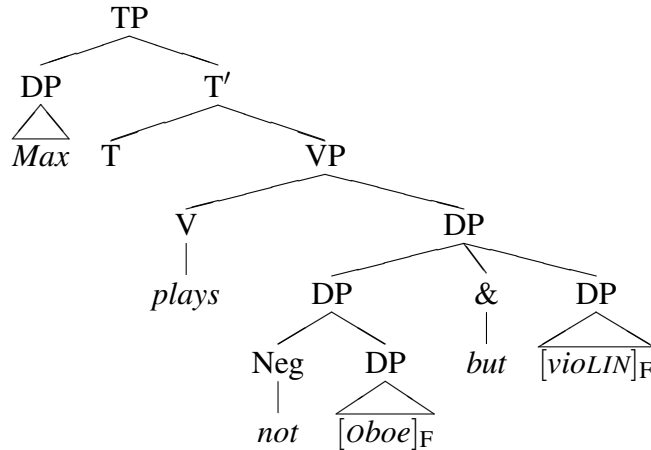
Finally, the second coordinate, and the coordinator along with it, cannot be fronted to sentence-initial position, either for *and* or adversative *but*:

- (18) a. He joined the club and the reading group.
 b. * And the reading group, he joined the club.
- (19) a. He didn't join the club but the reading group.
 b. * But the reading group, he didn't join the club.

As a coordinator, adversative *but* combines constituents of any type, not just clauses, as long as they are of the same type (Sag et al. 1985:117, Huddleston and Pullum 2002:1291). Adversative *but* should thus combine constituents that are not full clauses at least some of the time. This happens, I argue, in the basic form.

The sentence in (12) has the parse in (20). I continue to assume a simple ternary branching structure, though I do not see anything ruling out an asymmetric analysis like Munn's (1993).

(20)



If adversative *but* is a coordinator, then the correlate (along with the negative element), the remnant, and adversative *but* should form a single constituent. How do they fare with the usual constituency tests? The entire coordinate structure can be fronted together, as in (21). And, it can occur in the pivot of an *it*-cleft (22) or a pseudocleft (23).

- (21) Content with Hermia! No; I do repent / The tedious minutes I with her have spent. / **Not Hermia but Helena** now I love. (literature)
- (22) The Queen of Hearts is no longer making idle threats and when her minions are after Alice, it's **not wordplay but weaponplay** that's needed. (internet)
- (23) What is the evidence which impels Mr. Ellmann to defend 'Wilde's subtle effort' against Proust? As far as I know, what Wilde's bon mot aroused was **not Proust's indignation but his compassion**. (periodical)

I take negation to occur at the left edge of the first coordinate, signaling, in effect, the size of coordination. In its basic form, then, adversative *but* combines a wide variety of different constituent types:

- (24) Born in Romania (and thus sharing part of Leonard's eastern European background), transferred by his parents to Canada in the harsh years of the early century, he represents, perhaps more than any other, **not the genteel 'English' background common to many of his fellow-workers, but a rough, raw Canadian view that is intensely patriotic, proletarian, passionate and pure**. (corpus)
- (25) Shortly after the point at which the recital ends, sand was to cover some more helicopters—those sent by President Carter to liberate the American hostages seized in Teheran, where Kapuscinski catches a glimpse **not of them but of their place of confinement**. (corpus)
- (26) **Not one but two** former home secretaries have blamed television and films for what is happening in society. (corpus)
- (27) The tragedy of *The Changeling* is an eternal tragedy, as permanent as *Ædipus* or *Antony and Cleopatra*; it is the tragedy of the **not naturally bad but irresponsible and undeveloped** nature, caught in the consequences of its own action. (literature)

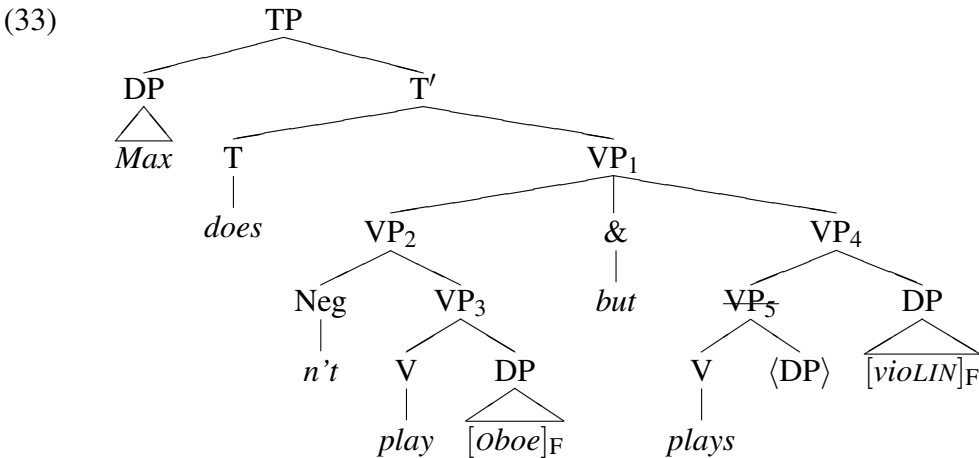
- (28) His decision to marry and give up his army career is made **not easily but painfully**, and it is made principally from his sense of duty to the woman. (periodical)
- (29) This is epitomized in the work of Alan Dershowitz (2002) who does **not condone torture but simply urges law to recognize that it happens** and, in an attempt to limit it in scope and in scale, to try to regulate torture through the use of a system of judicial warrants. (internet)
- (30) So if you are not a UK taxpayer you are advised **not to enter into Deeds of Covenant, but to make your regular charitable payments by simple Banker’s Order without any covenant**. (corpus)
- (31) But this rule is not so simple as at first sight it looks, for it means, **not that priority is gained by registration, but that it is lost through failure to register**. (corpus)

This includes two direct or oblique arguments (24–25), determiners (26), nominal or verbal modifiers (27–28), predicates (29), or nonfinite or finite embedded clauses (30–31). Everything, in fact, except for root clauses. This gap is filled by the anchored form.

In the anchored form, the remnant is smaller than we would expect from the position of negation. In (32), repeated from (13) above, negation occurs in its canonical sentential position at the left edge of the verb phrase. For negation to be contained within the first coordinate, adversative *but* would have to coordinate at least VPs. But the remnant consists of just a DP, *violin*.

- (32) Max doesn’t play [Oboe]_F but [viOLIN]_F.

This mismatch between the position of negation and the size of the remnant arises because the remnant is, I propose, the product of a phonological reduction operation, gapping. While adversative *but* coordinates two VPs in (32), everything in the second VP is deleted except for the DP *violin*:



Though the position of negation suggests a quite large coordination structure, gapping reduces the second coordinate to a fragment. This obscures its underlying structure, and makes it look more similar to the basic form than it really is.⁷

⁷It probably helps that this reduction seems to be obligatory, or at least highly preferred:

- (i) We don’t have [THREE]_F children but [FOUR]_F.
 (ii) * We don’t have [THREE]_F children but we have [FOUR]_F. (Horn 2001:404)

As a reduction operation that applies to the second coordinate (and, if present, all subsequent coordinates) of a coordination structure, gapping is most often studied in connection with *and* and *or*, though it has also been argued to apply to sentences with correlative coordinators such as *either ...or* (Schwarz 1999). Gapping always causes the finite verbal element (whether the main verb or an auxiliary) to go missing, and it leaves something behind. Often this is just a single remnant, but two, or even three, remnants are also possible:

- (34) a. Sarah left, and **Betsy** too.
 b. Some ate natto, and **others rice**.
 c. Nishi gave tongs to Melissa, **Will orchids to Carrie**, and **Vivek Marxist pamphlets to Stephanie**.

(Johnson 2004:1ff.)

Adversative *but* similarly allows more than one remnant. While most examples have just one, two remnants are also attested, as in (35). And, while I have not found any naturally occurring examples with three remnants, the constructed sentence in (36) is just as grammatical as (34c).

- (35) They have a ‘charismatic orientation’ toward this state; that is, they have a gift of the Holy Spirit. The kind of instruction given by Jesus—he did not give a command to all, but a **counsel to some**—is further evidence that celibacy is not for all. (internet)
- (36) A: Who did Sally want to give what to who?
 B: Sally wanted Nishi to give tongs to Melissa.
 C: Sally didn’t want **Nishi to give tongs to Melissa, but Will orchids to Carrie**.

Since the multiple remnants in (35–36) do not form a single constituent that can be coordinated, they must derive from a larger underlying phrase that is reduced by gapping.

Another characteristic of gapping is that it obeys island constraints (Hankamer 1979:20–21, Neijt 1979:23–24), as shown for the Coordinate Structure Constraint in (37a), for sentential subjects in (37b), for the Complex NP Constraint in (37c), and for adjunct islands in (37d).

- (37) a. *Alfonse cooked rice and beans, and Harry potatoes. (= ...and Harry ~~cooked~~ [~~rice and potatoes~~].)
 b. *That Alfonse ate the rice is fantastic, and Harry the beans. (= ...and [~~that Harry ate the beans~~] is ~~fantastic~~.)
 c. *Alfonse smashed the vase that Sonya had brought from China, and Harry from Japan. (= ...and Harry ~~smashed the vase~~ [~~that Sonya had brought from Japan~~].)
 d. *Jasper choked when he saw Sally, and Maria John. (= ...and Maria ~~choked~~ [~~when she saw John~~].)

These sentences are ungrammatical because one of the remnants originates inside an island. Since the island itself goes missing, these judgments are given relative to a certain interpretation. The sentence in (37a), for instance, is ungrammatical with the meaning in parentheses, which construes

Horn (2001:404) marks (ii) as completely ungrammatical, though many speakers I have consulted find it felicitous. While I myself would not rule (ii) out completely, it does seem more marked than its reduced counterpart in (i).

the remnant as part of the coordination *rice and potatoes*. The remnant in the anchored form also cannot originate inside any of the same islands (as Vicente observes (pp. 14–17) for complex NP and adjunct islands):

- (38) a. * Alfonso didn't cook rice and beans, but potatoes. (= ...but Alfonso cooked [~~rice and potatoes~~].)
- b. * That Alfonso ate the rice isn't fantastic, but the beans. (= ...but [~~that Alfonso ate the beans~~] is fantastic.)
- c. * Alfonso didn't smash the vase that Sonya had brought from China but from Japan. (= ...but Alfonso smashed [~~the vase that Sonya had brought from Japan~~].)
- d. * Jasper didn't choke when he saw Sally, but John. (= ...but Jasper choked [~~when he saw John~~].)

The anchored form sentences in (38) contrast with their basic form counterparts in (39).⁸

- (39) a. Alfonso cooked rice and not beans but potatoes.
- b. That Alfonso ate not the rice but the beans is fantastic.
- c. Alfonso smashed the vase that Sonya had brought not from China but from Japan.
- d. Jasper choked when he saw not Sally but John.

Gapping is not involved in the derivation of these latter sentences. The remnant in (39b) is simply the second member of a coordination structure that is contained within an island. There is consequently no island violation.

I treat gapping as movement of the remnant followed by deletion of the phrase evacuated by the remnant (Sag 1976, Jayaseelan 1990, Coppock 2001, Lin 2002).⁹ This was illustrated in (33), where the remnant *violin* raises and adjoins to VP₅. The sister of the remnant is then deleted under identity with the corresponding phrase in the first coordinate, VP₃. Generalizing from this structure, we can say that gapping deletes the TARGET phrase, the righthand boxed XP, just in case it is identical to the ANTECEDENT phrase, the lefthand boxed XP:

⁸Admittedly, (39a) is hard to parse with the intended interpretation, that Alfonso cooked rice and potatoes.

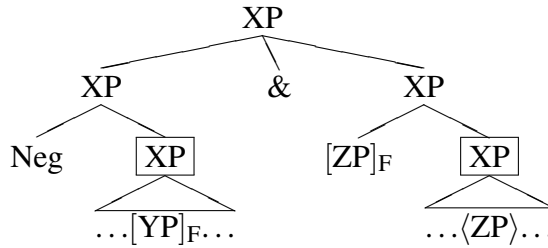
⁹Johnson (2004, 2009) proposes that the gap in gapping results not from deletion but from across-the-board movement of the verb phrase. I cannot see how to extend his analysis to adversative *but* since we would expect negation, contained within the first coordinate, to only ever surface to the right of the verb:

(i) * Max does [_{PredP} [_{VP} play ⟨DP⟩] [_{VP} [_{VP} not [_{VP} ⟨VP⟩ [_{Oboe}]_F]] but [_{VP} ⟨VP⟩ [_{violin}]_F]].

The remnant and correlate raise and adjoin to VP, the lower segments of which undergo across-the-board movement to Spec-PredP, a projection located immediately below TP. Since negation is adjoined to the first VP coordinate, it surfaces to the right of the verb and to the left of the correlate and remnant.

There are, of course, other analyses of gapping. Ross (1970) takes it to be nonconstituent deletion of everything but the remnants. This position is adopted by Hankamer (1973, 1979), Neijt (1979), van Oirsouw (1987), Wilder (1994, 1997), Hartmann (2000), and Hankamer and Depiante (2005), among other authors. Oehrle (1987) and Sag et al. (1985) provide a more straightforward alternative: the missing structure in a gapped clause is simply not there. Somehow, then, these subclausal constituents must be mapped onto a full proposition. I do not think data from adversative *but* allows us to distinguish amongst these possibilities.

(40)



The identity constraint imposed by gapping is morphosyntactic in nature: it is defined over the FORMS of the target and antecedent phrases. We see this in a number of different ways. Gapping does not allow the missing verb to differ from its antecedent in voice: active-passive mismatches are impossible.

(41) * The budget cuts might be defended publicly by the chancellor, and the president her labor policies. (= ...and the president might defend publicly her labor policies.)

(Johnson 2004:31)

Nor, as Johnson (2004:31f.) shows, can the antecedent of the gapped phrase be contained within a nominalization or be fashioned out of multiple preceding verb phrases. In these respects, gapping differs from the formally similar pseudogapping construction, which is usually analyzed as a type of verb phrase ellipsis and is subject to a SEMANTIC identity requirement (Merchant 2001). Nonetheless, the identity constraint must be able to ignore the copy of ZP left by movement and the focused correlate YP (Coppock 2001:138–141).¹⁰

Negation, when it is adjoined at the left edge of the first coordinate in (40), does not fall within the scope of the identity calculation. If it occurred within the antecedent phrase itself, gapping would be impossible, since the target phrase would fail to be identical to the antecedent phrase. This accounts for an unusual restriction on the anchored form. McCawley observes (p. 192) that the remnant in monoclausal sentences, such as (42), cannot be the subject. The subject of an embedded clause is not affected in the same way (43).

(42) * [JOHN]_F didn't win first prize but [MARY]_F.

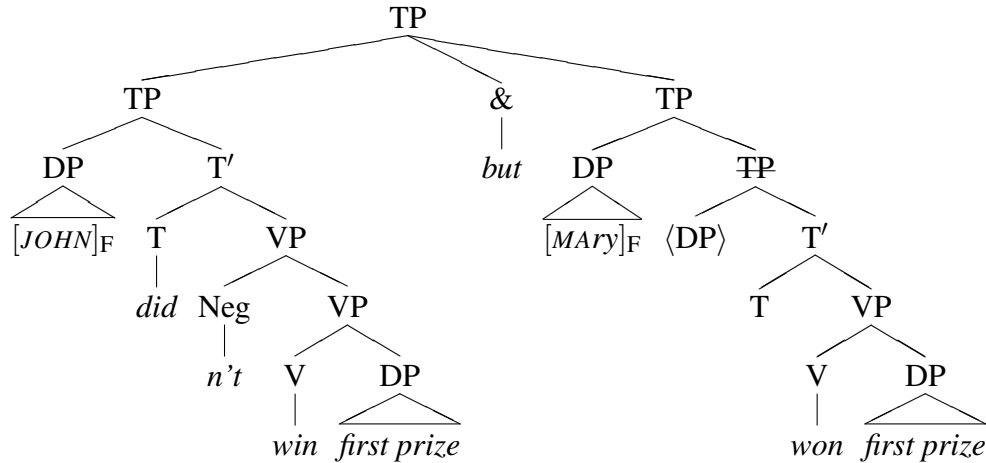
(McCawley 1991:192)

(43) I didn't say that [JOHN]_F won first prize but [MARY]_F.

When the remnant is an internal argument, what limits the size of coordination is the position of negation. When sentential negation adjoins to VP, adversative *but* can coordinate constituents as small as VPs. But in (42), coordination must be of TPs since the subjects of the two coordinates are distinct:

¹⁰The question, of course, is what constitutes their 'form.' Identity in gapping cannot be of phonological form since mismatches in the realization of tense, for instance, are tolerated. It must be something more abstract than this.

(44) *



With this parse, (42) is ungrammatical because the antecedent TP contains negation, and thus is not identical to the deleted TP. The complex sentence in (43) avoids this problem: since negation occurs in the matrix clause, adversative *but* can coordinate matrix VPs. Negation adjoins to the left edge of the first of these, and so it is not contained within the antecedent phrase. It therefore does not interfere with gapping.¹¹

3.3 A more abstract analysis

Under my account, there is nothing mysterious about (45), which I would treat as coordination of two DPs, *not a mathematician* and *a physicist*.

(45) Not a mathematician but a physicist discovered the neutron. (Vicente, to appear, 18)

But McCawley (1991) and Vicente (to appear) propose a relatively abstract analysis for adversative *but* in which the remnant—in both basic and anchored forms—derives from an underlying full clause. This is the structure I proposed for the anchored form, but the basic form sentence in (12) would, under their analysis, also have the parse in (46).¹²

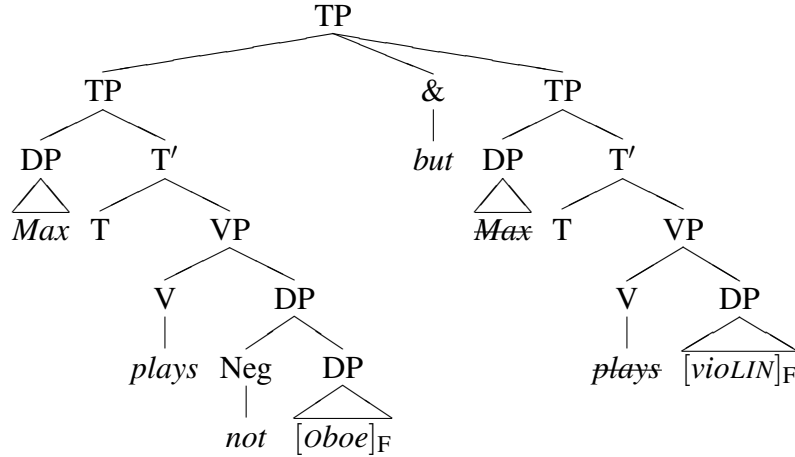
¹¹Kyle Johnson suggests that, if the subject were generated inside of a more articulated verb phrase, in Spec-vP, we would predict (42) to be grammatical. Since coordination could be just at the vP-level, the antecedent phrase would no longer contain negation, and gapping's identity condition would be satisfied. If this were a possible parse, we would have to look elsewhere to explain why (42) is ungrammatical. But I am not sure that it is a possible parse, since we would have to make two assumptions contrary to core principles of English syntax: i) A-movement of the first coordinate's subject DP can violate the Coordinate Structure Constraint; and ii) the second coordinate's subject DP can be licensed in situ, in Spec-vP. I see no reason to go in this direction if we can do without these assumptions and, at the same time, explain why adversative *but* does not allow subject remnants.

¹²Vicente offers only one piece of evidence against the small coordination analysis. He argues (p. 20) that, if adversative *but* coordinated two DPs, it would trigger plural agreement on the verb, which it does not:

- (i) Not a boy but a girl $\left\{ \begin{array}{l} \text{is} \\ \text{*are} \end{array} \right\}$ sunbathing on the lawn. (Vicente, to appear, 20)

But Vicente presupposes that we know how coordination with adversative *but* will affect verbal agreement. It is clear that, when two singular DPs are coordinated with *and*, the verb agrees in plural number. But since adversative *but*'s first coordinate is negated, it is not clear at all that it, too, should trigger plural agreement. The negative coordinator *neither...nor* requires singular agreement: *Neither a boy nor a girl is/*are sunbathing on the lawn.*

(46)



But, as Vicente discusses (pp. 18–21), basic form sentences like (45) would be mysterious under this analysis. How would the two clauses underlying the correlate and remnant be transformed into their surface representation? If gapping simply applied to the second coordinate, we would expect the surface form **Not a mathematician discovered the neutrino but a physicist*.

Vicente calls such sentences ‘adjacent initial-edge coordinations,’ following Bianchi and Zamparelli (2004), to distinguish them from more well-behaved basic form sentences. But neither Vicente nor Bianchi and Zamparelli provides a fully worked out analysis for ‘adjacent initial-edge coordinations,’ though they suggest three possible sources: i) gapping, ii) right node raising, and iii) (leftward) across-the-board movement.

The first option is the easiest to set aside. Gapping, if it is to derive sentences like (45), would have to apply to the first coordinate, removing everything but the correlate:

(47) [_{TP} Not a mathematician ~~discovered the neutron~~] but [_{TP} a physicist discovered the neutron].

In general, however, a gap that precedes its antecedent in a coordinate structure is ruled out by the Backwards Anaphora Constraint (Langacker 1969:171). While early work on gapping countenanced backwards gapping (particularly, in verb-final languages like Japanese), Hankamer (1979:103–123) shows that these gaps actually involve a different operation, right node raising.

What, then, about right node raising? It is usually analyzed as involving rightward across-the-board movement (Ross 1967:174–177, Hankamer 1971, Bresnan 1974, Postal 1974, and subsequent work). The sentence in (45) would thus have the parse in (48), where the VPs of the two TP coordinates right node raise to some sentence-final position.

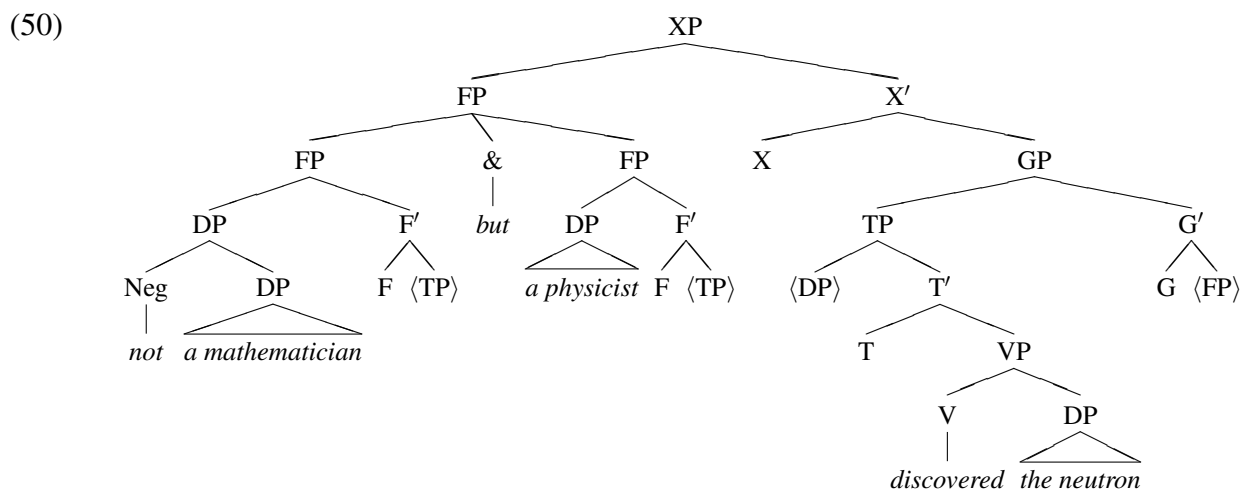
(48) [_{TP} Not a mathematician <VP>] but [_{TP} a physicist <VP>] [_{VP} discovered the neutron].

While perhaps plausible for this sentence, such an analysis cannot be extended to all basic form sentences. Crucially, the constituent that undergoes across-the-board movement must be a single constituent (Bresnan 1974:615). There are plenty basic form sentences where this would not be the case:

(49) Not one but two **former home secretaries have blamed television and films for what is happening in society.** (corpus)

Since the string following the remnant (in bold) is not a constituent, it cannot across-the-board move as a single unit. There is thus no parse of this sentence involving right node raising.

Bianchi and Zamparelli instead posit (p. 326) a more complicated derivation involving leftward across-the-board movement. Underlying (45) is the coordination of two F(ocus)Ps. The correlate and remnant first move to Spec-F(ocus)P of their respective coordinates. Then, the two TPs across-the-board move to Spec-G(round)P. Finally, the entire coordination, which now contains just the correlate and remnant, moves to the leftward specifier of the topmost projection (here, XP):



This analysis also fails to generalize to all basic form sentences. Since the entire coordination structure moves into the specifier of a left-peripheral projection, we expect adversative *but* only to show up in clause-initial position. But it frequently shows up sentence medially, as shown in (51), repeated from (27) above, and (52).

- (51) The tragedy of *The Changeling* is an eternal tragedy, as permanent as *Ædipus* or *Antony and Cleopatra*; it is the tragedy of the **not naturally bad but irresponsible and undeveloped** nature, caught in the consequences of its own action. (literature)
- (52) What was true, however, was that the *I.O.* was bound **not to but from** Guernsey, where she had loaded a goodly cargo of brandy and gin. . . (literature)

These alternative analyses fail because of the irreducible fact that adversative *but* occurs essentially anywhere in the sentence, a distribution that is entirely expected if it is able to coordinate constituents of any size.

3.4 Evidence from Persian

Under the analysis I propose, gapping applies independently to sentences with adversative *but*. It is not an intrinsic property of the construction. We consequently might expect there to be some languages that do not involve gapping and therefore show the size of coordination transparently. Persian is such a language.

Like its English counterpart, Persian *balke* has both a basic and an anchored form. In the basic form, constituent negation—the free morpheme *na*—occurs immediately preceding the correlate:

- (53) va garna, **na shomā, balke hameye dustān** midunand in rivyu az sāite
 and if.not NEG you but all friend.PL know.3PL this review from site
 DigiKala bud.
 was
 ‘And if not, not you but everybody knows that this review is from the DigiKala site.’
 (internet)
- (54) in ruzhā kamtar jā-yi-rā peidā mikoni ke dar qadam zadan-hā-yat barge
 this days less place-IND-OBJ find do.2SG that in step hitting-PL-2SG leaf
 zard-i-rā zire pā khord na-koni; barge zard-i ke be ruze
 yellow-IND-OBJ below foot piece NEG-do.2SG leaf yellow-IND that to day
 sabzi-ash, tohfe darvish bud va **na zire pā balke bālāye sare ādamiyān**
 greenness-3SG rarity dervish was and NEG under foot but above head human.PL
 jā dāsht.
 place had.3SG
 ‘You find fewer places these days where you can go walking without crushing yellow
 leaves underfoot, yellow leaves which in their green days were as rare as dervishes and
 had a place not under foot but above humans’ heads.’ (periodical)
- (55) bā “Search” dar sāite yād shode mibinand ke **na yek, balke se** vidio
 with in site memory become see.3PL that NEG one but three video
 az in qaziye mowjud hast.
 from this case available is
 ‘With “Search”, it can be seen in the archived sites that not one but three videos from this
 case are available.’ (internet)
- (56) tasviri ke az barme az do ruze pish dar resānehā zāher mishavand,
 image that from Burma from two day past in media appearance become.3PL
 digar **na zibā, balke sakht qamangiz** hastand.
 no.longer NEG beautiful but hard sad are.3PL
 ‘The images that have been appearing in the media for the past two days are not beautiful
 any longer but terribly sad.’ (internet)
- (57) va ba’d “ān negine soleimān”-rā ke **na gāhgāh balke hamishe** “bar u daste
 and after that stone Solomon-OBJ that NEG sometimes but always on it hand
 ahreman bāshad” be hich na-setānid?
 Ahriman is to nothing NEG-take.2PL
 ‘And then, do you take “that stone of Solomon’s” for nothing, which is not sometimes but
 always “on Ahriman’s hand”?’ (internet)
- (58) bā vojude gozashte zamān, hanuz ham tanhā vitrin-i ke tavvajoh-am rā
 with existence passing time still also only window-IND that attention-my OBJ
 jelb mikonad na vitrine kafsh ast va **na vitrine lebās, balke vitrine**
 arrest do.3SG NEG window shoe is and NEG window clothes but window
ketāb-furushi ast...
 book-seller is

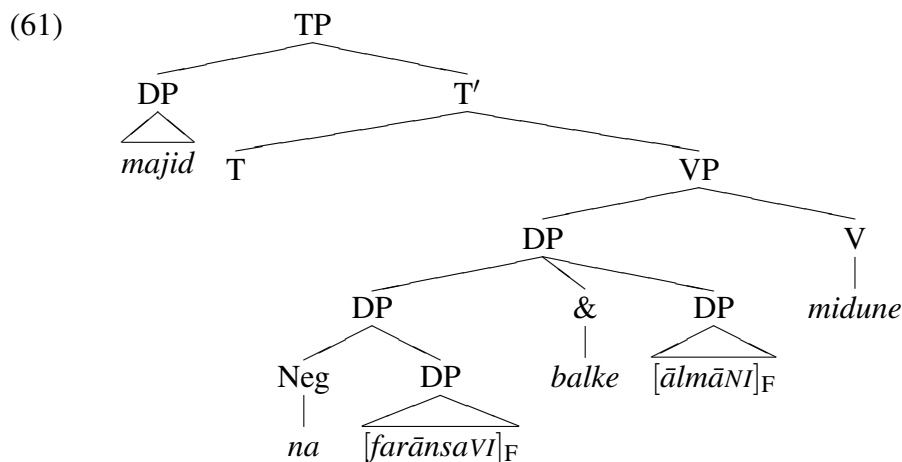
‘With the passing of time, the only (store) window that still grabs my attention is not the shoe window, and it is not the clothes window but the bookseller’s window.’ (periodical)

- (59) mitavānam beguyam bachchehā-yi ke aknun hastand va bar migardand va negāh
 can.1SG say.1SG child.PL-IND that today are.3PL and return.3PL and look
 mikonand va shohadā-rā mibinand hes mikonand **na ke māndand balke**
 do.3PL and martyrs-OBJ see.PL feeling do.PL NEG that stayed.3PL but
 ‘aqab māndand va barande na-shodand.
 behind stayed.3PL and winner NEG-became.3PL

‘I can say that the children today who return and look and see the martyrs feel not that they have stayed but that they have been kept behind and not won.’ (periodical)

Like other coordinators, *balke* combines a variety of different constituent types, including direct arguments (53), oblique arguments (54), determiners (55), nominal modifiers (56), verbal modifiers (57), predicates (58), and (finite) embedded clauses (59). Under the same analysis as for English adversative *but*, the basic form sentence in (60), which is parallel to the naturally occurring example in (53), has the parse in (61).

- (60) majid **na** [farānsavi]_F **balke** [ālmāni]_F midune.
 Majid NEG French but German know.3SG
 ‘Majid knows not French but German.’



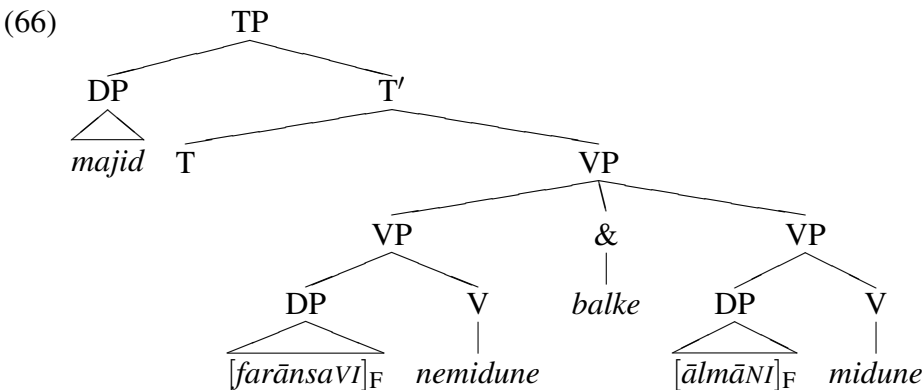
In the anchored form, negation occurs bound on the main verb. Depending on the verb, this can be *n-* (62), *ne-* (63), or *na-* (64).

- (62) hameye moshkelāte federāsyunhā māl-i nist **balke** bishtar
 all problem.PL federation.PL property-ADJ NEG.is but more
 modiriyat-i va barnāmehrizi ast va bāyesti be ānhā tavvajoh shod.
 administration-ADJ and planning is and must to those care become
 ‘All of the federations’ problems are not financial; they are more administrative and lo-
 gistical, and they must be taken care of.’ (internet)

- (63) lowhe āmādeye zehne kudak faqat bā āmuzesh sākhte **ne**-mishavad **balke**
 tablet ready mind child only with instruction built NEG-become.3SG but
 parvaresh lāzem dārad. . .
 nurturing need have.3SG
 ‘The tablet of a child’s ready mind is not made solely through instruction; nurturing is
 needed as well.’ (internet)
- (64) javhanhā barāye in afrāde shayyād be jang **na**-raftand **balke** barāye
 youth.PL for this individual.PL impostor to war NEG-went.3PL but for
 defā’ az keshvar va haq-eshun raftand.
 defense from country and right-3PL went.3PL
 ‘The youth didn’t go to war for these impostors but in order to defend the country and
 their rights.’ (internet)

The size of the coordinates here must be large enough to include the main verb. But since Persian allows null subjects, it is not clear whether they are VPs that do not include the subject or whether they are TPs with a null subject.¹³ I assume that in an anchored form sentence like (65), parallel to those in (62–64), *balke* coordinates just VPs:

- (65) majid [farānsaVI]_F **ne**-midune **balke** [ālmāNI]_F midune.
 Majid French NEG-know.3SG but German know.3SG
 ‘Majid doesn’t know French; he knows German.’



While gapping is generally available in Persian for other coordinators, such as *va* ‘and’ in (67), it does not apply to coordination structures with *balke*, for reasons that are not clear. The second coordinate in (68) cannot be reduced to a fragment.

- (67) majid farānsavi midune va ālmāni ham.
 Majid French know.3SG and German also
 ‘Majid knows French, and German too.’
- (68) *majid farānsavi ne-midune balke ālmāni.
 Majid French NEG-know.3SG but German
 Intended: ‘Majid doesn’t know French but German.’

¹³I assume that the subject in Persian raises to Spec-TP. This is to ensure that there is a structural position associated with verbal agreement. Karimi (2005:71–104) argues explicitly against this position, however, proposing instead that Spec-TP is reserved for topics. Adopting Karimi’s proposal would mean that *balke* coordinates VPs (or rather vPs).

Because Persian does not allow gapping with *balke*, it shows transparently the variable size of coordination, something that is obscured in English. Both languages have, judging from the position of negation, a basic and an anchored form, though the anchored form ends up having a very different surface realization in the two languages.

3.5 Return of the puzzle

If the underlying structure of the English anchored form reveals itself in the surface structure of Persian, then we can look to it to see whether *balke* exhibits a semantic interaction with focus. It does not:

- (69) a. *rāmin mixād na ke [VIS]_F mādar-esh-o māch bokone balke*
 Ramin want.3SG NEG that Vis mother-his-OBJ kiss do.3SG but
[mozhGAN]_F mādar-esh-o māch bokone.
 Mozhgan mother-his-OBJ kiss do.3SG
 ‘Ramin wants not Vis to kiss his mother but Mozhgan to kiss his mother.’
- b. #*rāmin mixād na ke vis [māDAR-esh-o]_F māch bokone balke mozhgān*
 Ramin want.3SG NEG that Vis mother-his-OBJ kiss do.3SG but Mozhgan
[māDAR-esh-o]_F māch bokone.
 mother-his-OBJ kiss do.3SG
 ‘Ramin wants not Vis to kiss his mother but Mozhgan to kiss his mother.’
- (70) *rāmin mixād na ke vis [māDAR-esh-o]_F māch bokone balke vis [mozhGAN-o]_F*
 Ramin want.3SG NEG that Vis mother-his-OBJ kiss do.3SG but Vis Mozhgan-OBJ
māch bokone.
 kiss do.3SG
 ‘Ramin wants not Vis to kiss his mother but Vis to kiss Mozhgan.’

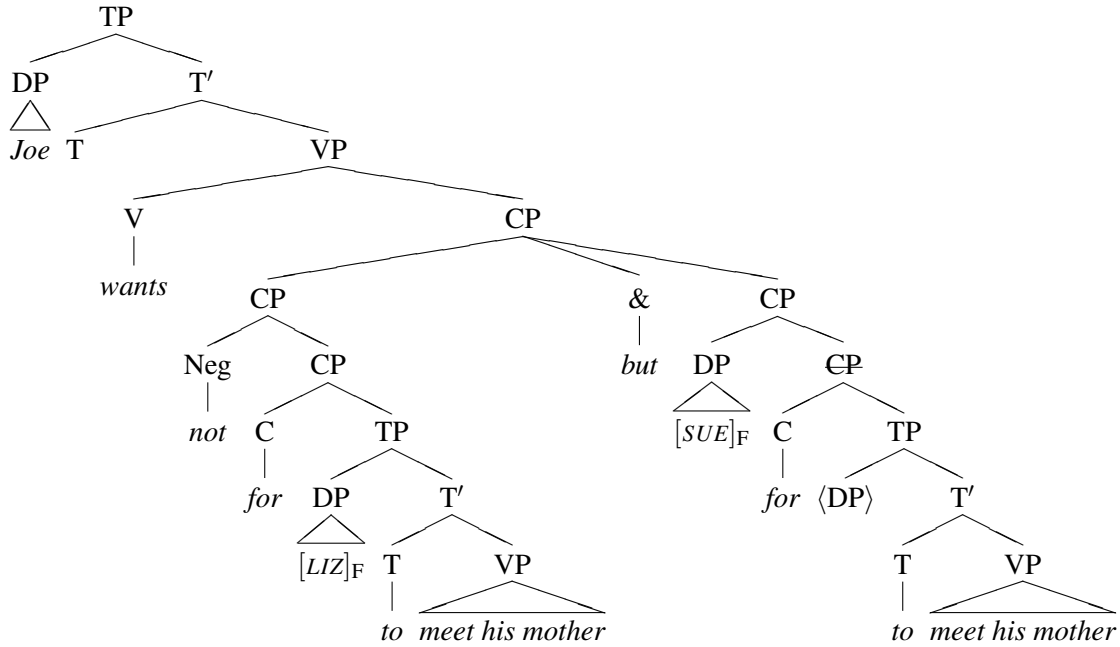
Just moving the foci on the subjects of each coordinate in (69a) onto the objects, as in (69b), is infelicitous. The reason is that the focused constituents are no longer different from each other. To get the desired meaning, we have to make them distinct, as in (70). But then this sentence differs from (69) in more than the position of focus.

Persian provides an insight into the pair of English sentences in (71), repeated from (3) above. While they may look identical on the surface, they have distinct underlying structures.

- (71) a. Joe wants not for [LIZ]_F to meet his mother but [SUE]_F.
 ‘Joe does not want Liz to meet his mother; he wants Sue to meet his mother.’
- b. Joe wants not for Liz to meet [his MOTHER]_F but [SUE]_F.
 ‘Joe does not want Liz to meet his mother; he wants Liz to meet Sue.’

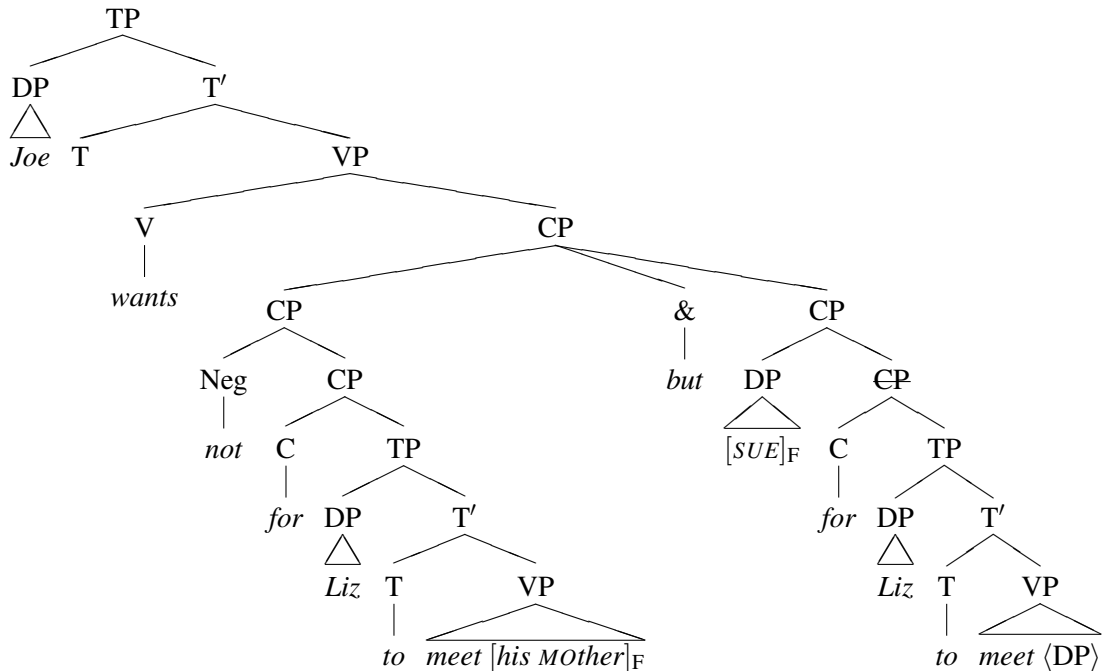
For both sentences, coordination must be at the level of the embedded TP. This allows negation, which adjoins to the embedded TP, to take scope just within the first coordinate. The remnant, however, is much smaller than this: it is just the DP *Sue*. Thus, (71a) must have the following structure, where gapping reduces the second coordinate to a fragment:

(72)



Since we construe the remnant DP *Sue* as the agent of the meeting event, it originates as the subject of the embedded clause, though subsequent deletion conceals this. In contrast, the remnant in (71b) originates as the object of the embedded clause, since we construe it as the patient of the meeting event:

(73)



Despite their surface similarity, (71a) and (71b) are actually parallel to the Persian sentences in (69a) and (70).

We can conclude, then, that adversative *but* does not exhibit a semantic interaction with focus of the type that arises with *only*. Any semantic variability derives from independent syntactic prop-

erties of adversative *but*. Why do adversative *but* and *only* differ in this way? I answer that question in Chapter 5.

3.6 The negative element

Before turning to the meaning of adversative *but*, I first want to take a closer look at the negative element that shows up with adversative *but*. In all the examples so far, it has been negation. But we find a range of other negative elements as well. When adversative *but* coordinates DPs, the first coordinate can contain negative determiners, such as *no* (74), *none of the* (75), or *neither* (76), as well as the negative correlative coordinator *neither...nor* (77).

- (74) Our appetite, turned loose on the world, would eat it all; our fears, if we ever wholly listened, would starve us to death. And the balance between them is **no mediation but an endless tug of war.** (literature)
- (75) Rather than subject himself and his family to further dialysis, tests, biopsies, operations, procedures and medications, none of which would reasonably have improved the quality of his remaining life, he opted for **none of the above, but instead a home setting for his final days and the care gracefully and lovingly provided by his daughter.** (internet)
- (76) While Sign English has characteristics of both ASL and English, it is **neither one, but a mixture of the two languages.** (literature)
- (77) By the midpoint of his shift, Tommy often begins to feel like Northampton's father confessor. . . Sometimes he seems **neither priest nor cop, but more nearly social worker,** a comparison he would resent. (literature)

When the coordinates are verbal projections, negative adverbs, such as *rarely* (78), *never* (79), and *no longer* (80), are available.

- (78) Stories come to us as wraiths requiring precise embodiments. Running seems to allow me, ideally, an expanded consciousness in which I can envision what I'm writing as a film or a dream. I **rarely invent at the typewriter but recall what I've experienced.** (periodical)
- (79) Her idea of a meal was saltines and tea, for all of them. She **never got hungry like ordinary mortals or realized that others could be hungry, but simply took in sustenance when the clock reminded her.** (literature)
- (80) To this day he seems, out-of-doors, a bit undressed when hatless, which in any case he rarely is, though he **no longer wears felt hats made by such firms as Dobb's or Stetson but instead dons the jauntier, more relaxed chapeaux of the kind befitting a man retired from the business wars** ('seamed all over with the scars of the marketplace,' as Henry James once characteristically put it). (literature)

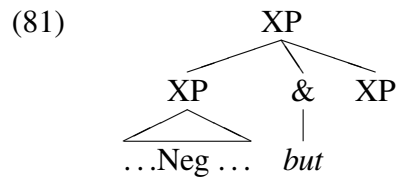
The negative elements that occur with adversative *but* are summarized in Table 3.1.¹⁴

¹⁴Horn (2001:392) observes that when the first coordinate contains incorporated negation, adversative *but* is ruled out. Thus, while in (i) free negation counts as a suitable licenser, the negative prefix of *irreligious* does not.

CLASS	ELEMENTS
adverbs	<i>rarely, scarcely, never, no longer,...</i>
coordinators	<i>neither...nor</i>
negation	<i>not</i>
quantificational determiners	<i>no, none of the, neither</i>

Table 3.1: Negative elements that occur with adversative *but*

I will not attempt to derive the obligatory presence of a negative expression with adversative *but*, though the relevant configuration is represented schematically in (81), where Neg is one of negative expressions from Table 3.1.¹⁵



A sentence containing adversative *but* is well formed just in case its first coordinate contains one of these negative elements. This constraint does not specify, though, where in the first coordinate the negative element must occur. In the preceding examples, it has always occurred at the left edge of the first coordinate. This need not be the case. In (82), coordination is at the T'-level and negation occurs adjoined to an oblique PP. In (83), adversative *but* coordinates VP and the negative determiner *no* is located within the object DP. And, in (84), it is embedded clauses that are coordinated, the first of which contains the VP-adjoined adverb *never*.

- (82) Having the backing of the U.S. government will help these nascent technologies receive commercial loans under reasonable rates. In addition, it's possible that some loans [T' will come **not** from commercial lenders] but [T' will be funded by the Treasury Department's Federal Financing Bank]. (internet)

-
- (i) Einstein's approach was { not religious
#irreligious } but rational.

This restriction remains to be explained.

¹⁵In some ways the relationship between adversative *but* and its negative element resembles that of a correlative coordinator like *either...or*. Two facts militate against treating adversative *but* as a correlative coordinator. First, while the first half of *either...or* is optional, e.g. *He plays (either) oboe or violin*, the negative element associated with adversative *but* can never be omitted. Second, correlative coordinators behave like a discontinuous lexical item since the identity of their two parts is fixed. In contrast, with adversative *but*, the negative element is drawn from a large class of elements. Alternately, we might think that adversative *but* is a negative polarity item. *Any*, for instance, is licensed in the scope of an appropriate licenser, usually a monotone decreasing function (Ladusaw 1980a). Adversative *but*, however, takes scope over the negative element it accompanies. This is most transparent in (85–87), where the negative element is clearly contained within the first of two coordinated TPs.

- (83) I shot marbles, traded baseball cards, owned a small electric train (an American Flyer), but none of these activities really lit my fire, let alone inflamed me with the kind of passion that is required to organize a systematic collection. Why? Like Virginia Woolf in this if no other wise, I [_{VP} had **no** room of my own], but [_{VP} grew up sharing a bedroom with my younger brother], and so I suppose there was not a great deal of extra room to store large collections. (literature)
- (84) Ackron refused to admit him, claiming that the brewers had the first mortgage. He then said [_{CP} that he had **never** owned the place], but [_{CP} that it was the property of his mother, Mrs. Archibald]. (periodical)

Even root clause coordination is possible, either with regular sentential negation (85) or another type of negative element, such as the VP-adjoined adverb *never* (86) or DP-coordination with *neither...nor* (87).

- (85) To illustrate what he means, Paul speaks of how this principle encroaches on his own rights. [_{TP} He does **not** claim his lawful wages], but instead [_{TP} he works with his hands] so as not to be a burden to his converts. (internet)
- (86) The presentation of the conflicts between Barth and Brunner and their interpretation is not complete without a renewed reference to the human closeness which existed between both of these men, even in this phase of discord. [_{TP} They were **never** content with the written debate], but rather [_{TP} they sought personal contact]. (internet)
- (87) In fact [_{TP} optimality involves **neither** *compromise* **nor** *suppression* of constraints], but instead [_{TP} it is built on (strict) domination of constraints in a hierarchy]. (literature)

Since negation is not the only negative element that licenses adversative *but*, the anchored form cannot be defined solely by the position of negation. We might say instead that in anchored form sentences the coordinated constituents are larger than the size of the remnant.

3.7 The semantics of adversative *but*

The rest of the chapter is dedicated to giving adversative *but* a meaning. I propose that the at-issue content of adversative *but* is nothing more than ordinary logical conjunction. But since it combines constituents of different categories, it needs a crosscategorial lexical entry. For the semantics of *and*, Partee and Rooth (1983) propose a meet operator, \sqcap , which they define recursively:

$$(88) \quad X \sqcap Y = \begin{cases} X \wedge Y, & \text{if } X \text{ and } Y \text{ are truth values} \\ \{\langle z, x \sqcap y \rangle \mid \langle z, x \rangle \in X \wedge \langle z, y \rangle \in Y\}, & \text{if } X \text{ and } Y \text{ are functions} \end{cases}$$

(Partee and Rooth 1983:364)

At the core of this definition is ordinary truth-functional conjunction (\wedge), whose model-theoretic interpretation can be represented by a truth table. When the meet operator's arguments are truth values, it is interpreted just like truth-functional conjunction. When its arguments are functions, however, the meet operator returns a function whose range is the meet of the two input functions' ranges. The meet operator is thus defined for functions whose range is the domain of truth values

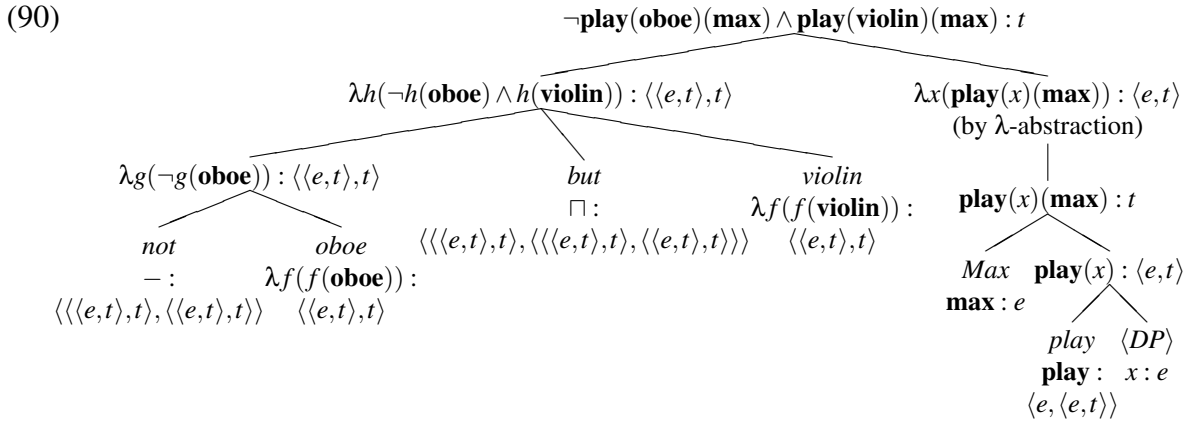
or, if the function is more complex, the innermost function's range is the domain of truth values. The meet operator eventually bottoms out, so to speak, in ordinary truth-functional conjunction.¹⁶ There is no provision for combining individual arguments (type e) directly, so DPs must be treated as generalized quantifiers (type $\langle\langle e, t \rangle, t\rangle$).

Since *not* adjoins to PPs, DPs, and a range of other categories, we need to give it a crosscategorical meaning as well. Let *not* correspond to the complement operator $-$:

$$(89) \quad -X = \begin{cases} \neg X, & \text{if } X \text{ is a truth value} \\ \{\langle y, -x \rangle \mid \langle y, x \rangle \in X\}, & \text{if } X \text{ is a function} \end{cases}$$

The semantics of the complement operator are parasitic on truth-functional negation (\neg), which has its usual truth-value-reversing semantics. When the complement operator takes a truth value as an argument, it has the same interpretation as truth-functional negation. When it takes a function as an argument, it returns a function whose range is the complement of the original function's range. By introducing the complement operator recursively in this way, regardless of the type of the function (so long as the range of the innermost function is the domain of truth values), it is equivalent to logical negation.

Neither the meet nor complement operators has any provision for taking an individual argument (type e). All DPs must therefore have denotations available in the domain of generalized quantifiers—functions from sets of entities to truth values—either as their basic meaning or through type shifting (Partee 1986). The adversative *but* phrase in *Max plays not oboe but violin*, since it is in object position, must raise to be interpreted, so that this sentence composes as follows (ignoring intensionality for convenience):



Interpreted as a generalized quantifier, the DP *oboe* denotes the set of sets containing the oboe. Negation returns the complement of this set: the set of sets that do not contain the oboe. The entire coordinate structure raises, leaving behind a variable of type e that is later abstracted over. This produces the right meaning: negation takes scope over the entire first conjunct, even though syntactically it only adjoins to a DP.¹⁷

All a sentence like (91) conveys under my account is the conjunction of two propositions in (92).

¹⁶A function from D_σ to D_τ (the domain of type σ to the domain of type τ) denotes a set of ordered pairs whose first member is a member of D_σ and whose second member is a member of D_τ .

¹⁷Alternately, a negated DP could denote a choice function that has as its domain the set of individuals that are nonidentical to the DP itself, i.e. $\llbracket \text{not } \alpha \rrbracket = \mathcal{F}(\lambda x(x \neq \llbracket \alpha \rrbracket))$. Since \mathcal{F} must be existentially bound, the first coordinate

- (91) Max plays not [Oboe]_F but [viOLIN]_F.
 (92) $\lambda w(\neg \text{play}_w(\text{oBoe})(\text{max}) \wedge \text{play}_w(\text{violin})(\text{max}))$

Is this really all there is to the meaning of adversative *but*? In the next sections, I consider two common intuitions about the meaning of adversative *but*, which I set aside in favor of the more minimal account proposed here.

3.7.1 Exhaustivity

Kasimir (2006:129f.) suggests that, in addition to conjoining two propositions, adversative *but* conveys that the second one comprises an exhaustive answer to the question under discussion. A sentence like (91), then, not only entails that Max does not play oboe and that he plays violin, it also entails that he plays nothing other than violin:

- (93) $\lambda w(\neg \text{play}_w(\text{oBoe})(\text{max}) \wedge \text{play}_w(\text{violin})(\text{max}) \wedge \forall x(x \neq \text{violin} \rightarrow \neg \text{play}_w(x)(\text{max})))$

In an out-of-the-blue context, (91) certainly seems to have an exhaustive interpretation. And I do not doubt that, in context, many sentences with adversative *but*, in fact, do. In (94), the author intends to convey that the billboard depicts a clenched fist and nothing else (not, for instance, a face).

- (94) The world’s most popular shoe corporation meets a coaching legend. The result: Billboards. And a dash of controversy. The billboards for a Nike campaign to promote its Nike L. A. line have come down, but the message lingers for many who saw not the face, but the clenched fist of Crenshaw High School basketball Coach Willie West, decorated with his three State Division I championship rings. (periodical)

But this does not mean that adversative *but* must entail exhaustivity. Without it, utterances are typically strengthened, so that while a given sentence might strictly speaking entail a partial answer to the question under discussion, it conversationally implicates, by the maxim of quantity, an exhaustive answer. There is evidence that the exhaustive interpretation of adversative *but* sentences is merely implicated, since it can be canceled:

- (95) Rodney’s father reckons that in the heat of the moment I referred to his son as a half-baked twit. Let me assure Rodney’s father that I never speak in the heat of the moment, particularly on such an auspicious day as this. The way I look upon it I am not losing a daughter but gaining a son. In fact I am also gaining a grandson. (internet)
 (96) The ‘cult of personality’? I know it is popular to underestimate the intelligence of the people, but let’s assume that most average persons have a rather good handle on assessing a candidate based not only on their words, but their deeds, in fact also their speech, in fact also, their demeanor. (internet)

of a sentence like *John play not oboe but violin* will entail that John plays something other than oboe. While this seems harmless in the context of adversative *but*—the second coordinate goes on to say what exactly this is—I wonder whether the existential entailment might cause problems elsewhere. On the other hand, this treatment of DP negation might also account for the intuition that constituent negation has an existential presupposition.

The author of (95) asserts that, when Rodney marries his daughter, he is gaining a son. This implicates that he is getting nothing else out of it, an implicature that he quickly cancels by saying that he is also gaining a grandson (Rodney's own son). Similarly, the author of (96) cancels the implicature that average people assess a candidate based solely on their deeds. They also evaluate their speech and demeanor. Thus adversative *but*, while it may implicate exhaustivity, does not entail it. There are, however, expressions that do so, to which we can look for comparison.

Only, for instance, is an explicit marker of exhaustivity. It has an at-issue component that expresses universal quantification, so that the sentence in (97) conveys the proposition that Max does not play anything other than violin. The sentence conveys another proposition: the prejacent, that Max does, in fact, play violin.

- (97) Max plays only violin.
 At-issue: $\lambda w \forall x (x \neq \mathbf{violin} \rightarrow \neg \mathbf{play}_w(x)(\mathbf{max}))$
 Prejacent: $\mathbf{play}(\mathbf{violin})(\mathbf{max})$

The universally quantified statement clearly comprises the main entailed meaning of an *only* sentence. It is, for instance, impossible to cancel this at-issue entailment (98) and speakers can contest it directly with *That's not true!* (99).

- (98) Max plays only violin. #In fact, Max plays something else as well.
 (99) A: Max plays only violin.
 B: That's not true! He plays oboe as well.

The status of the prejacent, on the other hand, is less certain. It has been treated as part of the at-issue content (Atlas 1991, 1993, Krifka 1992b), a presupposition (Horn 1969, 1996, von Stechow 1999, Geurts and van der Sandt 2004, Roberts 2006),¹⁸ an entailment that is not a presupposition but with a backgrounded status (Horn 2002, Beaver and Clark 2008:212–247), and a conversational implicature (McCawley 1981:226f., Horn 1992, van Rooij and Schulz 2007, Ippolito 2008).

The evidence that the prejacent has a secondary status relative to the at-issue entailment seems overwhelming. As Horn (1996:2f.) observes, it is the quantificational component of *only*'s meaning that determines the distribution of negative polarity items and the possibility of subject-auxiliary inversion:

- (100) Only young writers **ever** accept suggestions with **any** sincerity. (Klima 1964:113)
 (101) Only in Montreal **can die-hard film buffs** expect to see not only one but three films from Mongolia. (Horn 1996:3)

The negative polarity items *ever* and *any* are licensed in the verb phrase of (100), which maps onto the restriction of *only*, a downward entailing environment. The prejacent, which does not contain negation or any other monotone decreasing function, is upward entailing, and should fail to license negative polarity items. And, in (101), *only* can trigger subject-auxiliary inversion, a property of negative expressions, which are nowhere present in the prejacent.

¹⁸There are actually two different variants of the presupposition account. In the first, represented by Horn (1969) and Roberts (2006), *only* presupposes the prejacent itself. In the second, represented by Horn (1996), von Stechow (1999), and Geurts and van der Sandt (2004), *only* presupposes an existential statement. For (97), this would be that Max plays something. Combined with the at-issue entailment, this entails that Max plays violin.

What precisely the prejacent's secondary status consists of is not entirely clear. It does not really seem to be a conversational implicature since it cannot be canceled:¹⁹

(102) Only Lucy can pass the text. #In fact, even Lucy can't. (Roberts 2006:11)

Instead, we might think that, given its backgrounded status, the prejacent is a presupposition. And, indeed, it seems to behave like one in at least one way. The prejacent projects through presupposition holes like negation:

(103) It's not the case that only Lucy came to the party. (Roberts 2006:8)

Whenever (103) is true, it must also be true that Lucy came to the party. The at-issue content, as we might expect, does not survive negation. (103) entails that someone other than Lucy came to the party.²⁰

But the prejacent differs from most other presuppositions in other ways. To start with, whereas presuppositions are usually already part of the common ground, the prejacent of *only* is typically new information. Moreover, unlike most other presuppositions, the truth of the prejacent seems to be independent of that of the at-issue entailment. If the prejacent of (97) is false in some situation, that does not make it impossible to ascertain the truth or falsity of the at-issue entailment.²¹ For this reason, I follow Horn (2002) and Beaver and Clark (2008:244ff.) in treating the prejacent of *only* as an entailment that is somehow backgrounded. This is admittedly vague, but what is important is that the prejacent is nonetheless an entailment of *only* sentences, even though it might have a secondary status.

Going back now to Kasimir's proposed semantics for adversative *but*, we saw that it would have assigned to adversative *but* essentially the same meaning as *only* has. Both would have entailed that some proposition is true, and that all alternatives to that proposition are false. But, as we saw above, this cannot be right. Adversative *but* does not have this universal component of meaning. An exhaustive interpretation, which can be canceled like other conversational implicatures, arises through regular Gricean reasoning from the maxim of quantity. The exhaustive component of *only*'s meaning, on the other hand, is entailed and cannot be canceled.

¹⁹Proponents of the conversational implicature account rely on the fact that the prejacent can apparently, in some contexts, be suspended:

(i) Only Mary can speak French, and maybe not even she can. (Ippolito 2008:60)

Roberts (2006:10–15) observes, however, that the possibility of suspension relies crucially on the presence of the epistemic possibility modal *can*. Without it, suspension is impossible:

(ii) # Only Mary speaks French, and maybe not even she does.

This attempt at suspension in (ii) just yields a contradiction. Roberts proposes that the apparent suspension effect in (i) arises from widening the modals' domain between the *only* clause and the suspension clause. The second modal introduces a wider set of relevant facts for assessing the possibility that Mary speaks French.

²⁰The projection behavior of the prejacent is more sporadic with other presupposition holes. See the discussion in Roberts 2006:17–26 for why this is not problematic for the presupposition account.

²¹Roberts (2006:31f.) observes that this is because the truth conditions of the at-issue entailment do not in anyway make reference to the prejacent.

3.7.2 Correction

Another common intuition about adversative *but* is that it is ‘corrective’ in some sense. Horn (2001:402), for instance, writes that it provides ‘a straightforward way to reject **X** (on any grounds) and to offer **Y** as its appropriate rectification’ (see also Sgall et al. 1973:21ff., Pusch 1975, Abraham 1979, Lang 1984:238–261, Umbaugh 2004:171ff.). Horn has in mind exchanges like:

- (104) A: I love you.
B: You don’t [LOVE]_F me but [LIKE]_F me.

With the first half of her utterance, B rejects A’s assertion that A loves her, rectifying it with the second half, that A only likes B. The rejection, for Horn, originates in the negation, which he takes in this construction to be METALINGUISTIC. It enables the speaker to object to a previous utterance on any grounds, because of its content, phonetic form, morphology, presuppositions, conversational implicatures, register, or style. Some of the metalinguistic uses are illustrated below:

- (105) A: So, you [mɪ^ɪəniɪd] to solve the problem.
B: No, I didn’t [mɪ^ɪəniɪ] to solve the problem but [mæniɪd] to solve it.
(106) I didn’t manage to trap two **mongeese** but two **mongooses**.
(107) We don’t have three children but four. (Horn 2001:404)

In (105), B rejects A’s tensed pronunciation of *manage*, offering instead an untensed pronunciation. The user of (106) takes issue with an irregular plural for *mongoose*. And, in (107), the speaker disputes the conversational implicature generated by uttering *We have three children* (that they do not have four or more children).

McCawley (1991) argues, however, that adversative *but* does not always serve a metalinguistic function since it does not always occur after an utterance the speaker rejects:

- (108) ‘Well, Miss Woodhouse,’ he almost immediately began, ‘your inclination for dancing has not been quite frightened away, I hope by the terrors of my father’s little rooms. I bring a new proposal on the subject:—a thought of my father’s, which waits only your approbation to be acted upon. May I hope for the honor of your hand for the two first dances of this little projected ball, to be given, not at Randalls, but at the Crown Inn?’
(literature)

Frank Churchill asserts, before his interlocutor can say anything for him to object to, that the ball is not going to take place at Randalls (but rather at the Crown Inn). All he does is contrast two alternatives, saying that one of them is not true. This is nothing more than the ordinary truth-functional interpretation of negation. We see this even more directly, as Anscombe and Ducrot (1977:26) observe, when adversative *but* is used to answer a question:

- (109) A: (Of Max and me,) who do you love?
B: I don’t love [MAX]_F but [YOU]_F.

A does not make any sort of assertion for B's to correct. A simply asks for information, which B provides. For these reasons, I take the negation in adversative *but* sentences to be ordinary truth-functional negation. Just like other instances of negation, it can have a metalinguistic use, but there is nothing about adversative *but* that requires it.²²

3.7.3 Using adversative *but*

There is nonetheless a clear sense in which adversative *but* sentences do more than describe one negative proposition and one positive proposition. The propositions address a shared conversational goal. Concretely, we can say that the two propositions conveyed by an adversative *but* sentence must each answer the same question under discussion. Consider the following:

- (110) The work of a drama school is necessarily highly disciplined—and indeed self-discipline is an essential requirement in all acting. It is possible, though, that in the early stages of training you may feel that all your creative skill is being stripped from you, and that the whole system is ganging up on you. It's certainly true that the pressure on you builds up as the terms go on—but training is not designed **to destroy you, but to challenge you.** (corpus)
- (111) Why does Marmeladov drink? The *Crime and Punishment* notebooks expend considerable effort trying to establish an overarching reason or at least an empirical scatter of factors, and failing. Compare Dostoevsky's attempt, frustrated by the good angel of his genius, to explain Raskolnikov's motive for his crime. In the novel itself, where we might expect Marmeladov to speak of solace, respite, forgetting, companionship, he grasps the paradox that he drinks because he is in search of suffering, of 'tears and tribulation.' And, he adds, 'I have found them.' This has the same free, metaphysical bearing on his being a drunkard that Raskolnikov's wanting to dare has on his being a murderer. Moreover, as always in Dostoevsky, the search for suffering refuses to settle into coherent masochistic focus. Marmeladov's wife, he says, 'has a consumptive tendency, and I feel it. How could I not feel it? And the more I drink the more I feel it. Indeed that's why I drink, to find compassion and feeling in drink. It's not **happiness but sorrow** that I'm looking for. I drink because I want to suffer more and more.' (corpus)

In (110), the implicit question under discussion, evoked by the first sentence of the paragraph, is: *What is training designed to do?* The author rejects, in the end, the possibility that it is designed to destroy the student, and proposes instead that it is designed to challenge you. The question under discussion in (111) is announced by the author: *Why does Marmeladov drink?* That it is for happiness is rejected in favor of the answer that it is for sorrow.

We discussed earlier the semantic parallels between adversative *but* and its one-place counterpart *only*. There are also parallels in their use. Both meaning components of an *only* sentence serve to answer the same question under discussion:

²²The question then arises of how the truth-functional and metalinguistic uses of *not* are related. For Horn (2001), negation is 'pragmatically ambiguous,' though van der Sandt (1991) questions whether this even makes any sense. He treats it instead as a regular semantic ambiguity, though this solution, too, seems unsatisfying. A more promising approach, taken by Chapman (1996), Carston (1996), Geurts (1998), and Potts (2007), lies in the use of quotation to get ordinary negation to target aspects of an utterance other than truth-conditional content.

- (112) Chris Rogers, chair of statistical science at Cambridge University, said the only participants able to sell CLX-based products would probably be those who are too big to fail. ‘This is basically a kind of insurance product. The main issue is: how good is the party issuing it? If it’s going to be paying out huge numbers in the event of a crisis, will it be able to meet its obligations? Insurers can buy reinsurance for their liabilities, but the buck has to stop somewhere—there’s a limit to how much a private insurer can pay out. **Only the government** can cover unlimited losses,’ he says. (internet)
- (113) What Police Can Search for and Seize Under a Warrant
The police can search **only the place described in a warrant** and usually can seize only the property that the warrant describes. (internet)

In (112), Chris Rogers aims to answer the question *Who can cover enough losses to sell CLX-based products?* Both the at-issue entailment and the prejacent of the *only* sentence serve to answer this question. The at-issue entailment, that nobody other than the government can cover enough losses, excludes private insurers, for instance. And the prejacent, that the government can cover these types of losses, serves to answer the question exhaustively. Similarly, the *only* sentences in (113) occur in an information article about search warrants. The title of the section lays out exactly what the questions under discussion are: *What can police search for under a warrant?* and *What can police seize under a warrant?* If we take just the first *only* sentence, the at-issue entailment rejects searchable places other than those described by the warrant, and the prejacent specifies where the police can search.

3.8 Summary

I started with the observation that some adversative *but* sentences might have a semantic interaction with focus on par with the one exhibited by *only*. After a more detailed examination of its syntax—it is a coordinator—the relevant examples were revealed as a syntactic conspiracy of sorts. When adversative *but* coordinates verb phrases or clauses, the second coordinate is reduced to a fragment. Sentences with different underlying structures, and hence different meanings, can end up looking identical on the surface.

The meaning of adversative *but*, I argued, is not as complicated as one might think. All it expresses is logical conjunction. Previous authors have had two intuitions about its semantics that I set aside. First, adversative *but* conveys an exhaustive answer to the question under discussion. But this, I showed, is a conversational implicature that can be canceled. Second, adversative *but* is corrective in some sense. This, too, turned out to derive from nothing more than the fact that the negative element can have a metalinguistic usage.

While the at-issue entailment of an adversative *but* sentence consists of the conjunction of two propositions, as illustrated schematically in (114), they must answer the same question under discussion.

- (114) not ψ but ϕ
At-issue: $\neg\psi \wedge \phi$
- (115) only ϕ
At-issue: $\forall p(p \neq \phi \rightarrow \neg p)$
Prejacent: ϕ

Only shows the same orientation towards the question under discussion. Its two meaning components, schematized in (115), also answer the same question. In Chapter 5, I argue that the syntax and semantics of adversative *but* restrict the distribution of focus because of how they interact with the question under discussion. Now, though, I turn to a detailed study of the scalar additives.

Chapter 4

The scalar additives

In the previous chapters, we saw that one- and two-place associating expressions exhibit certain semantic parallels. The scalar additives stand in the same relationship to one another. The sole one-place scalar additive in English is *even*. Fillmore et al. (1988) describe in detail the syntax and semantics of *let alone*, the expression I argue is its two-place counterpart.¹ A *let alone* sentence like (1) might be roughly paraphrased as conveying that Oswald has not climbed the Berkeley hills and that, therefore, he also has not climbed Mt. Everest.

- (1) Oswald hasn't climbed [the Berkeley HILLS]_F let alone [Mt. Everest]_F.
- (2) Oswald hasn't even climbed [the Berkeley HILLS]_F.

The similarities to *even* are immediately apparent from the parallel sentence in (2). The inference we draw in (1)—that, if Oswald has not climbed the Berkeley hills, he has not climbed Mt. Everest—is, of course, not expressed overtly since *even* only mentions the Berkeley hills. Nonetheless, both could be used to answer a question like *Has Oswald climbed Mt. Everest?*

Despite this semantic commonality, *even* and *let alone* do not have the same distribution. While *even* occurs either in a negative environment, as in (2), or a positive one, as in (4), *let alone* is more selective. Removing the negation from (1) results in infelicity.

- (3) #Oswald has climbed [the Berkeley HILLS]_F let alone [Mt. Everest]_F.
- (4) Oswald has even climbed [the Berkeley HILLS]_F.

This behavior is, as Fillmore et al. remark (pp. 518f.), similar to that of negative polarity items like *any*, which require the presence of negation, or some other ‘negative’ element, in order to be felicitous. I argue, however, that while the contrast in (1) and (3) is real, it does not arise from a grammatical constraint. Rather, it arises from *let alone*'s interaction with the discourse context.

First, though, I treat *let alone*'s syntax in §4.1. Like adversative *but*, it is a coordinator that can combine essentially any two constituents of the same type. We might consequently think that *let alone* has the same at-issue content as *and*, a possibility that I explore in §4.2. But, as I discuss in §4.3, *let alone* conveys a presupposition relating two propositions by contextual entailment. This makes a conjunction analysis unnecessary, as I show in §4.4. Such an analysis, I argue in §4.5,

¹While this chapter builds on, it departs in significant ways from, my earlier work on *let alone* (Toosarvandani 2009a, 2009b, to appear). In some ways, it more closely approximates the analysis of Fillmore et al. (1988).

moreover predicts the wrong truth conditions for *let alone* sentences containing *barely*. With a semantics in hand, in §4.6, I move on to consider the possibility that *let alone* is a negative polarity item and only occurs in downward entailing environments. Drawing on naturally occurring data from rich and varied corpora, I show, however, that *let alone* occurs frequently in nondownward entailing environments. The nondownward entailing sentence in (3) is infelicitous, then, since in the same context as (1) *let alone*'s presupposition is not satisfied. In §4.7, I extend the semantic analysis of *let alone* to *even*, showing along the way why it does not exhibit a similar contrast.

4.1 The syntax of *let alone*

We first need to get a handle on *let alone*'s syntax. I recognize two types of sentences containing *let alone*, distinguished by the position of the remnant:²

- (5) a. [CLINTon]_F let alone [McCAIN]_F won't withdraw the troops from Iraq.
 b. [CLINTon]_F won't withdraw the troops from Iraq, let alone [McCAIN]_F.

In the APPOSITIVE REMNANT case in (5a), the remnant occurs immediately adjacent to the correlate. When the correlate sits in subject position, as it does here, the remnant ends up inside the sentence. In the FINAL REMNANT case in (5b), in contrast, the remnant appears at the end of the sentence.³

As Fillmore et al. observe (p. 414ff.), *let alone* behaves in many respects just like a coordinator.⁴ A canonical property of coordinators, as we saw in Chapter 3, is their ability to combine

²I treat *let alone* as a single lexical item, even though, morphologically, it is composed of two distinct words. Because it is semantically noncompositional, some speakers seem to have reanalyzed it in interesting ways:

- (i) On a more serious note though, I really feel like the internet is ruining new generations (as far as grammar goes). Many kids can barely write sentences **little-lone** paragraphs. (internet)
 (ii) I bet you've hardly even heard any SOAD, **little own** listened to it. (internet)

These authors' confusion about the internal structure of *let alone*, reflected in orthographic variants, recommends its status as a lexical item.

³Sentences where the correlate and remnant together occur sentence finally are ambiguous between the two types.

⁴They note (p. 515f.), however, that it does not pass the standard constituency tests. The hypothesized coordinate structure cannot be the pivot of a cleft or be topicalized:

- (i) *It's shrimp let alone squid that Max won't eat. (Fillmore et al. 1988:515)
 (ii) *Shrimp let alone squid Moisha won't eat. (Fillmore et al. 1988:516)

But neither clefts nor topicalization are information structurally innocent (see Prince 1978 and Ward 1988, 1990 respectively). They impose certain requirements on the discourse context. Whatever these are, it is possible that they might clash with the requirements of *let alone* itself.

For two other constituency tests, coordination and deletion, the *let alone* phrase does seem to form a constituent:

- (iii) Max won't eat rice and shrimp let alone squid.
 (11') Most policemen and women at Easton have not even drawn their guns, let alone fired it. The police at Bournemouth have not either.

There is an interpretation of (iii) where *let alone* takes just *shrimp* and *squid* as its arguments: if Max will not eat rice and shrimp then he will not eat rice and squid. Similarly, the elided verb phrase in (11') can be interpreted as anaphoric

constituents of different types. *Let alone* can coordinate direct or oblique arguments (6–7), determiners (8), nominal or verbal modifiers (9–10), one-place or two-place predicates (11–12), and nonfinite or finite embedded clauses (13–14).

- (6) We can go crazy with statistical versions of Venn Diagrams, but in short, **the City (let alone the State)** does not appear to be closing the Achievement Gap any differently than the national baseline. At least as far as black and white per the subject report. (internet)
- (7) Tonight’s competitors make a right dog’s dinner of their dishes. Actually, some of them you wouldn’t even give **to a dog, let alone to Michelin-starred chef Michel Roux Jr.** (internet)
- (8) Then, I realized with the new Seacliff Herringbone Diaper Tote (\$149) that Pottery Barn Kids sent over for me to try out, I’d only have one bag to check. The black herringbone cotton-canvas is so stylin’ that nobody suspects it holds **one, let alone two** tots’ essentials. (internet)
- (9) So we are faced with the amazing fact that neither the insistence on English superiority nor a savage level of English military aggression was enough to produce **widespread, let alone total**, resistance by a people who for well over two centuries had determinedly and successfully resisted both. (corpus)
- (10) Quasimusical philosophy is all very well, and often, as here, gives pause for thought, but it can hardly hope **practically, let alone fundamentally**, to affect the manner in which music is professionally performed. . . (periodical)
- (11) Contrary to what folk models of the RUC might lead one to expect, most policemen and women at Easton have not even **drawn their guns, let alone fired it.** (corpus)
- (12) One thing is certain — that a Darwinian-style, materialistic and linear, reductionist thought process cannot begin to **describe, let alone explain**, the integrated, complexly woven cycles and patterns of behavior and physiological process that we see around us. (corpus)
- (13) But even with videos from the store’s surveillance cameras and the accounts of witnesses, Lieutenant Fleming and other officials acknowledged that it would be difficult **to identify those responsible, let alone to prove culpability.** (periodical)
- (14) Dad, who died in 1989 at the age of 82, had no idea **that anyone even knew he existed, let alone that there were** FANS of his pulp covers and bubblegum cards. (internet)

Let alone has a number of other properties typical of coordinators. First, it is in complementary distribution with other coordinators: it cannot cooccur with *and* (13'). Second, *let alone* occurs only initially within the second coordinate, paralleling the distribution of *and* (13''). Finally, the second coordinate of a *let alone* sentence cannot be fronted to sentence-initial position independently of the first coordinate, as in (13''').

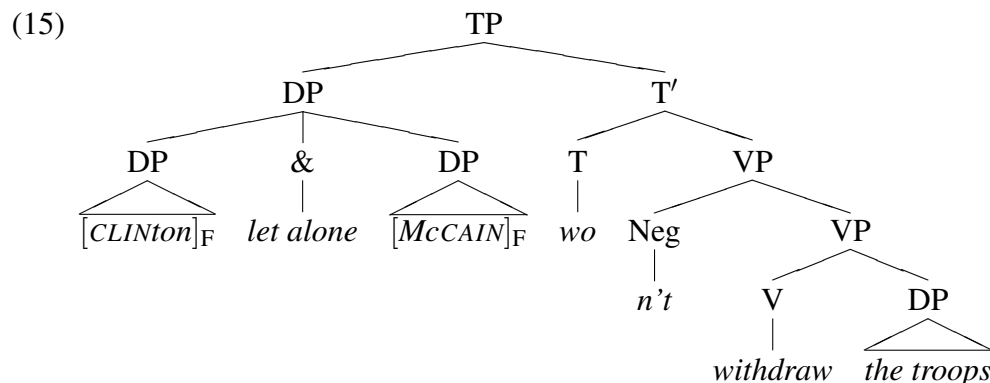
(13') * It would be difficult to identify those responsible, **and let alone** to prove culpability.

to an entire *let alone* phrase: the Bournemouth police, like their Easton colleagues, have neither drawn their guns nor fired them.

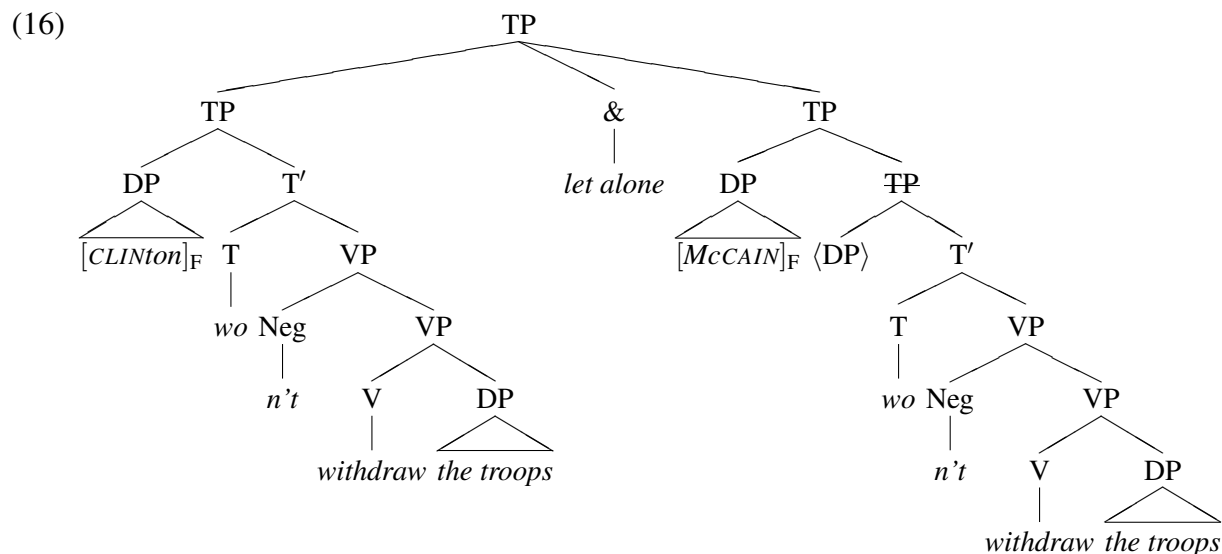
(13'') It would be difficult to identify those responsible, { *to prove **let alone** culpability }
 { *to prove culpability **let alone** }.

(13''') * **Let alone to prove culpability**, it would be difficult to identify those responsible.

The structure of appositive-remnant sentences is straightforward. The correlate and remnant are base generated as the two coordinates of a coordination structure. If, again, we assume a flat structure for coordination, the appositive-remnant sentence in (5a) receives the following parse:



Final remnant sentences have a more involved derivation. In particular, I propose, following the letter if not the spirit of Fillmore et al. (pp. 517f.), that the remnant occurs in sentence-final position because it derives underlyingly from a much larger constituent. In (5b), this is an underlying TP:



Since the remnant is a subject residing in Spec-TP, *let alone* must coordinate at least TPs. And, since everything in the higher TP is linearized before everything in the lower TP, the remnant in the second TP surfaces in sentence-final position.

If gapping is involved, we expect that multiple remnants should be possible in sentence-final position. This is indeed what we find: two remnants are possible (17), or even three remnants (18).⁵

⁵We expect, conversely, that multiple remnants should be impossible in appositive-remnant sentences, where gapping is not involved. But Fillmore et al. give a couple examples with seeming multiple sentence-medial remnants:

- (17) [GORbachev]_F wouldn't denounce [COMmunism]_F as the basis of the international economy, let alone [REAGan]_F [CAPitalism]_F.
- (18) I doubt [an A student]_F could teach [aRITHmetic]_F for a year [to THIRD graders]_F at this school, let alone [a C student]_F [CALculus]_F [to eLEventh graders]_F.

Beyond this surface resemblance, sentence-final remnants share another, behavioral, property with more canonical instances of gapping. They obey, for instance, island constraints. The remnant cannot originate inside of a sentential subject (19c), a coordinate structure (19b), a complex noun phrase (19c), or an adjunct (19d).

- (19) a. # That Alfonse ate the fish is doubtful, let alone the squid. (= ...let alone [~~that Alfonse ate the squid~~] is doubtful.)
- b. # Alfonse didn't eat the fish and rice, let alone the squid. (= ...let alone Alfonse didn't eat [the squid and rice].)
- c. # Alfonse wouldn't taste the cake his girlfriend made, let alone the stranger. (= ...let alone Alfonse wouldn't taste [the cake the stranger made].)
- d. # Jasper didn't choke when Mary kissed Sally, let alone John. (= ...let alone Jasper didn't choke [when John kissed Sally].)

These sentences are ungrammatical relative to an interpretation in which the remnant is contained within the island. The sentence in (19a), for instance, is ungrammatical when interpreted as saying that it is doubtful whether Alfonse ate the squid. Since the desired interpretation is not available in appositive-remnant sentences, gapping must only be involved in the derivation of final-remnant sentences.

- (20) a. That Alfonse ate the fish let alone the squid is doubtful.
- b. Alfonse didn't eat the fish let alone the squid and rice.
- c. Alfonse wouldn't taste the cake his girlfriend let alone the stranger made.
- d. Jasper didn't choke when Mary let alone John kissed Sally.

The sentence in (20a), for instance, conveys that it is doubtful both that Alfonse ate the fish and that Alfonse ate the squid. This is entirely expected if *let alone* does not coordinate full clauses, but just DPs.⁶

-
- (i) A poor man wouldn't wash your car, let alone a rich man wax your truck, for \$2, let alone for \$1.
- (ii) A poor man wouldn't wash, let alone a rich man wax, your car for \$2, let alone your truck for \$1.

(Fillmore et al. 1988:521)

Just like more canonical remnant-final sentences, these involve, I would argue, the coordination of full clauses, though their underlying structure is obscured because of the additional application of right node raising. In (i), for instance, after gapping has removed everything in the second coordinate except the subject DP *rich man* and the VP *wax your truck for \$2, let alone for \$1*, the adjunct PPs in each coordinate right node raise. A similar parse is available for (ii).

⁶Gapping seems to be obligatory with *let alone*. Realizing the full underlying structures of the sentences in (17–18) is ungrammatical:

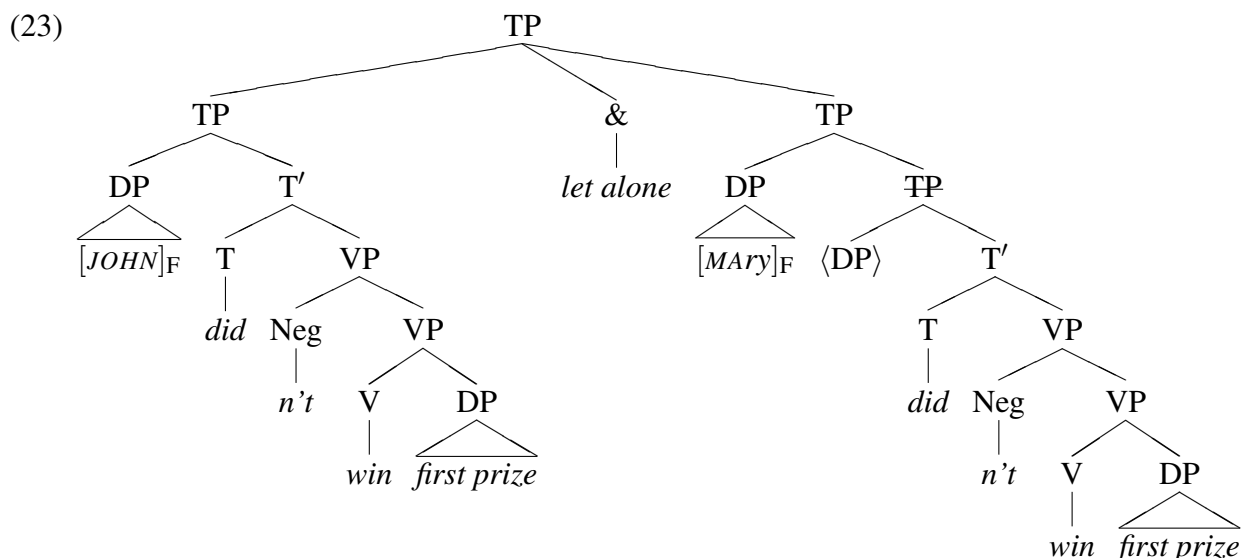
- (i) * [GORbachev]_F wouldn't denounce [COMmunism]_F as the basis of the international economy, let alone [REAGan]_F wouldn't denounce [CAPitalism]_F as the basis of the international economy.

The distributions of *let alone* and adversative *but*, which until now have been essentially identical, differ in one significant way. With adversative *but*, the remnant cannot, as we saw in Chapter 3, be the matrix subject (21). The parallel sentence with *let alone* in (22) is grammatical, though.

(21) * [JOHN]_F didn't win first prize, but [MARY]_F. (McCawley 1991:192)

(22) [JOHN]_F didn't win first prize, let alone [MARY]_F.

(21) is infelicitous because of the presence of negation in the first coordinate. The phrase that goes missing is not identical to the antecedent phrase in the first coordinate. With the *let alone* sentence in (22), however, negation is present in both coordinates:



The constituent that goes missing in (22) IS thus identical to its antecedent.

4.2 The semantics of *let alone*

Sentences with *let alone* usually seem to convey a pair of propositions, one of which corresponds, in some loose sense, to the correlate and the other to the remnant. The one in (24), for instance, repeated from (1), is true just in case Oswald both has not climbed the Berkeley hills and he has not climbed Mt. Everest.

(24) Oswald hasn't climbed the Berkeley hills, let alone Mt. Everest.

From these truth conditions, it is tempting to conclude that *let alone* expresses conjunction. Under this view, the at-issue entailment of (24) is the conjunction in (25).⁷

(ii) *I doubt [an A student]_F could teach [ARITHMETIC]_F for a year [to THIRD graders]_F at this school, let alone [a C student]_F could teach [CALCULUS]_F for a year [to ELEVENTH graders]_F at this school.

This seems to be an idiosyncratic property of English. Repp (2005:263) reports that the correlates of *let alone* in Dutch and German, *laat staan* and *geschweige denn*, allow their second coordinates to be either a subclausal constituent or, if *dat* or *dass* 'that' is added, a full clausal constituent.

⁷If *let alone* sentences have the abstract form $\neg\phi \wedge \neg\psi$, then they are equivalent by de Morgan's law to $\neg(\phi \vee \psi)$. Because of this equivalence, Hulsey (2008:35–40) argues that *let alone* actually conveys disjunctions. But when we

(25) $\lambda w(\neg\text{climb}_w(\text{the-berkeley-hills})(\text{oswald}) \wedge \neg\text{climb}_w(\text{mt-everest})(\text{oswald}))$

Of course, *let alone* does not always coordinate full clauses. In the basic form, it always combines coordinates that are smaller than a clause. *Let alone* would thus correspond to the same type of crosscategorical conjunction that I identified in Chapter 3 for the meaning of adversative *but*. Like adversative *but*, *let alone* would have the property of conjoining two propositions identical in everything but the identity of the two coordinates. We can see this for the proposed meaning in (25), where both conjuncts are of the form ‘Oswald hasn’t climbed *x*’.

Let alone is not simply crosscategorical conjunction, I contend, because not all *let alone* sentences convey two propositions of the same form. When a *let alone* sentence contains the adverb *barely*, it has, as Fillmore et al. recognize (p. 528f.), an unexpected meaning:

(26) Maria barely reached [DENVER]_F let alone [chiCAgo]_F. (Fillmore et al. 1988:529)

If *let alone* corresponded to the meet operator, the sentence in (26) should be equivalent to *Maria barely reached Denver and Maria barely reached Chicago*. This does not capture the actual meaning. If she had such a hard time getting to Denver, how did she end up making it to Chicago, too? This sentence is more accurately understood to convey that Mary barely reached Denver and that, consequently, she did not reach Chicago AT ALL. What sentences with *barely* show us, I argue, is that the at-issue entailment of a sentence like (26) is nothing more than a single atomic proposition, that Maria barely reached Denver. The intuition that it also conveys that Maria did not reach Chicago arises because *let alone* presupposes an informational asymmetry between its two ‘conjuncts.’

4.3 An informational asymmetry

Fillmore et al. observe (pp. 524–528) that, in a sentence like (27), the first conjunct, that Oswald has not climbed the Berkeley hills, is more informative than the second conjunct, that Oswald has

look at negative elements that do not obey the relevant parts of De Morgan’s laws, then it becomes clear that *let alone* cannot be equivalent to *or*.

Only for functions that are monotone decreasing— but not also antiadditive or antimorphic, in the sense of Zwarts (1998)— is narrow-scope disjunction NOT equivalent to wide-scope conjunction (see §4.6.1 below). These include generalized quantifiers built on *at most n*, where *n* is a numeral. The sentence in (i) with disjunction taking narrow scope under *at most three children* entails the sentence in (ii) where conjunction takes wide scope, but not vice versa.

- (i) At most three children have climbed the Berkeley hills or Mt. Everest. \Rightarrow
- (ii) At most three children have climbed the Berkeley hills and at most three children have climbed Mt. Everest.

When we look at a *let alone* sentence in which negation has been replaced by *at most three children* we see that it can still be paraphrased with wide-scope conjunction:

- (iii) At most three children have climbed the Berkeley hills let alone Mt. Everest.

The sentence in (iii) conveys the same information as *At most three children have climbed the Berkeley hills, and at most three children have climbed Mt. Everest*, and it is true in a context where three children (Alice, Bob, and Charles, say) have climbed the Berkeley hills, but two other children (Dominique and Everett) have climbed Mt. Everest. If, in contrast, *let alone* expressed narrow-scope disjunction— if (iii) were paraphrasable as *At most three children have climbed the Berkeley hills or Mt. Everest*— then we would expect the sentence to be false. A total of more than three children would have climbed either mountain.

not climbed Mt. Everest.

- (27) Oswald hasn't climbed the Berkeley hills let alone Mt. Everest.

Given how the world usually works, if Oswald has not climbed the Berkeley hills, it seems reasonable to infer that he also has not climbed Mt. Everest. The relation between these two propositions cannot, strictly speaking, be entailment since it is easy to come up with countermodels for the inference. If Oswald is an expert mountaineer from Nepal who has never been to North America, then Oswald will not have climbed the Berkeley hills, though he may very well have ascended Mt. Everest.

Many more such cases can be found in actual language use. In (28a), it seems likely that, if Japan has to work hard to catch up with India, it will have to work hard to catch up with China, though we can easily imagine a state-of-affairs where Japan would have to surpass China first before surpassing India in volume of trade with Africa. And, in (28b), we might expect that if many of the students had not read Joyce, they also would not have read Brown's studies of *Ulysses* or *Finnegan's Wake*. Again, this is not a necessary inference, since the world could quite easily be otherwise.

- (28) a. Japanese leaders know they will have their work cut out for them if their country is to catch up with India, let alone China, in total volume of trade and investment in Africa. (periodical)
- b. Teaching at a state university in northern California in the early 1970s, and a countercultural one at that, Brown could not expect students to arrive with or to pursue the elaborate classical training he had received. Many of us had not yet read Joyce's *Ulysses*, let alone Brown's *Love's Body* (whose title, we learned later, had come to Brown in a dream) or *Closing Time*, his study of the *Wake*. (internet)

But, while *let alone* clearly allows these inferences, which are only valid in certain contexts, it is also compatible with inferences that are valid in any situation. In (29a–b), *let alone*'s two conjuncts are related by logical entailment.

- (29) a. Souvenir shops in Alice Springs' Todd Mall are loaded with luridly painted didgeridoos, even though central Australians never used didgeridoos, let alone blue ones. (periodical)
- b. I challenge Mr. Hutton to produce hard copy of how 'each leaflet made clear in one form or another, that it was not a substitute for individuals taking proper advice about their own position.' I maintain that such advice was not given in any leaflet, let alone all. (internet)

If central Australians have not used didgeridoos (an indigenous wind instrument of Australia), they also have not used blue didgeridoos. Similarly, any situation where advice is not given in one leaflet, it also is not given in all leaflets.

To capture this observation, I propose that *let alone* presupposes that its first conjunct entails its second conjunct. This means that the sentence in (27) would come along with the following presupposition:

- (30) Oswald hasn't climbed the Berkeley hills, let alone Mt. Everest.
 At-issue: $\lambda_w(\neg\text{climb}_w(\text{the-berkeley-hills})(\text{oswald}))$
 Presupposition: $\lambda_w(\neg\text{climb}_w(\text{the-berkeley-hills})(\text{oswald}) \dashrightarrow$
 $\neg\text{climb}_w(\text{mt-everest})(\text{oswald}))$

In this case, as in many of the previous ones, this inferential relationship between the two conjuncts is not logical entailment, but something like contextual entailment. I use a broken arrow (\dashrightarrow) to remind us of that. There are states-of-affairs where Oswald has climbed Mt. Everest but he has not climbed the Berkeley hills. Nonetheless, in most normal circumstances, this seems to be a perfectly reasonable inference to make—given our knowledge about the world, that the Berkeley hills are much shorter (only 1,905 feet high), and hence easier to climb, than Mt. Everest (29,028 feet). These looser, more informal, inferences come about through domain restriction. Discourse participants share world knowledge about mountains and their relative degree of height and climbing difficulty. While, in general, there may be states-of-affairs in which Oswald has climbed Mt. Everest without having climbed the Berkeley hills, when this shared background knowledge is part of the common ground, they will not be in the context set. The presupposition of (27) will thus be satisfied. If it is not, discourse participants have the option of accommodating the presupposition and adding it to the common ground.⁸

This scalar component of *let alone*'s meaning is clearly an entailment of some sort. It cannot be canceled without leading to a contradiction:

- (31) Isabelle doesn't eat cuttlefish let alone squid. #In fact, she can eat squid without eating cuttlefish.

But it is clearly not an at-issue entailment. It has a secondary status relative to the at-issue entailment, and it cannot be contested like other at-issue entailments with *That's not true...* (Karttunen and Peters 1979:12):

- (32) A: Isabelle doesn't eat squid let alone cuttlefish.
 B1: That's not true, she eats squid.
 B2: #That's not true, she can eat cuttlefish without eating squid.
 B3: That's true, but couldn't she eat cuttlefish without eating squid?

The proposition that Isabelle does not eat squid is easily challenged, as in B's first answer. But with the scalar component, this is not possible, as shown by the infelicity of B's second answer. Instead, as in the third answer, B must first acknowledge the at-issue entailment, before going on to contest whether not eating squid entails not eating cuttlefish. I conclude that the scalar component is, in fact, a presupposition, though it is one that does not behave like prototypical presuppositions.⁹

⁸To capture the relationship between the two conjuncts, Fillmore et al. introduce (pp. 534–537) the notion of a SCALAR MODEL—a set of propositions ordered by a primitive relation of informativeness (see also Kay 1990). *Let alone* is then constrained so that its first conjunct must be more informative in this scalar model than its second conjunct. This is similar to my approach in that *let alone* makes reference to the relative informativeness of its two conjuncts in a presupposition. But they derive this propositional ordering from scales relating the subparts of a *let alone* sentence.

⁹In this respect, it seems to behave like the existential presupposition of *too* or *also*, *pace* Roberts (2006:31):

- (i) A: Isabelle, too, eats squid.

While it is certainly backgrounded, the truth or falsity of the at-issue entailment does not depend on the truth of the presupposition:

- (33) A: Isabelle doesn't eat squid let alone cuttlefish.
 B: Well, I accept that she doesn't eat squid, but can't she eat cuttlefish without eating squid?

B accepts the truth of the at-issue entailment but disputes at the same time whether not eating cuttlefish entails not eating squid. In this respect, the scalar component behaves just like the prejacent of *only*. It is an entailment that is not at-issue, and yet it is not taken for granted as the typical presupposition is.¹⁰ I will nonetheless treat the scalar component of *let alone*'s meaning as a presupposition, in the hopes that future research will discover how its behavior relates to that of more canonical presuppositions.

4.4 Deriving the 'second conjunct'

It should be clear now why only the first conjunct of the sentence in (27) is encoded as an at-issue entailment:

- (34) Oswald hasn't climbed the Berkeley hills, let alone Mt. Everest.
 At-issue entailment: $\lambda_w(\neg\text{climb}_w(\text{the-berkeley-hills})(\text{oswald}))$
 Presupposition: $\lambda_w(\neg\text{climb}_w(\text{the-berkeley-hills})(\text{oswald}) \dashrightarrow \neg\text{climb}_w(\text{mt-everest})(\text{oswald}))$

Once the common ground satisfies the presupposition in (34), adding the at-issue entailment results in the common ground also entailing that Oswald has not climbed Mt. Everest. The 'second conjunct,' in other words, is a contextual entailment that arises from adding the at-issue entailment to a common ground satisfying the presupposition.

The contextual entailment of the *let alone* sentence in (34) behaves just like an at-issue entailment. It is contradictory to add *In fact, he has climbed Mt. Everest*, as in (35). A third party, if they wanted to contest the contextual entailment, could do so, as in (36), with *That's not true...*

-
- B: Well, I accept that Isabelle eats squid, but is there really somebody else who does?

I have not been exploring the parallels between the additives and scalar additives in detail, but this similarity is suggestive.

¹⁰In addition, while canonical presuppositions survive embedding under epistemic possibility modals, under negation, and in questions, it is not clear that the scalar component does:

- (i) It might be that Isabelle doesn't eat cuttlefish let alone squid.
- (ii) It isn't that Isabelle doesn't eat cuttlefish let alone squid.
- (iii) Who eats cuttlefish let alone squid?

The judgments here are exceptionally slippery, partly because these sentences are so awkward to begin with. We need, first, to exclude readings of these sentences in which *let alone* takes scope over the presupposition hole. There is an interpretation of (i), for instance, where the propositions being related by entailment are *It might be that Isabelle doesn't eat cuttlefish* and *It might be that Isabelle doesn't eat squid*. Excluding this case, then, whenever (i) is true, is it also true that if Isabelle does not eat cuttlefish she does not eat squid? A clear answer one way or another does not present itself to me.

- (35) Oswald hasn't climbed the Berkeley hills let alone Mt. Everest. #In fact, he has climbed Mt. Everest.
- (36) A: Oswald hasn't climbed the Berkeley hills let alone Mt. Everest.
B: That's not true, he has climbed Mt. Everest.

The contextual entailment is just as much 'at-issue' as the proposition actually described by the *let alone* sentence. Both must address the same question under discussion. Take, for instance, the following:

- (37) You'd have thought your Brian could have found you somewhere a bit more comfortable, interposed Mrs. Harper, seeing her opportunity of introducing Brian to his disadvantage, 'he must know a few folk, it's not only money that counts...' and her voice trailed away, as she simultaneously managed to imply that Brian had the Town Hall in the palm of his hand, and that he had enough money to buy his father a comfortable bungalow in a nice suburb whenever he felt like it. Shirley watched Fred return Mrs. Harper's grease-smearred, red-nosed gaze: affable, broad, patient, he stared at her, and wiped his mouth on his table napkin. She could see his decision not to bother to try to explain that Brian hardly knew anybody in Northam Town Hall, and that **Brian's salary as Head of Humanities at an Adult Education College hardly rose to paying his own mortgage, let alone to buying a house for his aging father.**
- (38) Several commentators have claimed that on this expedition Gould's party was the first ever to reach the great western bend of the Murray overland from Adelaide. But we cannot be certain that Gould even got as far as the river at all. He himself says he 'spent five weeks entirely in the bush in the interior, partly on the ranges and partly on the belts of the Murray.' Although he had a magnificent view from the top of the Mount Lofty range of the Murray River, winding its course across the flats through a belt of dense dwarf eucalypti, **there is no mention of his ever having reached its banks, let alone the remote western bend 100 miles away.**

In (37), the narrator is discussing whether Brian has the money to buy a house for his aging father, addressing the question under discussion *What does Brian's salary rise to?* This is a question that is answered both by the at-issue entailment of the *let alone* sentence—that it does not rise to paying for Brian's own mortgage—as well as the contextual entailment that his salary is not enough to buy the father a house. In (38), the question under discussion corresponds to *What did Gould reach?*, a question answered both by the at-issue entailment that he did not reach the western bend of the Murray River and the contextual entailment that he did not reach its shores.

Since *let alone* presupposes that its two conjuncts are related by entailment, it would be redundant to encode the second conjunct as part of its at-issue meaning. Moreover, as we will see next, doing so would give the wrong meaning for sentences containing *barely*. The second conjunct cannot be derived compositionally from the material that is overtly present. It must arise through an inference of the type described above.

4.5 Barely a problem

Imagine that Maria is driving from San Francisco to Chicago to attend her brother's wedding. A blizzard strikes as she nears Denver. Since she brought along chains, she manages to make it to a hotel downtown, though she is stuck there for a week until the storm clears. She has missed the wedding, so she turns around and goes home. In such a situation, if somebody asked me whether Maria made it to her brother's wedding, I could truthfully say:

(39) Maria barely reached Denver let alone Chicago.

If *let alone's* at-issue content consisted of two conjoined propositions, they would have to be identical in everything but the remnant and correlate. But this is not the case with (39). This sentence is best paraphrased as saying that Mary barely reached Denver, and that she did NOT reach Chicago. This same, unexpected, interpretation presents itself in naturally occurring examples:¹¹

- (40) a. The West African temperature would be rising during the European spring; the longer I took, the worse it would be at the end. We had barely enough food for three months, let alone the four and a half it would take at fifteen miles a day. Nor would the £1,500 I had borrowed last that long. (corpus)
- b. At that time she was a keen runner, often winning medals at school for her athletic prowess. Shortly after the drift, her father Kees Bon started noticing changes in her character. 'She had stomach aches, muscle weakness, headaches,' he said. 'Suddenly she didn't want to do anything. She could barely run 100 yards, let alone 10 km.' (internet)

The author of (40a) says that they barely had enough food for three months but that they did not have enough for four and a half months. They would also run out of money if they took that long. The author of (40b) similarly asserts that his daughter did not want to do anything she normally did. She might be able to run 100 yards but not the ten kilometers she used to.

To see why these sentences mean what they do, we need a better understanding of the semantics of *barely*. It is standardly analyzed as having two distinct meaning components. For the sentence in (41), the at-issue entailment corresponds, roughly speaking, to the proposition that Maria came close to not reaching Denver:

- (41) Maria barely reached Denver.
At-issue entailment: Maria came close to not reaching Denver.
Prejacent: Maria reached Denver.

¹¹*Hardly* and *scarcely*, whose semantics approximate those of *barely*, exhibit the same interaction with *let alone*:

- (i) The United States fleet, however, was unbalanced, for Congress had ignored the persistent requests of the General Board, passed on to them by the Secretary of the Navy, for adequate personnel to man the ships and for the necessary auxiliary ships, cruisers, destroyers, transports, ammunition ships and above all colliers on which the movement of the fleet depended. In 1914 the battleship fleet could hardly reach San Francisco, let alone make a voyage of 10,000 miles from their Atlantic base to the Philippines. (periodical)
- (ii) Criminologists have scarcely addressed, let alone answered, the broad questions of explaining overall trends in crime. (corpus)

If, in (i), the fleet came close to not reaching San Francisco, then they did not make it to the Philippines. And, in (ii), if criminologists have come close to not addressing the question of overall trends, they have not answered them.

The second meaning component, the prejacent, is derived by taking everything in the sentence except *barely* and combining it in the normal way. While there is a relatively clear consensus that the prejacent has a backgrounded status relative to the at-issue entailment, it has not always been treated as an entailment. Sadock (1981), for instance, treats it as a generalized conversational implicature, a line taken up again more recently by Ziegeler (2000). If I utter a sentence *barely* ϕ , this entails that it is almost the case that ϕ was false. Since I am obeying the maxim of quantity, if I had wanted to assert that ϕ is false, I would have said *not* ϕ . I did not say *not* ϕ , therefore *not* ϕ must be false (or, conversely, that ϕ is true).¹² Sadock notes (p. 265), however, that, unlike other conversational implicatures, the prejacent is not readily canceled:¹³

(42) The tulip is barely black. #In fact, it isn't black.

Attempting to cancel the prejacent leads simply to contradiction, so that it seems more appropriately treated as an entailment.

The at-issue entailment, in (41), is counterfactual in nature. Though Maria reaches Denver, circumstances are such that she could very well have NOT gotten there. What circumstances are these? In this scenario, the only reason Maria makes it to Denver is that she had the foresight to bring chains with her. But this counterfactual interpretation, in fact, is just one of three available for this sentence, though these other two are dispreferred in the context given. The first, purely scalar interpretation comes out in a context where we are standing at the Denver city limit waiting for Maria to arrive. She drives up and stops with her rear fender just past the limit. The use of (41) in this context highlights the degree to which Maria has arrived in Denver. The second involves a temporal understanding. Say Maria is running across the United States. Just as she enters Denver, she tears a tendon. I could say *Maria barely reached Denver when she tore a tendon*, meaning that she tore a tendon not long after entering Denver.

Sevi (1998) gives a semantics for *barely* that allows for all three of these interpretations. Its at-issue entailment can be given as follows:¹⁴

(43) $\llbracket \text{barely } \phi \rrbracket = \lambda i (\exists i' (i' \neq i \wedge \forall i'' (i'' \neq i \rightarrow i' \leq_i i'') \wedge \neg \llbracket \phi \rrbracket (i')))$

¹²Sadock actually only treats *almost*. His account extends straightforwardly to *barely*, though, since it is equivalent to the inner negation of *almost*.

¹³Sadock suggests (p. 265f.) that, as an implicature, the prejacent can be reinforced without producing redundancy, as in (i).

- (i) Bill barely swam the English Channel, but he did it.
- (ii) Bill swam the English Channel very slowly, but he did it. (Sevi 1998:27)

Sevi observes (p. 27) that this is not just a property of conversational implicatures. Entailments, such as the one in (ii), too, can be reinforced without being redundant.

¹⁴Sevi actually defines (p. 65) *barely* as in (i). With this meaning, however, *barely* sentences would always be false, since the universally quantified statement in the restriction of the existential quantifier is a contradiction.

- (i) $\llbracket \text{barely } \phi \rrbracket = \lambda i \exists i' (\forall i'' (i' <_i i'') \wedge \neg \llbracket \phi \rrbracket (i'))$

If the set of indices is strictly ordered, as Sevi explicitly says they are, then there is no model in which an index i' is closer to i than every index since this would include i' itself. The lexical entry in (43) is meant to translate his informal paraphrase: *barely* A 'is true in i^* iff A is true in i^* and there is a minimally close i s.t. A is false in i ' (p. 66).

Given some index relative to which the sentence is evaluated, *barely* says that the closest discrete index to the index of evaluation is false (for i, i' , and i'' in I , $i' <_i i''$ is read ‘ i' is as close or closer to i than i'' ’). This meaning is crucially underspecified: the set containing i, i' , and i'' can be a linearly ordered set containing possible worlds, standards of precision, or time intervals. Since this set is specified by the context it allows us to understand how a single sentence—(41), for instance—can have such different interpretations.¹⁵ Restricting our attention just to the counterfactual understanding of (41), its two meaning components can be translated as follows:

- (44) Maria barely reached Denver.
 At-issue entailment:
 $\lambda w \exists w' (w' \neq w \wedge \forall w'' (w'' \neq w \rightarrow w' \leq_w w'')) \wedge \neg \text{reach}_{w'}(\text{denver})(\text{maria}))$
 Prejacent: **reach(denver)(maria)**

The indices manipulated by *barely* are possible worlds, and the contextually salient set of worlds it quantifies over are those in which Maria does not bring chains along. The at-issue entailment is true, then, just in case, in the closest world to the world of evaluation in which Maria does not bring chains along, Maria does not make it to Denver.

We can now account for the *let alone* sentence in (39). It has three meaning components: the at-issue entailment and the prejacent of *barely*, as well as the scalar presupposition of *let alone*:

- (45) Maria barely reached Denver let alone Chicago.
 At-issue entailment:
 $\lambda w \exists w' (w' \neq w \wedge \forall w'' (w'' \neq w \rightarrow w' \leq_w w'')) \wedge \neg \text{reach}_{w'}(\text{denver})(\text{maria}))$
 Prejacent: **reach(denver)(maria)**
 Presupposition:
 $\lambda w \exists w' (w' \neq w \wedge \forall w'' (w'' \neq w \rightarrow w' \leq_w w'')) \wedge \neg \text{reach}_{w'}(\text{denver})(\text{maria})) \dashv\vdash$
 $\exists w' (w' \neq w \wedge \forall w'' (w'' \neq w \rightarrow w' \leq_w w'')) \wedge \neg \text{reach}_{w'}(\text{chicago})(\text{maria}))$

Under the current analysis, the sentence in (45) only entails that Maria reached Denver, though she was close to not doing so. It presupposes, in addition, that Maria’s barely reaching Denver entails her barely reaching Chicago—more precisely, if there is a world maximally similar to the world of evaluation in which Maria did not bring chains and she did not make it to Denver, then there is also a world maximally similar to the world of evaluation in which Maria did not bring chains and she did not make it to Chicago. This presupposition is satisfied in the given context: in the closest world where Maria does not have chains and does not make it Denver, she also does not get to Chicago, since Maria would have to first go through Denver.¹⁶

¹⁵In contrast, Sadock only tries to account for the counterfactual understanding. He gives a modal analysis to *almost*’s at-issue component (p. 259), which extended to *barely*, would paraphrase the sentence *barely* ϕ as: there is a possible world in which ϕ is false that is not very different from the world of evaluation. Hitzeman (1992), on the other hand, treats *almost* as a function from scales onto other scales. This accounts solely for the understanding of *barely* where it makes reference to standards of precision.

¹⁶*Let alone* only relates the at-issue entailment of *barely* by entailment. (45) clearly does not presuppose that if Maria reached Denver, she reached Chicago. Roberts (2006) places the prejacent of *barely* into the same category of presupposition as the prejacent of *only*. And, in fact, both interact with *let alone* in the same way. When *only* occurs in a *let alone* sentence, its prejacent is not included in the scalar presupposition:

- (i) Only John eats fish, let alone squid.

Where, then, does our intuition come from that (39) conveys that Maria did not get to Chicago? The prejacent tells us that she did make it to Denver, though she would not have if, as the at-issue entailment says, she had not brought along chains. Given the distance between Denver and Chicago (1,001 miles) and the reduced speed you have to go with chains on, there is no way she could have made it to Chicago. The second conjunct in this *barely* sentence is, as in other *let alone* sentences, a contextual entailment resulting from updating the common ground with the at-issue entailment and prejacent. Like all entailments, it cannot be canceled:

- (46) A: I heard about the blizzard. Did Maria make it to Chicago?
B: Maria barely reached Denver let alone Chicago. #In fact, she made it to Chicago, too.

This just yields a contradiction. The inference is not unique to *let alone*. A regular *barely* sentence produces the same inference in the right contexts. The *barely* sentence in (47) answers, albeit indirectly, the question of whether Mary reached Chicago in the negative.¹⁷

- (47) Q: Did Mary make it to Chicago?
A: Maria barely reached Denver.

Granted, whether this contextual entailment arises or not is highly dependent on contextual and world knowledge. To infer that Maria did not make it to Chicago we need to know that she is driving east toward Chicago; and, we need to know what it is like to drive in adverse weather conditions. We expect, accordingly, that this inference should only arise when the relevant contextual conditions hold. When, for instance, the distance between the correlate and remnant is reduced to something much smaller than the distance between Denver and Chicago, our world knowledge about how to drive with chains does not ensure that the inference goes through:

- (48) A: I heard about the blizzard. Did Mary make it to Brighton?
B: ?Maria barely reached Denver let alone Brighton.

Just because it was hard for Maria to get to Denver does not mean that she was unable to make it to Brighton, Colorado, located 21 miles outside of Denver. It is quite possible to go this distance with chains, even at the slower speed they require. While the prejacent of the second conjunct is not entailed, the context may nonetheless be compatible with it. Consider, for instance, the examples in (49) where *barely* has its scalar interpretation.

- (49) a. I appeared on ‘Wolfman Mac’s Chiller Drive-In’ on TV20 recently. I was amazed and humbled by the compliments I received. I can barely remember names let alone script lines. Then to put it together with expressions and interaction with other characters was challenging. (internet)
b. I saw his band in May 2005, he performed when he really sick, he barely could speak let alone sing, and he had to go to the hospital straight afterwards. He apologized for not being able to sing his best and offered anyone in the venue a refund. From what I could tell, no one got one. A true warrior. (internet)

All this sentence presupposes is that, if there is one person who eats fish, there will only be one person who eats squid. But the fact that someone eats fish does not tell us anything about whether someone eats squid.

¹⁷As with other contextual entailments, this one, too, cannot be canceled. It would be contradictory to follow up the answer in (47) with *In fact, she didn’t reach Chicago!*

The *let alone* sentence in (49a) conveys that the author can barely remember the names of characters and, indirectly, that she can also only barely remember lines. We know that she does, in fact, remember the lines since she finds it even more difficult to act the lines. Similarly, in (49b), the singer could barely speak, and he could barely sing — though, he could sing since he later apologized for not singing his best.

The two ‘conjuncts’ of a *let alone* sentence are both entailed — and hence neither can be canceled. But only the first conjunct is actually described as part of its at-issue entailment. Sentences with *barely* show us that the second conjunct arises as a contextual entailment of the first conjunct, once the common ground satisfies *let alone*’s presupposition.

4.6 Letting negative polarity alone

There has, conspicuously perhaps, always been a negative element present in all the *let alone* sentences we have looked at so far. For Fillmore et al., this is unsurprising since they consider *let alone* to be a negative polarity item (p. 518f.) By most obvious diagnostics, this seems right. Removing negation from the sentence in (34) results in infelicity:

(50) #Oswald has climbed the Berkeley hills let alone Mt. Everest.

If *let alone* is a negative polarity item, it is an unusual one. Negative polarity items usually must occur in the scope of an appropriate licenser — whether this is a monotone decreasing function (Ladusaw 1980a,b) or a nonveridical expression (Zwarts 1995, Giannakidou 1998, 1999). But *let alone* does not seem to care where its licenser occurs. *Let alone* can appear within the scope of negation, as in (51), but it is also possible for the negative element to show up inside the sister of *let alone*, as in (52a–b).

(51) Other couples wandered in their wake, or else lingered on the hilltop by the Commemorative stone, happier in their partners. For, of course, you could **not** see to [DP the foot of the hill], let alone [DP seven counties], under the stars. (corpus)

(52) a. And he remains his country’s most polarizing figure — loved by those who admire his can-do spirit, loathed by those who see him as a crass salesman flaunting his disregard for the very laws he was elected to uphold. His critics believe that [DP **no** politician], let alone [DP a head of government], should be so heavily invested in sectors tightly regulated by the state. (periodical)

b. The education these women were required to have, however, was not the academic education available to men, but moral education: ‘the girls at Highgate. . . were perceived to have the moral immaturity of children, unable to curb their appetite or temper’ (Marsh 243). In ‘Goblin Market,’ Laura and Lizzie have both been morally educated [TP to **not** even ‘peep at goblin men’ (49)], let alone [TP to enter into an economy of exchange with them]. (internet)

Let alone has this loose relationship with negative elements, I argue, because it is not a negative polarity item, at least not in the traditional sense. Rather, the semantics of *let alone* contrive with general pragmatic principles to restrict its distribution.

4.6.1 Downward entailing environments

Let alone does not just occur with negation. It occurs in any DOWNWARD ENTAILING environment—any position in the sentence that allows for the substitution of a subset-denoting expression for a superset-denoting expression while preserving truth.¹⁸ The scope of negation is a downward entailment environment, as illustrated in (53), but so are the scopes of a variety of other expressions.

- (53) Like any self-respecting academics, the Brookings authors do **not** agree on what the problem is, **let alone** how to cure it. (corpus)

Following Zwarts (1998), we can fit downward entailing expressions into a hierarchy based on how well they obey De Morgan's laws. MONOTONE DECREASING functions are those that obey half of the first law and half of the second law (54).¹⁹ Functions that are ANTIADDITIVE obey all of the first law and half of the second law (55). Functions that are ANTIMORPHIC obey all four parts of De Morgan's laws (56). All antimorphic expressions are consequently also antiadditive, and all antiadditive expressions are also monotone decreasing.

- (54) A function F is MONOTONE DECREASING iff, for arbitrary X and Y ,
- i. $F(X \cup Y) \subseteq F(X) \cap F(Y)$;
 - ii. $F(X) \cup F(Y) \subseteq F(X \cap Y)$.

- (55) A function F is ANTIADDITIVE iff, for arbitrary X and Y ,
- i. $F(X \cup Y) = F(X) \cap F(Y)$;
 - ii. $F(X) \cup F(Y) \subseteq F(X \cap Y)$.

- (56) A function F is ANTIMORPHIC iff, for arbitrary X and Y ,
- i. $F(X \cup Y) = F(X) \cap F(Y)$;
 - ii. $F(X) \cup F(Y) = F(X \cap Y)$.

While negation is antimorphic—and hence obeys both of the De Morgan equivalences—most other negative expressions are located lower on the hierarchy. *Let alone* shows up in the scope of a variety of antiadditive functions, including the negative adverb *never* (57), the negative adjective *difficult* (58), the negative quantifier *no one* (59), the quantificational determiner *every* (60), *without* (61), the degree modifier *too* (62), and the preposition *before* (63).²⁰

- (57) Where Musgrove and John Hopkins, who put it all together, got lucky was that they chronicled a period of success that may **never** have been equalled, **let alone** exceeded, by any British golfer. (corpus)
- (58) Indeed, the only way in which a society can come to terms with its conflicting values is to prefer one value in some circumstances and another in different conditions. It is **difficult** enough for an individual to be consistent, **let alone** a society. (corpus)

¹⁸More precisely, an expression α contained in a sentence ϕ is in a DOWNWARD ENTAILING ENVIRONMENT iff, for any β such that $\llbracket \beta \rrbracket \subseteq \llbracket \alpha \rrbracket$, ϕ entails $\phi[\alpha/\beta]$ (replacing α with β in ϕ).

¹⁹(54) is equivalent to the more usual formulation of a monotone decreasing function as a function F that, for arbitrary X and Y , if $X \subseteq Y$, then $F(Y) \subseteq F(X)$.

²⁰Sánchez Valencia et al. (1993) prove that with Landman's (1991:140–145) semantics *before* is antiadditive.

- (59) **No one** had even heard of Pat Weaver, **let alone** seen him. (corpus)
- (60) What irks the Brits, and irks far more their Unionist fellow-citizens in Northern Ireland, is that foreigners—in pursuit of domestic votes, not Irish welfare—are using economic pressure to tell them how to behave. **Every** American ‘fact-finding’ visit to Ulster, **let alone** those of overt IRA propagandists, rubs salt into this irritation. (corpus)
- (61) I have now lived in the same place through nine general elections **without** once seeing, **let alone** being accosted by, a parliamentary candidate. (corpus)
- (62) Diana was sympathetic, but did not fully understand his unrest, nor his frantic soul-searching. She was twenty-three and simply **too** young to comprehend the feelings of middle age—**let alone** those of a middle-aged Prince. (corpus)
- (63) Little attention was paid to it, and 10 years passed **before** the existence, **let alone** the exact functions of these receptors, non-committally named alpha and beta, was recognized. (corpus)

Since these expressions are the only monotone decreasing functions in the sentence, they create the downward entailing environment in which *let alone* occurs. (If there were two such functions, they would create, by the Law of Double Negation, an upward entailing context.) *Let alone* can also appear in the scope of quantifiers like *few Asian adults* (64) and *at most ten people* (65), which are simply monotone decreasing (they are not antiadditive).

- (64) In Southall now, particularly since the murder in summer 1976 of a young man, Gurdeep Singh Chaggar, by racist thugs, **few Asian adults** even think about integration, **let alone** want it. (corpus)
- (65) By 1928, **at most ten people** had ever swum the Channel, **let alone** the Atlantic.

There are a number of other contexts where *let alone* appears that are not straightforwardly downward entailing, e.g. in the scope of *barely* (66) or *only* (67), in the antecedent of conditionals (68), in the complement of adversative predicates like *be surprised* (69) or factive attitude verbs like *be sorry* (70), and inside of superlatives (71).

- (66) And to think, he wrote, that with all my previous work I **barely** knew what step to take first, **let alone** what step to take second, let us not talk about the third. (corpus)
- (67) Although Indians had been allowed to join the ICS since 1858, **only** a handful had actually sat its fiercely competitive examinations, **let alone** passed. (corpus)
- (68) Mrs. Clinton once had a big lead among the party elders, but has been steadily losing it, in large part because of her negative campaign. **If** she is ever to have a hope of persuading these most loyal of Democrats to come back to her side, **let alone** win over the larger body of voters, she has to call off the dogs. (periodical)
- (69) However, I’m **surprised** that Apple would even announce, **let alone** bring online, a new system until it was as capable and bug-free as the old. (internet)
- (70) Dixon told investigators he believed the wolf he trapped with the ATV had been wounded during an earlier incident. That animal was the Wedge pack’s alpha female. ‘I **am very sorry** that this event happened, on any ranch, **let alone** our own,’ Lang said in a written statement. (periodical)

- (71) The big show: Bizarre as it still seems to me, this might be **the biggest show** of the year, **let alone** the weekend. (internet)

To illustrate, take a sentence like *I barely know a linguist*: substituting a subset-denoting expression for the superset-denoting one, as in *I barely know a Danish linguist*, does not preserve truth. The one linguist I know might be Norwegian. What we need to do, as Horn (2002) does, is factor out the prejacent. If, in the closest world to the world of evaluation, I do not know a linguist, then in that same world I do not know a Danish linguist. A similar proposal is made by von Stechow (1999) for *only* and the other environments in (66–71) that license *let alone*. He defines a notion of Strawson-downward-entailingness in which inferences from supersets to subsets are valid modulo the satisfaction of any presuppositions.²¹

4.6.2 Flipping scales

Recall from §§4.2–4.5 that *let alone* describes its first conjunct and presupposes that the first conjunct entails the second conjunct. With these semantics, *let alone* does not automatically occur just in downward entailing environments. As long as *let alone*'s presupposition is satisfied, it should be felicitous. There are, in fact, many naturally occurring examples in nondownward entailing contexts:

- (72) I'll try to find it and post it but there is a lot of research that shows poverty and wealth are relative, not absolute concepts. The rich 100 years ago also had all they needed, or so they thought. Yet most **poor people today, let alone rich ones**, have much more than the wealthy had in the past. (internet)
- (73) Bosnia saw an influx of Arab and other Muslim mujahideen during the war; they arrived at the invitation of the Izetbegović government, and saw Bosnia as one more front in a war with hotspots as disparate as Chechnya, Afghanistan, and Kashmir. Most **Bosnian Muslims—let alone Croats and Serbs**—found their doctrines alien and their sectarian militancy disturbing. (internet)

In both of these examples, the correlate and remnant occur in the first argument of *most*, a quantificational determiner that is nonmonotonic on both its arguments. To see this for the first argument, we need to see whether *Most linguists are syntacticians* entails *Most Danish linguists are syntacticians*. It does not, since Danish linguists could all be phonologists. Nor does *Most Danish linguists are syntacticians* entail *Most linguists are syntacticians*. Only a fraction of linguistics are Danes. Nonetheless, *let alone* seems perfectly comfortable in the first argument of *most*. In fact, it does

²¹ Similarly hard to characterize as downward entailing are polar questions and wh-questions, though *let alone* seems perfectly happy appearing in both (the presence of *even* in (i) is not relevant here):

- (i) If the caller's funny and amusing does it really matter whether they're geniune or not? Does the average listener even notice, **let alone** care? (internet)
- (ii) **How many** modern Prime Ministers could recall such exploits in their past, **let alone** dare to boast about them? In a liberal democracy 'nonviolence' is a cherished value, perhaps the most cherished of all values, for violence is perceived as the negation of democracy. (corpus)

I leave the treatment of *let alone* in questions to future research.

not seem as if the monotonicity properties of the quantificational determiner matter very much. In (72), *most* can be replaced quite felicitously by either *some*, which is monotone increasing on its first argument, or *all*, which is monotone decreasing on its first argument:

- (72') Some poor people today, let alone rich ones, have more than the wealthy had in the past.
 (72'') All poor people today, let alone rich ones, have more than the wealthy had in the past.

To understand *let alone*'s indiscriminate behavior in these examples, we first need to understand how scales behave in downward entailing environments.

Downward entailing environments reverse the direction of entailment. Inferences, instead of running from subsets to supersets, run from supersets to subsets. They therefore affect inferences based on Horn scales — scales ordered by the subset relation — such as $\langle \textit{boiling, hot, warm, \dots} \rangle$. By convention, stronger members are listed to the left while weaker members are listed to the right. An upward entailing sentence, such as (74a), containing a stronger member of this scale entails the parallel sentence containing a weaker member. Adding wide-scope negation, as in (74b), creates a downward entailing environment where the direction of entailment flips.

- (74) a. The soup is hot. \Rightarrow The soup is warm.
 b. The soup isn't hot. \Leftarrow The soup isn't warm.

While Horn scales hold in any model, some scales based on the subset relation are specific to a certain state-of-affairs. Imagine a (very conservative) society in which men must first become husbands before becoming fathers. The scale $\langle \textit{father, husband, \dots} \rangle$ would then be valid since every father in this situation is also a husband. Such pragmatic scales license inferences just like Horn scales, as Ducrot (1973:239) and Fauconnier (1975:362) observe:

- (75) a. He is a father. \Rightarrow He is a husband.
 b. He isn't a father. \Leftarrow He isn't a husband.

A sentence containing a stronger member of the scale, *father*, entails the parallel sentence containing a weaker member, *husband*, except when these expressions occur in the scope of a monotone decreasing function. Then, the inference goes in the opposite direction.

There are sets of expression that not ordered by the subset relation. This is the case with RANKS, for instance, whose elements are disjoint. The typical examples are military ranks (*private, corporal, sergeant*, and so on, through *general*), types of criminal offenses (*tort, misdemeanor, felony*), and poker hands (*a pair, two pair, three of a kind*, etc., etc., with *royal flush* at the top). Consider just the military rank: while the set of generals and the set of corporals do not overlap, every general is located higher in the military hierarchy than every corporal. Because the intersection of any of the members of a rank is empty, they cannot be predicated of the same individual.²²

- (76) a. Alex is a corporal. And she is a general.

²²This is an entailment of the lexemes in question and cannot be canceled, as Horn (1972:64f.) shows:

- (i) a. #He's **not only** a corporal, he's a sergeant.
 b. #Smoking marijuana is a misdemeanor, **in fact** it's a felony. (Horn 2001:546 fn. 21)
- (ii) a. He's a corporal, **or even** a general.
 b. Smoking marijuana is a misdemeanor, **if not** a felony.

- b. Alex is not a corporal. And she is not a general.

Since Alex cannot simultaneously be both a corporal and a general, the sequence of statements in (76a), with coreference between *Alex* and *she*, is contradictory. Their negations are, however, compatible, as shown in (76b). In other words, the members of a Horn scale are constrained only so that the elements of a stronger member are also elements of a weaker member, as shown in (77a).

- (77) a. $\{\langle \alpha, \beta \rangle \mid \forall x(\llbracket \alpha \rrbracket(x) \rightarrow \llbracket \beta \rrbracket(x))\}$
 b. $\{\langle \alpha, \beta \rangle \mid \forall x \forall y(\llbracket \alpha \rrbracket(x) \wedge \llbracket \beta \rrbracket(y) \rightarrow x \text{ is higher in military rank than } y)\}$

For the military rank in (77b), in contrast, the relationship between its members are defined in terms of the military hierarchy, which, as an irreflexive relation, is a strict partial order. If every element of a stronger member must be higher on this hierarchy than every element of a weaker member, then the extensions of the expressions in a rank will necessarily be disjoint.

As one might expect, *let alone* is ruled out when, in an upward entailing context, the correlate and remnant are members of a rank and predicated of the same individual. (78) presupposes—impossibly—that, if Alex is a general, she is also a corporal.

- (78) # Alex is a general let alone a corporal.
 (79) Alex isn't a corporal let alone a general.

When, in contrast, the elements of the rank are located in the scope of negation, as in (79), *let alone* is perfectly felicitous. This is expected since it is easily possible to be neither a corporal nor a general. Neither of the *let alone* examples in (72–73) contains negation even though the correlate and remnant are ordered in a rank. In (72), the set of poor people today and the set of rich people today are disjoint sets. These sets as related by a strict partial order, the have-more-wealth relation. All rich people have more wealth than all poor people. The correlate and remnant in (73) are related in a similar way, through the ordering between the set of Bosnian Muslims and the set of Croats and Serbs only holds in certain contexts.

Given the scalar relationship between *poor people* and *rich people* in (72) and the meaning of the sentence in which they occur, we can see now that the monotonicity properties of the quantificational determiner are just not going to matter. The sentence's at-issue meaning is that most poor people today have more wealth than rich people of the past. The presupposition of *let alone*, too, is satisfied: since all rich people have more wealth than all poor people, if most poor people today have more wealth than the rich people of the past, then it follows that most rich people today have more wealth as well. This presupposition is also satisfied in (72'): if there is one poor person today who has more wealth, then there is going to be some rich person today who has more wealth (assuming, of course, that there are any rich people at all). And, in (72''), if all poor people today have more wealth, then all rich people today have more wealth.

Individuals ordered along some dimension behave like ranks. Distinct individuals in a domain exclude each other just like the members of a rank. *Let alone* can relate two such individuals in

With *not only* and *in fact* in (i), we can attempt to cancel the exclusivity entailment encoded by *corporal* and *sergeant*—though this is not possible. It is, however, possible to suspend this entailment, as shown in (ii), with *or even* and *if not*. Because these expressions require a weaker epistemic commitment by the speaker, they are can relate members of a rank.

an upward entailing environment when the sentence makes reference to the way in which they are ordered. Consider, for instance, the examples in (80–81). In both, *let alone* occurs in an upwards entailing environment: if Mary and Susan are tall, then Susan is tall; and if the galaxy and the universe are large, then the galaxy is large.

- (80) Jordan, yeah Lee had trouble getting acting parts when young because he was tall. This was at a time when **6 ft.** was tall **let alone 6'5"**. (internet)
- (81) **The galaxy** is large, **let alone the universe**, there are probably many many 'earth like' places out there. . .get over it. (internet)

The correlate and remnant in (80) are strictly ordered by tallness: 6'5" is taller than 6'. Similarly, in (81), the universe is larger than the galaxy. Thus, given the at-issue entailment of (80), that 6' is tall—that it exceeds a contextually salient standard of comparison—the presupposition of *let alone* is also satisfied, since it follows that 6'5" also exceeds the same standard.

From the preceding examples, it is clear that *let alone* is not restricted to downward entailing contexts. Granted, these examples always involved ranks—whether they hold across models (as with *poor people* and *rich people*) or in a specific context (as with *Muslim Bosnians* and *Croats and Serbs*). Does *let alone* occur in upward entailing contexts when the correlate and remnant are related by a scale ordered by the subset relation? Fillmore et al. observe (p. 519 fn. 13) that some speakers find examples like (82) felicitous.

- (82) A: He was pleased.
 B: He was **delighted, let alone pleased**. (Fillmore et al. 1988:519 fn. 13)

Given the logical relationship between *delighted* and *pleased*—a classic Horn scale—the first conjunct clearly entails the second conjunct. And, since the correlate and remnant occur here in an upward entailing environment, it is the higher member on the scale of happiness that appears on *let alone*'s left, and the lower member that occurs on its right. While (82) is constructed, such examples are not unattested in the wild:

- (83) MsTkEyes: I feel so bad for laughing.
 SpArEEE: You should feel **horrible let alone bad**. (internet)

The adjectives *horrible* and *bad* form a Horn scale, the stronger member of which is contained within the first conjunct so that it entails the second conjunct in any model. If you should feel horrible, then you should feel bad.

When the correlate and remnant denote individuals related along some dimension, they can trigger inferences whose direction depends on the monotonicity of the environment they appear in, albeit indirectly. Recall that in the mountain climbing context discussed above, the correlate and remnant of the *let alone* sentence in (34), repeated below, are strictly ordered by how high they are.

- (84) Q: What has Oswald climbed?
 A: Oswald hasn't climbed the Berkeley hills, let alone Mt. Everest.
 At-issue entailment: $\lambda_w(\neg\text{climb}_w(\text{the-berkeley-hills})(\text{oswald}))$
 Presupposition: $\lambda_w(\neg\text{climb}_w(\text{the-berkeley-hills})(\text{oswald})) \dashrightarrow \neg\text{climb}_w(\text{mt-everest})(\text{oswald})$

The highest peak of the Berkeley hills is shorter than Mt. Everest. All by itself, this ordering does not allow us to make any inferences concerning whether Oswald has climbed them. Only additional background information about the height of these mountains and their relative difficulty allows us to satisfy *let alone*'s presupposition. Only then are all the situations in which Oswald has not climbed the Berkeley hills also situations where he has not climbed Mt. Everest. If the common ground entails the necessary information to make an inference of this type, then it should not matter whether this inference involves negative propositions, as in (84), or positive ones, as in the following naturally occurring examples:

- (85) Meanwhile I help with a petition for the Rosenbergs. Impossible to get people to sign it, except party and near-party intellectuals. (Not like France. The atmosphere of this country has changed dramatically in the last two or three years, tight, suspicious, frightened. It would take very little to send it off balance into our version of McCarthyism.) I am asked, even by **people in the Party, let alone the 'respectable' intellectuals**, why do I petition on behalf of the Rosenbergs but not on behalf of the people framed in Prague? (literature)
- (86) Mr. Emanuel is adamant about the administration's success so far. 'We're about to have the most productive spring session in 20 years— **a credit card bill, anti-contract waste, the financial fraud bill, a major housing bill, F.D.I.C. finance bill, let alone the supplemental**,' Mr. Emanuel said, rattling off bills in an interview late last week. (periodical)

In (85), Communist Party members are more likely than non-Party members to support the Rosenbergs and yet urge the prosecution of three Communists framed for spying in Prague. This scalar relationship cannot be translated directly into an entailment relation, but we know that the more loyal someone is to a cause the less likely they are to question its actions. We can thus accommodate that, if loyal Party members are questioning the author's double standard, then others are also questioning it. Similarly, in (86), the supplemental bill (officially, the Supplemental Appropriations Act of 2009) is easier than other bills to pass. Given how the legislative process works— when the majority party can muster enough votes to pass a controversial bill, they will have the votes to pass more routine legislation— if the Congress is about to pass a credit card or anticontract waste bill, then it will pass the supplemental bill.

4.6.3 Putting together the pieces

We can now see why removing negation from the *let alone* sentence in (34) is infelicitous. The correlate and remnant do not, in this case, directly determine the entailment relationship between the two conjuncts, since they do not form a Horn scale. Nonetheless, in context, the order of the *the Berkeley hills* and *Mt. Everest* leads to a presupposition failure:

- (87) Q: What has Oswald climbed?
 A: #Oswald has climbed the Berkeley hills, let alone Mt. Everest.
 At-issue entailment: **climb(the-berkeley-hills)(oswald)**
 Presupposition: $\lambda w(\text{climb}_w(\text{the-berkeley-hills})(\text{oswald}) \dashrightarrow \text{climb}_w(\text{mt-everest})(\text{oswald}))$

In the default context, without negation, it is hard to draw the inference that if Oswald has climbed the Berkeley hills, he has also climbed Mt. Everest. If the Berkeley hills are easy to climb, then the

fact that he has climbed them does not tell us anything about whether he has climbed Mt. Everest. The presupposition in (87) nonetheless requires this inferential relationship. For similar reasons, the exchange in (88) is also infelicitous, though *let alone* does occur in a downward entailing environment.

- (88) Q: Has Oswald climbed the Berkeley hills?
 A: #Oswald hasn't climbed Mt. Everest, let alone the Berkeley hills.
 At-issue entailment: $\lambda_w(\neg\text{climb}_w(\text{mt-everest})(\text{oswald}))$
 Presupposition: $\lambda_w(\neg\text{climb}_w(\text{mt-everest})(\text{oswald})) \dashrightarrow$
 $\neg\text{climb}_w(\text{the-berkeley-hills})(\text{oswald})$

The order of the correlate and remnant has been flipped. In the same context we have been considering, this causes the presupposition in (88) to fail. Since Mt. Everest is the tallest mountain in the world, if Oswald has not climbed it, we are unable to infer anything about mountains that are significantly easier to ascend, such as the Berkeley hills.²³

Though, as we saw in the preceding section, *let alone* often occurs in nondownward entailing environments, it is simply a fact that most *let alone* sentences contain a monotone decreasing function of some sort. There is one possible reason, that I see, for this bias in corpus frequency for downward entailing environments. I find all of the naturally occurring examples I have included here felicitous, but not all speakers of English do. While I only have anecdotal evidence to offer, many speakers I have consulted judge *let alone* sentences that do not contain a monotone decreasing function as infelicitous. If the examples I have culled from the British National Corpus and other sources using the internet represent the cumulated speech of different populations—populations that may or may not restrict the distribution of *let alone* to downward entailing environments—then both variants should show up. And, they might show up in different proportions, depending on the relative size of the dialects.

²³Larry Horn suggests that some speakers might actually find (88) felicitous. He provides the following naturally occurring examples (sent to him by Paul Kay):

- (i) These were women who were doing radio way before we had the idea let alone were born.
- (ii) Without Clinton Portis, I don't think this team can go deep in the playoffs, let alone get in.

In both examples, the correlate and remnant occur in a downward entailing environment, and yet it is the correlate that is located higher on a pragmatic scale than the remnant. In (i), having an idea can only occur after being born; and, in (ii), going deep in the playoffs is only possible after getting into the playoffs. To these examples, we can add a few more internet attestations involving logical scales:

- (iii) IT WAS HOT! I lived in the pool for 2 days. There was a bar IN THE POOL. Thats right folks, all you had to do was walk up to the bar and you were in the pool sipping your drink. It was the greatest. What was not so great is that the water never got cold, let alone cool. The ocean was tepid, definitely no chill when you got in. (internet)
- (iv) *Batman Begins* is the only Batman movie that was excellent let alone good. Im so freaking excited for *The Dark Knight!!* (internet)

I personally find such examples infelicitous. Some speakers seem to have a type of *let alone* that is synonymous with *not to mention*, which can be substituted in (i–iv). An alternate, but not necessarily mutually exclusive, analysis is that these examples all involve metalinguistic negation. If so, then the correlate and remnant in these examples do not actually in occur in a downward entailing environment, and the order of the correlate and remnant is the expected one.

At this point, I leave the discussion of *let alone* as a negative polarity item. It seems relatively clear that, at least for some speakers, it is not a negative polarity item. Removing the negative element from a felicitous sentence can nonetheless result in infelicity because of *let alone*'s presupposition. It fails if the relationship between the correlate and remnant is kept constant in an upward entailing environment. There may be speakers for whom *let alone* actually is a negative polarity item. If so, future research will have to clarify whether this variation is similar to that found with negative polarity items like *anymore*, which for some speakers is similarly not restricted to downward entailing contexts (see, e.g., Parker 1975).

4.7 Extending the analysis to *even*

In Chapter 2, I outlined semantic parallels between *let alone* and its one-place counterpart *even*. But, while removing negation from a *let alone* sentence can lead to infelicity, this does not seem to be true of *even*:

- (89) a. Oswald hasn't even climbed [the Berkeley HILLS]_F.
b. Oswald has even climbed [the Berkeley HILLS]_F.

These sentences are felicitous in very different contexts, even though they only seem to differ in the presence or absence of negation. When *the Berkeley hills* occurs in the scope of negation, as in (89a), we construe it as a mountain that is easy to climb (maybe because of its height). When, however, *the Berkeley hills* occurs in an upward entailing environment, as in (89b), it must be construed (perhaps incorrectly) as a hard mountain to climb. This variability arises precisely because of the semantic parallels between *even* and *let alone*.

The first comprehensive treatment of *even*'s meaning is due to Karttunen and Peters (1979:23–33), who ascribe it three distinct meaning components. In addition to the prejacent, there is an existential presupposition that conveys there is another proposition that is true at the world of evaluation. And, the scalar presupposition conveys that the prejacent is the least likely proposition among a set of alternatives. The sentence in (89b) thus has, under this account, the following meaning:

- (90) Prejacent: **climb(the-berkeley-hills)(oswald)**
Existential presupposition: $\lambda w \exists x (x \neq \mathbf{the-berkeley-hills} \wedge \mathbf{climb}(x)(\mathbf{oswald}))$
Scalar presupposition: $\forall x (x \neq \mathbf{the-berkeley-hills} \rightarrow \mathbf{climb}(\mathbf{the-berkeley-hills})(\mathbf{oswald}) < \mathbf{climb}(x)(\mathbf{oswald}))$

The status of the prejacent is relatively uncontroversial. Horn (1969:106) observes that it is the at-issue entailment of an *even* sentence. The status of the other components has, since Karttunen and Peters' original proposal, been more heavily contested.²⁴

There is some reason, in particular, to question whether *even* really requires the prejacent to be the least likely proposition among some set of alternatives — an idea that originates with Fauconnier (1976:32). Kay (1990:89f.) observes that in the examples in (91), the prejacent of the *even* sentence clearly cannot be the least likely proposition in any absolute sense.

²⁴My understanding of *even* has been influenced greatly by Kay (1990) and Rullmann (1997), and the discussion here can be viewed largely as a presentation of their ideas.

- (91) a. Not only did Mary win her first round match, she even made it to the semifinals.
 b. The administration was so bewildered that they even had lieutenant colonels making major policy decisions.

(Kay 1990:89)

In the context of a championship, as in (91a), it is even less likely that Mary will get into the finals or win the championship. And, in (91b), if it is unlikely to have lieutenant colonels making policy decisions, it would clearly be more unlikely for a corporal, or a private, to be making them.

Nor does it seem as if the two propositions have to be related by likelihood, an idea that originates in Fillmore's (1965:67f.) intuition that *even* conveys a violated expectation. Kay argues (p. 82ff.) that, while many *even* sentences can be characterized in this way, it is not a necessary condition:

- (92) A: It looks as if Mary is doing well at Consolidated Wiget. George, the second vice president, likes her work.
 B: That's nothing. Even [BILL]_F, the president, likes her work. (Kay 1990:84)

B's use of *even* is felicitous even if we do not presuppose that the prejacent—that the president likes Mary's work—is less likely than A's preceding utterance—that the second vice president likes her work. Intuitively, all we need to know is that, if the president likes her work, it is reasonable to infer that the second vice president likes her work (since Bill's approval counts for more than George's). A more striking example can be found in (93):

- (93) Every person who donates even [one CENT]_F will get a gift.

There is no sense in which one cent has to be the most likely donation. Most people might in fact give ten dollars. What this sentence seems to presuppose, rather, is that one cent is lower than some other amount, and that one gets a gift regardless of whether one donates this larger sum or just one cent.

To capture this pair of intuitions, I propose, following Kay's lead, to analyze *even* as bearing a single presupposition that relates the prejacent to some other proposition on the basis of contextual entailment.²⁵ B's reply in (92) thus has the meaning shown in (94).

- (94) At-issue entailment: **like(her-work)(bill)**
 Presupposition: $\lambda w \exists x (x \neq \mathbf{bill} \wedge \mathbf{like}_w(\mathbf{her-work})(\mathbf{bill}) \dashrightarrow \mathbf{like}_w(\mathbf{her-work})(x))$

This *even* sentence presupposes that there is some proposition distinct from the at-issue entailment that follows from it—namely, that Bill likes her work. This presupposition is satisfied, in this context, by A's preceding utterance, that George likes her work. Given the scalar relationship between Bill and George, if the president likes her work, it follows that the second vice president likes it.

There is something conspicuously missing from the meaning in (94), the existential presupposition. We have, as Rullmann (1997:58) points out, the clear intuition that *even* does entail the truth of some alternative to the prejacent. It certainly cannot be canceled, since the following sentence and its continuation are contradictory:

- (95) We even invited [BILL]_F, although we didn't invite anyone else. (Rullmann 1997:58)

²⁵Ducrot (1973), Fauconnier (1975, 1976), and Anscombe and Ducrot (1983) make kindred proposals.

But, as we saw in §4.4, just because some meaning component of a sentence cannot be canceled does not mean that it is necessarily part of the sentence’s descriptive content. It can be a contextual entailment that arises when the sentence’s at-issue content is added to the common ground. That is exactly what the existential ‘presupposition’ is. In (94), *even* presupposes that the prejacent entails some other proposition—that is, if Bill likes her work, then somebody else likes her work. When the at-issue entailment is added to a common ground satisfying this presupposition, it will entail that somebody other than Bill likes her work. Thus, we can eliminate the existential presupposition from the lexical content of *even*, while still accounting for the intuition that motivated it.

With a meaning in hand for *even*, we can see where the effect in (89) comes from. That pair of sentences is repeated in (96). They both presuppose that there is some other proposition entailed by the prejacent.

- (96) a. Oswald hasn’t even climbed [the Berkeley HILLS]_F.
 At-issue entailment: $\lambda_w(\neg\text{climb}_w(\text{the-berkeley-hills})(\text{oswald}))$
 Presupposition: $\lambda_w\exists x(x \neq \text{the-berkeley-hills} \wedge \neg\text{climb}_w(\text{the-berkeley-hills})(\text{oswald}) \dashrightarrow \neg\text{climb}_w(x)(\text{oswald}))$
- b. Oswald has even climbed [the Berkeley HILLS]_F.
 At-issue entailment: $\lambda_w(\neg\text{understand}_w(\text{syntactic-structures})(\text{bill}))$
 Presupposition: $\lambda_w\exists x(x \neq \text{the-berkeley-hills} \wedge \text{climb}_w(\text{the-berkeley-hills})(\text{oswald}) \dashrightarrow \text{climb}_w(x)(\text{oswald}))$

If somebody is able to climb a harder mountain, then they will be able to climb an easier one. We thus construe the Berkeley hills as an easy mountain to climb in (96a), since it occurs in a downward entailing context. If Oswald’s failure to climb the Berkeley hills entails his failure to climb another mountain, then that mountain must be harder to climb. Conversely, in (96b), if Oswald’s climbing the Berkeley hills entails his climbing some other mountain, then that mountain must be easier to climb than the Berkeley hills.²⁶

4.8 Summary

The scalar additives, like the adversatives, seem to come in pairs. As we saw at the beginning of this chapter, *let alone*’s syntax is crosscategorical, just like its one-place counterpart. It is a coordinator that can take two arguments of essentially any type. But, when *let alone*’s two arguments are verb phrases or clauses, the second one is reduced to a fragment.

As for *let alone*’s meaning, our intuitions might lead us to think that it conveys logical conjunction. I argued, however, that *let alone*’s at-issue entailment is a single atomic proposition, though its presupposition gives rise to another contextual entailment. Usually these entailments are identi-

²⁶I assume here that *even* takes wide scope over negation or any other monotone decreasing expression, as Karttunen and Peters (1979), and more recently Wilkinson (1996), argue. But whether this is possible and, if so how it happens, has been called into question by Rooth (1985:139–163). He proposes that, instead of taking scope over negation, the *even* in downward entailing sentences is a negative polarity item whose presupposition is the inverse of the regular *even* (the prejacent is entailed by some other proposition). As Rullmann (1997) shows, once we abandon Karttunen and Peters’ semantics for *even* in favor of those given here, it becomes impossible to tell the two possibilities apart empirically. I have thus opted for the analysis that makes the comparison to *let alone* most transparent.

cal to what we would get from a conjunction, but sentences containing *barely* have an unexpected meaning that can only arise if the ‘second conjunct’ is a contextual entailment.

The meaning of a *let alone* sentence can be given schematically as in (97). In addition to its at-issue entailment, it presupposes that this proposition contextually entails another proposition.

(97) ψ let alone ϕ
At-issue: ψ
Presupposition: $\psi \dashv\vdash \phi$

(98) even ψ
At-issue: ψ
Presupposition: $\exists \mathbf{p}(\mathbf{p} \neq \psi \wedge \psi \dashv\vdash \mathbf{p})$

The meaning of *even*, given schematically in (98), is parallel. It has an at-issue entailment consisting of a single, atomic proposition, and it, too, presupposes that there is some other proposition that the at-issue proposition contextually entails.

This concludes my detailed treatments of the adversatives and scalar additives. In the next chapter, I argue that two properties of these lexical items—crosscategoriality and evoking multiple alternatives—give rise to the restricted distribution of focus. Once, that is, we understand how they interact with the question under discussion.

Chapter 5

A theory of association with focus

5.1 Where we were

In Chapters 3 and 4, I argued that the two-place associating expressions adversative *but* and *let alone* have the following properties:

(i) *Crosscategoriality*

An associating expression can take subparts of the sentence as its argument.

(ii) *Multiple alternatives*

An associating expression evokes more than one alternative.

Both adversative *but* and *let alone* are coordinators, and they can take two arguments of essentially any type. They also evoke a pair of propositional alternatives. Adversative *but* describes both in its at-issue component, while *let alone* relates them by contextual entailment in a presupposition. These two properties, I showed in Chapter 2, also characterize the corresponding one-place associating expressions. Both *only* and *even* are adverbs that adjoin to any major sentence constituent. They describe one proposition and quantify over all its alternatives. These two factors interact, I argue, to create the associating expressions' restriction on the distribution of focus. This interaction crucially involves the question under discussion.

In constructing my own account of association with focus, I have been inspired by Beaver and Clark's recent (2008) treatment of *only*. While they adopt Roberts' (1996) question-under-discussion framework, they depart to varying degrees from her original vision by positing a direct and conventional connection between some lexical items and the question under discussion. For Beaver and Clark, associating expressions, including *only*, make reference in their lexical entries to the question under discussion.

I return to Roberts' original framework, strengthening it by incorporating some of the insights from Groenendijk's (1999) logic of interrogation. Briefly, associating expressions restrict the distribution of focus because they can only coherently answer a restricted range of questions—those questions, specifically, where the *wh*-phrase corresponds to a constituent inside the expression's sister or sisters. A constraint enforcing question-answer congruence, such as Beaver and Clark's Focus Principle (p. 37), does the rest:

(1) *Focus Principle*

A declarative sentence must be congruent to the question under discussion.

There must be a focus on the constituent corresponding to the wh-phrase of the question under discussion. Otherwise, the sentence is not congruent, and hence infelicitous.

While our accounts differ, Beaver and Clark, Roberts, and I share a common perspective on focus. Focus is a formal reflection of certain conversational structures. To understand association with focus, then, we need to look at how associating expressions interact with other sentences in discourse. The question-under-discussion framework is a tool we can use to model this interaction. This discourse-oriented approach is relatively new. The literature on association with focus since Jackendoff (1972) has been dominated by what we might call semantic approaches to focus. In Rooth's (1985) alternative semantics, for instance, focus is represented model theoretically. All natural language expressions receive two interpretations: the ordinary meaning we are used to seeing and a focus meaning that corresponds to sets of ordinary meanings. Associating expressions make reference to this other dimension of focus meanings, either directly or indirectly, to produce the characteristic properties of association with focus. Positing such a grammatical relationship between associating expressions and focus does not answer the question I have been trying to answer here. Why do *only* and *even*—and their two-place counterparts, adversative *but* and *let alone*—associate with focus?

I start with the semantic approach to association with focus. In §5.2, I argue that Rooth's alternative semantics account cannot derive the distributional restriction on focus without making stipulations that lose sight of focus' essential pragmatic nature. Then, in §5.3, I turn to the question-under-discussion based account of Roberts, which Beaver and Clark criticize for not deriving *only*'s semantic interaction with focus. Their own account, though, which makes direct lexical reference to the question under discussion, cannot derive *only*'s distributional restriction on focus. The problems with Roberts' original account can be fixed, I argue in §5.4, by adopting the stricter notion of Relevance in Groenendijk's (1999) logic of interrogation. This allows us to treat, as I show in §5.5, *only*'s semantic interaction with focus as just another case of contextual domain restriction. In this system, the syntactic and semantic properties of the associating expressions interact with the question under discussion to restrict the distribution of focus, which I demonstrate for the adversatives in §5.6 and the scalar additives in §5.7. Finally, in §5.8, I discuss contrastive focus and its relevance to the two-place associating expressions.

5.2 Alternative semantics for focus

In Rooth's (1985) alternative semantics, all natural language expressions have two semantic values: an ordinary semantic value given by the interpretation function $\llbracket \cdot \rrbracket^o$ and a focus semantic value given by the focus interpretation function $\llbracket \cdot \rrbracket^f$. The focus semantic value of an expression is the set comprising its alternatives. What this is will depend on whether the expression contains a focus, and if it does, where that focus is located. To see why, we should look at Rooth's (1985:14) recursive definition in (2).

- (2) *Recursive definition for focus semantic values*
 $\llbracket \alpha \rrbracket^f$, where $\llbracket \alpha \rrbracket^o$ is of type τ , is
- i. D_τ , the set of objects in the model matching $\llbracket \alpha \rrbracket^o$ in type, if α bears the feature F;
 - ii. $\{\llbracket \alpha \rrbracket^o\}$, the unit set containing $\llbracket \alpha \rrbracket^o$, if α does not bear the feature F and is atomic; or
 - iii. the set of objects that can be obtained by picking one element from the focus semantic value of each component phrase of α and applying the semantic rule for α to this sequence of elements, if α does not bear the feature F and is nonatomic.

The focus semantic value of an atomic expression containing a focus is the set of objects of the same type. If there is no focus, then it is simply the unit set containing the ordinary semantic value of the expression. If the expression is complex, then figuring out the focus semantic value is a bit more involved. Take, for instance, the sentence in (3) which has a narrow focus on the direct object *Dudley*.

- (3) Marion feeds $[DUDley]_F$.

Determining the focus semantic value of the entire sentence in (3)—a nonatomic expression that is not F-marked (only a subpart of it is F-marked)—falls under clause iii of (2). We have to look at the focus semantic values of the sentence’s subconstituents, as in (4b). The derivation of the sentence’s ordinary semantic value is provided in (4a) for comparison.

- (4)
- | | |
|--|---|
| <p>a. Ordinary semantic value</p> $\text{feed}(\text{dudley})(\text{marion}) : \langle s, t \rangle$ | <p>b. Focus semantic value</p> $\{\text{feed}(x)(\text{marion}) \mid x \in D_e\}$ |
|--|---|

The focus semantic value for the focused constituent *Dudley* is determined by clause i of (2). Since $\llbracket [DUDley]_F \rrbracket^o$ is of type e , this is the set of entities. The main verb *feeds* is not focused, so its focus semantic value, according to clause ii, is simply the unit set containing its ordinary semantic value. According to clause iii, the focus semantic value of the constituent *feeds Dudley* is then derived by taking each of the elements in the focus semantic value of each subconstituent and combining them pointwise by function application. This produces a set of properties that vary in the identity of the internal argument, $\{\text{feed}(x) \mid x \in D_e\}$, since only the direct object has a focus semantic value that contains more than one element. This set is combined with the external argument in a similar fashion to yield the focus semantic value of the entire sentence, a set of propositions that vary in the identity of the internal argument. This is exactly the position of focus.

Rooth’s alternative semantics for focus is useful for defining question-answer congruence. Recall that an answer is congruent to a question just in case the focus corresponds to the wh-phrase of the question. Focus meanings are easy to compare to questions in Hamblin’s (1973) semantics for questions. They denote sets of propositions, and so are the same semantic type as focus meanings:

- (5) Q: $\llbracket \text{Who does Marion feed?} \rrbracket^o = \{\mathbf{feed}(x)(\mathbf{marion}) \mid x \in D_e\}$
 A1: $\# \llbracket [\text{MARion}]_F \text{ feeds Dudley} \rrbracket^f = \{\mathbf{feed}(\mathbf{dudley})(x) \mid x \in D_e\}$
 A2: $\llbracket \text{Marion feeds } [\text{DUDley}]_F \rrbracket^f = \{\mathbf{feed}(x)(\mathbf{marion}) \mid x \in D_e\}$

The two declarative sentences in (5) are truth-conditionally identical. Both serve as coherent answers to the question under discussion, but only the second answer is congruent. This is because its focus meaning, the set of propositions of the form ‘Marion feeds x ’, is identical to the meaning of the question. Congruence is thus defined as follows:

(6) *Congruence*

A declarative sentence α is CONGRUENT to a question β iff $\llbracket \alpha \rrbracket^f = \llbracket \beta \rrbracket^o$.

A declarative sentence is congruent to a question just in case its focus meaning is equal to the ordinary meaning of the question. This is not the case for the first answer in (5) since its focus meaning is the set of propositions of the form ‘ x feeds Dudley’.

In alternative semantics, while focus meanings can be used to define congruence, that is not their sole, or even primary, function. Lexical items can take focus meanings as their arguments. Rooth (1992) divides theories of how ordinary meanings interact with focus meanings—or, as he calls it, theories of focus interpretation—into two broad classes: strong theories and weak ones. In a strong theory, the expressions that can make reference to the focus dimension of meaning are limited, potentially to just one. This more restrictive theory of meaning predicts that focus can be manipulated only in a limited way. A weak theory, in contrast, imposes no such restriction on how ordinary and focus meanings can interact. Such a theory would be less restrictive since it would make no predictions about the types of focus interactions we expect to find.

5.2.1 The classic Roothian picture

To see what a strong theory would look like, we can turn again to Rooth (1992). He proposes that English has a single expression able to see focus meanings, so to speak. This is a null operator, written \sim , that is adjoined freely at the level of L(ogical) F(orm). Adjoining a squiggle operator, as I will call it, to a given phrase forces a focus somewhere inside it. This arises because of a presupposition relating the operator’s two arguments, the phrase ϕ to which it is adjoined and a free variable v :

(7) *Presupposition of the squiggle operator (\sim)*

$\phi \sim v$ presupposes that

- i. $v \subseteq \llbracket \phi \rrbracket^f$;
- ii. $\llbracket \phi \rrbracket^o \in v$; and
- iii. $\exists x(x \in v \wedge x \neq \llbracket \phi \rrbracket^o)$.

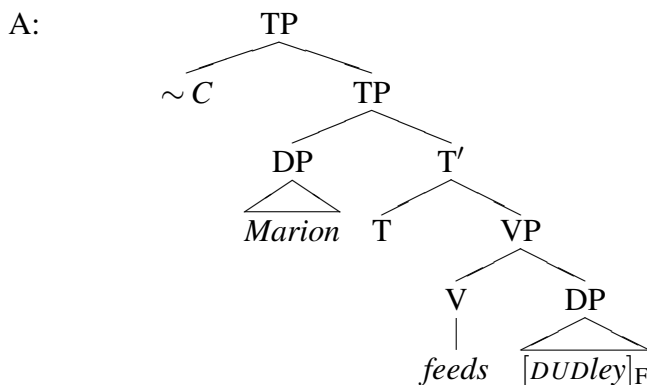
The presupposition in (7) restricts the value of the free variable, v , to a subset of the focus semantic value of the phrase the squiggle operator adjoins to, ϕ . The value of v must moreover contain both the ordinary semantic value of ϕ as well as some other element.¹ This is what forces the occurrence

¹Rooth actually states the presupposition disjunctively, so that it relates its sister and either a set, as in (7), or an individual. He does this in order to unify the interpretation of different kinds of focus structures, including contrastive focus, the focus resulting from question-answer congruence, and association with focus. Only the set case is relevant here.

of a focus somewhere in the scope of the squiggle operator, since the focus meaning of ϕ will be a nonunit set only when it contains a focus.

To see the squiggle operator in action, take the simple exchange in (5). To enforce congruence to the question under discussion, a squiggle operator is adjoined to the root node of the answer:

(8) Q: $\llbracket \text{Who does Marion feed?} \rrbracket^o = \{\mathbf{feed}(x)(\mathbf{marion}) \mid x \in D_e\}$



The free variable introduced by the squiggle operator must find an antecedent that satisfies the presupposition in (7). This can be the question under discussion since its denotation is a set of propositions of the form ‘Marion feeds x ’. Because focus is located on the object *Dudley*, the focus meaning of the TP sister of the squiggle operator is the exact same set of propositions, i.e. $\llbracket \text{TP} \rrbracket^f = \{\mathbf{feed}(x)(\mathbf{marion}) \mid x \in D_e\}$. Subclause i of the presupposition in (7) is satisfied since the question under discussion is, in fact, a subset of this set. Subclauses ii and iii are, too: the proposition that Mary feeds Dudley is a member of the TP’s focus meaning, and so is at least one other proposition.

Rooth intends to account for the semantic effects of association with focus as well. This happens through domain restriction of the usual type. The truth value of quantificational statements, like the universally quantified one in (9), depends on the context of use.

(9) Every child eats sushi.

If, for instance, we are talking about the extent to which children all over the world eat sushi, then the sentence in (9) would surely be false: there are certainly many children in the world who have never heard of sushi, much less eaten it. In a different context, however—say, in a Berkeley school where sushi is offered once a week for lunch—(9) might very well be true, since we would only be considering the set of children who attend the school. Contextual domain restriction can be represented in logical form with a free variable:

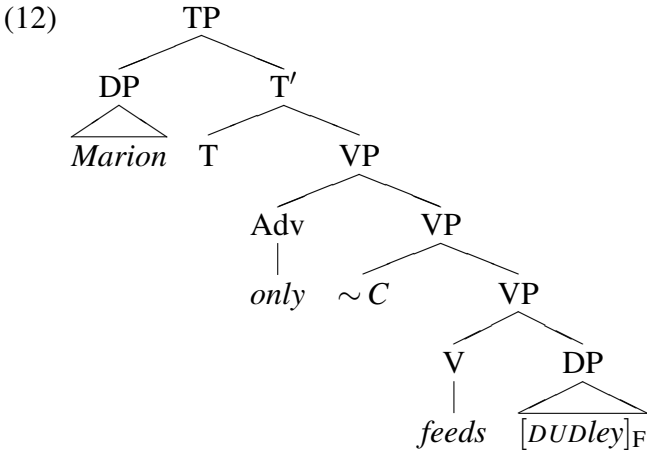
(10) $\llbracket (9) \rrbracket^o = \lambda w \forall x (x \in C \wedge \mathbf{child}(x) \rightarrow \mathbf{eat}_w(\mathbf{sushi})(x))$

The sentence in (10) is true just in case all children in C eat sushi. Since this a context-dependent meaning, its truth value will vary with the assignment of C .

Like *every*, *only*, too, expresses universal quantification, and by analogy Rooth adds a free variable to its restriction (p. 77f.), as in (11).

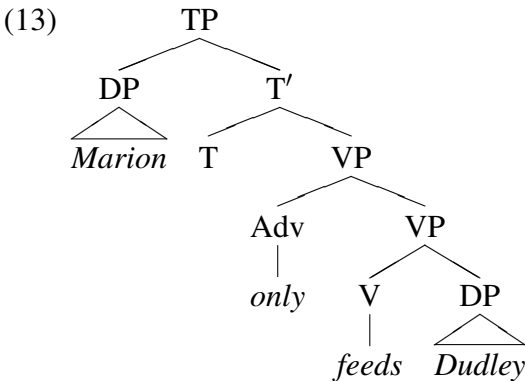
(11) $\llbracket \text{Marion only feeds } [DUDley]_F \rrbracket^o = \lambda w \forall \mathbf{f} (\mathbf{f} \in C \wedge \mathbf{f}_w(\mathbf{marion}) \rightarrow \mathbf{f} = \mathbf{feed}(\mathbf{dudley}))$

If, when *only* adjoins to VP, it quantifies over properties, then the sentence in (11) expresses that every property in C that is true of Marion is the property of feeding Dudley. The squiggle operator, which adjoins to the verb phrase below *only*, helps to determine what C is:



In (12), the free variable C introduced by the squiggle operator must find an antecedent satisfying the presupposition in (7)—a subset of the focus semantic value of the VP that contains at least one element that is distinct from its sister’s ordinary semantic value. In other words, $C \subseteq \llbracket \text{feeds } [\text{DUDley}]_F \rrbracket^f = \{\mathbf{feed}(x) \mid x \in D_e\}$. This set serves as the antecedent of the free variable introduced by *only* as well, so that *only* is restricted to quantifying—albeit indirectly—over a subset of the VP’s focus semantic value. (11) is true just in case the only thing that Marion feeds is Dudley.

Rooth’s theory of association with focus has some desirable properties. It links the semantic variability of *only* to question-answer congruence. This is made possible by the squiggle operator, which is responsible for both. But, there is a shortcoming. Adjunction of squiggle operators, at least as Rooth imagined it, is purely optional (p. 108). There is thus nothing that rules out an LF like (13).



Since there is no squiggle operator present, there is no focus contained within the sister of *only*. And, since, in Rooth’s strong theory, no other expressions can make reference to focus meanings, there is no way of forcing the presence of a focus.²

²There is actually another problem with Rooth’s account. The squiggle operator uses up, so to speak, the focus in its scope:

(i) $\llbracket \phi \sim C \rrbracket^f = \{\llbracket \phi \rrbracket^o\}$ (Rooth 1992:95)

Since the focus meaning of the phrase containing a squiggle operator is equal to the set containing the ordinary meaning of the squiggle operator’s sister, any foci it contains will not be visible at the sentence level, and hence they

5.2.2 A structured approach

Alternative semantics is not the only way of representing focus. Structured meanings can also be used (Klein and von Stechow 1982, Jacobs 1983, von Stechow 1982, 1991, Krifka 1992a,b), though this yields what Rooth (1992) would call a weak theory of focus interpretation.

In a structured meanings approach, expressions containing a focus denote an ordered pair consisting of the BACKGROUND — the function produced by abstracting over the focus — and the focus itself. This structured meaning can be converted into an ordinary meaning by applying the background to the focus. Take the following sentence with a focused direct object:

$$(14) \quad \llbracket \text{Marion feeds } [\text{DUDley}]_F \rrbracket = \langle \lambda x(\text{feed}(x)(\text{marion})), \text{dudley} \rangle$$

The structured meaning consists of a property — being fed by Marion — and an individual — Dudley. Applying this property to the focus produces the proposition that Marion fed Dudley.

Associating expressions take a structured meaning as their argument and make use of its two parts to produce the correct meaning. *Only*, for instance, quantifies over elements in the denotation of the background that are ‘comparable’ (this is what \approx is meant to convey) to the focus (Krifka 1992a:19):

$$(15) \quad \llbracket \text{only} \rrbracket(\langle \alpha, \beta \rangle) = \forall x(x \approx \beta \wedge \alpha(x) \rightarrow x = \beta)$$

Depending on where focus is located, the background and focus will be different, and so the truth conditions of an *only* sentence will be different. Without saying anything more, using the meanings in this way derives the obligatory presence of a focus somewhere inside *only*’s sister. *Only* can only take a structured meaning as its argument, and since structured meanings contain a focus by definition, *only* will always associate with a focus.³

The problem with such a weak theory of focus interpretation is that it makes no predictions about the expressions that can make reference to focus. *Only* does, but what else? Why doesn’t *cat* associate with focus? This lack of predictiveness stems, it seems to me, from a more fundamental problem with using structured meanings to represent focus. Focus is the formal reflection of the relationship of sentences in the discourse. But the structured meanings approach treats focus entirely

will not be available for calculating question-answer congruence.

As von Stechow (1994:70–74) observes, however, these foci do count for the purposes of congruence. He notes (p. 61) the contrast in (ii), which he attributes to a manuscript by Roger Schwarzschild (cf. Schwarzschild 1997:5):

- (ii) Q: Who did John invite for dinner?
 A1: He only invited [Andre]_F for dinner.
 A2: # He only invited Andre [for Dinner]_F.
 A3: # He only invited [Andre]_F [for Dinner]_F.

The first answer is felicitous since the focus on *Andre*, which is contained within *only*’s sister, corresponds to the wh-phrase of the question. The second answer is incongruous, however, since the PP *for dinner* is focused. But this answer is also not a coherent answer to the question under discussion (given *only*’s semantic interaction with focus). The third answer is coherent, but it is not congruent since the focus on *for dinner* does not correspond to a wh-phrase in the question. If the squiggle operator used up these foci, as Rooth proposes, we would expect A3 to be just as felicitous as A1. To remedy this flaw in the Roothian account, von Stechow makes *only* a sentential operator.

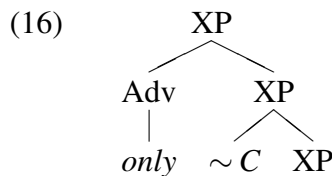
³Importantly, once the meaning of *only* has been folded in, the expression is no longer a structured meaning; it is a simple expression of type *t*. The information that identifies the position of the focus has been lost. See footnote 2 for why this is not desirable.

semantically, reducing it entirely to an aspect of model-theoretic interpretation. As a consequence, the unique properties of the associating expressions can only be treated as a purely semantic fact about these expression. Any successful theory of association with focus has to acknowledge that focus is, at its core, a discourse-related phenomenon.⁴

5.2.3 An ‘intermediate’ alternative

Before considering accounts of association with focus based on the question-under-discussion framework, I first want to consider a modification of Rooth’s (1992) strong theory. A strong theory of focus interpretation embodies a strong hypothesis, but it is not able to account for *only*’s distributional restriction on focus. Weak theories do not, however, have the same problem. In a structured meanings approach, the focus associated with *only* is obligatory. Perhaps there is a way of weakening Rooth’s (1992) strong theory so that it derives the distributional restriction on focus?

Rooth (1996b) proposes exactly such an intermediate theory. He supposes that some squiggle operators are obligatory. There is, for instance, always one adjoined to the sister of *only*. Rooth implements this by imposing a constraint on the phrase-structural configurations *only* can appear in:



Only can adjoin solely to XPs to which a squiggle operator is also adjoined. Since the presence of a squiggle operator entails the presence of a focus, this ensures the presence of a focus inside XP. Rooth’s move preserves one of the most desirable aspects of his original proposal. *Only*’s semantic interaction with focus has the same analytical source as question-answer congruence. The squiggle operator, which enforces question-answer congruence, is anaphoric to a contextually salient set of alternatives that restricts the quantificational domain of *only*.

⁴Structured meanings have, more generally, been criticized for being too powerful. They allow for interactions between focus and the ordinary meaning of a sentence that do not seem to exist in natural language. To show this point, Rooth (1996a) proposes a hypothetical verb *tolf*, whose use is illustrated in (i).

- (i) a. I tolfed that [he]_F resembles her.
‘I told him that he resembles her.’
 - b. I tolfed that he resembles [her]_F.
‘I told her that he resembles her.’
 - c. I tolfed that [he]_F resembles [her]_F.
‘I told him and her that he resembles her.’
- (Rooth 1996a:278)

The meaning of a sentence ‘ α tolf ϕ ’ can be paraphrased as ‘ α tell β that ϕ ’, where β is the focus (or foci) of ϕ . The recipient of a tolfing event is, in other words, the focus of its clausal complement. Such a predicate is possible in a structured meanings approach since the focus is kept syntactically distinct from the background and is therefore accessible to predicates like *tolf*. This is impossible in alternative semantics since the focused element is never itself accessible to ordinary meanings. Focus introduces a set of alternatives, but information about which of these alternatives contains the focused element itself is lost.

This comes at a cost. In order to make associated foci obligatory, Rooth must posit phrase-structural constraints found nowhere else in syntax. In (16), one adjunct subcategorizes for another adjunct. This syntactic constraint, moreover, posits an arbitrary dependency between two lexical items—*only* and the squiggle operator—in order to make some foci obligatory. But it is not just associated foci that are obligatory. So-called free foci—foci that serve to enforce question-answer congruence and nothing else—are also obligatory. It is not possible for a declarative sentence (or any uttered sentence, for that matter) to lack a focus:

- (17) Q: Who did John marry?
 A1: He married [Sally]_F.
 A2: #He married Sally.

An answer like A2, which contains no focused elements, is simple impossible. Do all sentences contain an obligatory squiggle operator? If so, what subcategorizes for them when *only* is not present?

In what follows, I propose a theory of association with focus in which the position of any focus is determined entirely by the question under discussion. Because of the syntax and lexical semantics of associating expressions, sentences that contain them can only coherently answer a restricted set of questions. These are the questions that correspond to a focus inside the argument or arguments of the associating expression. The distinction between strong and weak theories of focus interpretation, in the end, turns out to be somewhat beside the point. We only need to worry about constraining our theory of focus interpretation if expressions make reference to focus meanings. If not—if ordinary meanings are never functions on focus meanings—then the issue does not arise to begin with.

5.3 Questions under discussion

I start with Roberts' (1996, 2004) question-under-discussion framework, which—recall from Chapter 2—is a way of structuring the discourse. Under this view, one purpose of information-exchanging conversations is to answer the big question *What is the way things are?*, a goal that participants work towards by answering a sequence of questions that are more manageable to answer. These questions, which have been accepted by discourse participants as answerable, though not yet answered, are contained in the question-under-discussion stack, a set of ordered questions:

- (18) *QUD*, the QUESTION-UNDER-DISCUSSION STACK, is a function from M (the moves in the discourse) to ordered subsets of $Q \cap Acc$ (where, for the set of questions Q and the set of accepted moves, $Q \subseteq M$ and $Acc \subseteq M$) are such that for all $m \in M$:
- i. for all $q \in Q \cap Acc$, $q \in QUD(m)$ iff
 - (a) $q < m$ (i.e. neither m nor any subsequent questions are included), and
 - (b) $CG(m)$ (i.e. the common ground just prior to being updated with m) fails to entail an answer to q and q has not been determined to be practically unanswerable;
 - ii. $QUD(m)$ is (totally) ordered by $<$; and
 - iii. for all $q, q' \in QUD(m)$, if $q < q'$, then the complete answer to q' contextually entails a partial answer to q . (Roberts 1996:100)

While the questions in the stack are ordered by precedence, this ordering is related, by clause iii, to the questions' informativeness relative to one another. The complete answer to a question located after another question in the stack contextually entails a partial answer to the preceding question.

Given this informativeness requirement, it is clear that not all the questions in a given discourse will fit onto a single stack. Take, for instance, Roberts' discourse from before:

- (19) Q1: Who ate what?
 Q1a: What did Hilary eat?
 Q1a_i: Did Hilary eat bagels?
 Q1a_{ii}: Did Hilary eat tofu?
 Q1b: What did Robin eat?
 Q1b_i: Did Robin eat bagels?
 Q1b_{ii}: Did Robin eat tofu?

While it is clear that Q1 entails Q1a and that Q1 entails Q1b, there is no sense in which Q1a entails Q1b or Q1b entails Q1a. Any answer to the question of what Hilary ate will not serve as an answer to the question of what Robin ate, or vice versa.⁵ While it is possible for either Q1a or Q1b to be added to a question-under-discussion stack containing Q1, they cannot both be added. Nonetheless, we have the clear intuition that a speaker could ask both Q1a and Q1b in order to answer Q1. Roberts captures this relationship with a STRATEGY OF INQUIRY:

- (20) For any question $q \in Q \cap Acc$, $Strat(q)$, the STRATEGY OF INQUIRY which aims at answering q , is the ordered pair $\langle q, S \rangle$, where S is the set such that, if there are no $q' \in Q$ such that $QUD(q') = \langle \dots q \rangle$, then $S = \emptyset$; otherwise, for all $q' \in Q$, $QUD(q') = \langle \dots q \rangle$ iff $Strat(q') \in S$.
 (Roberts 1996:102)

Ignoring the polar questions, the strategy of inquiry for Q1, then, is the ordered pair $\langle Q1, \{\langle Q1a, \emptyset \rangle, \langle Q1b, \emptyset \rangle\} \rangle$. That is, the strategy for answering Q1 is to add Q1a or Q1b to the question-under-discussion stack and then to answer it before adding the other question. Thus, while the subquestions of Q1 are related to Q1 by informativeness, they are only related to each other as subparts of a strategy of inquiry to answer Q1.

The questions in the question-under-discussion stack are related by their order in the discourse, and derivatively by their relative informativeness. Focus comes into the picture through a presupposition. For Roberts, a focus presupposes that the sentence is congruent to the question under discussion:

- (21) *Presupposition of prosodic focus in an utterance* β
 A move β is congruent to the question under discussion at the time of utterance.
 (Roberts 1996:116)

We can interpret prosodic focus here as a high pitch accent, or what Jackendoff (1972:261) calls Accent B. As Büring (2003) shows, contrastive topics, or what Jackendoff calls Accent A, impose different discourse constraints, though they, too, can be accommodated in the question-under-discussion framework.

⁵The problem is the same for polar questions. While a complete answer to the polar question Q1a_i does partially answer the higher constituent question Q1a, it does not serve as any sort of answer to the polar question Q1a_{ii}.

Sentences with *only* frequently occur in discourses like (22) where the answer is not congruent to the question under discussion but rather to the question *Who is it such that Mary only invited them for dinner?* How is the presupposition of focus satisfied here?

- (22) Q: Who did Mary invite for dinner?
A: Mary only invited [LYN]_F for dinner.

Like other presuppositions, the presupposition of focus can be accommodated. New questions under discussion can be added to the question-under-discussion stack even if they have not been explicitly mentioned, as long as they obey the structure of the stack, as defined in (18). In (22), while only the question *Who did Mary invite for dinner?* has been explicitly mentioned, the question-under-discussion stack actually looks like the following:

- (23) Q1: $\llbracket \text{Who did Mary invite for dinner?} \rrbracket^{\circ} = \lambda_w \lambda_p \exists x (\mathbf{p} = \mathbf{invite}(x)(\mathbf{mary}))$
Q2: $\llbracket \text{Who is it such that Mary only invited them for dinner?} \rrbracket^{\circ} = \lambda_w \lambda_p \exists x (\mathbf{p} = \lambda_w' \forall \mathbf{f} (\mathbf{f}_w(\mathbf{mary}) \rightarrow \mathbf{f} = \mathbf{invite}(x)))$
A: $\llbracket \text{Mary only invited [LYN]}_F \text{ for dinner} \rrbracket^{\circ} = \lambda_w \forall \mathbf{f} (\mathbf{f}_w(\mathbf{mary}) \rightarrow \mathbf{f} = \mathbf{invite}(\mathbf{lyn}))$

The presupposition associated with the focus in the answer is satisfied by accommodating Q2 into the stack on top of Q1. Since a complete answer to Q2 provides an answer to Q1, the stack's ordering requirement (subclause iii) is obeyed.

How does focus restrict the quantificational domain of *only*? For Roberts, this semantic interaction with focus arises from general pragmatic principles. She proposes an implementation of the maxim of Relevance—‘Be relevant!’ (Grice 1975:46)—in terms of the question under discussion:

- (24) A move m is RELEVANT to the question under discussion q iff m either introduces a partial answer to q (m is an assertion) or is part of a strategy to answer q (m is a question).
(Roberts 1996:104)

A declarative sentence is relevant just in case it partially (or totally) answers the question under discussion. Since questions do not, of course, answer anything, Relevance must be defined differently for them. A question obeys Relevance just in case it is part of a strategy to answer the question under discussion. We know that *only*'s domain must be restricted in some way.⁶ For Roberts, it is Relevance that is responsible for doing this.

Assuming that the model contains two individuals other than Mary—Lyn and Nick—we want to restrict the domain of *only* in (23) to the set of properties of inviting someone, i.e. $\{\mathbf{invite}(\mathbf{lyn}), \mathbf{invite}(\mathbf{nick})\}$. This domain restriction yields the correct truth conditions—every person that Mary invites is Lyn—and it allows the discourse to satisfy Relevance. The answer comprises a partial answer to Q2 (in fact, it is a complete answer), and Q2 can form a strategy to answer Q1 (since it is a subquestion with Q1 on the same question-under-discussion stack). But, as Beaver and Clark (2008:123–130) argue, it is not enough to derive the correct domain restriction. Roberts must also show that *only*'s domain cannot be restricted in any other way. To take one of Beaver and Clark's examples, say that *only*'s domain in (23) were restricted instead to the set of

⁶Assuming that VP-adjoined *only* universally quantifies over properties, if its domain were not restricted, the sentence would be false in any consistent model. All individuals have at least the property of self-identity, so it would not be possible for some other property to be the sole property holding of an individual.

properties of doing something to Lyn, e.g. $\{\mathbf{call}(\mathbf{lyn}), \mathbf{invite}(\mathbf{lyn})\}$. Relevance would still be satisfied. The answer, of course, comprises a partial answer to Q2. And, Q2 can form a strategy to answer Q1. A complete answer to Q2 (say, that Mary invited Lyn but that she did not call her) does, in fact, comprise a partial answer to Q1 (since we do not know who else Mary invited). Yet, there is no way that the *only* sentence in (23) means this.

On the basis of examples like these, Beaver and Clark conclude that Roberts' account, in which the relationship between *only* and the question under discussion is constrained solely by Relevance, is not restrictive enough. I will argue in the following section that this conclusion is premature, and that what we need is a better notion of Relevance. But, first, let me outline Beaver and Clark's theory of association with focus. They assume the question-under discussion framework, but they propose, unlike Roberts, that associating expressions make direct reference to the question under discussion in their lexical meaning.⁷

For Beaver and Clark, *only* has a MIRATIVE discourse function, it serves to reset expectations about the true answer to the question under discussion by conveying that it is a relatively weak answer. It does this through an at-issue entailment and a presupposition. These two meaning components are the same for both the sentences in (25):

- (25) a. Marion only [FEEDS]_F Dudley.
 b. Marion only feeds [DUDLEY]_F.

- (26) At-issue entailment: $\lambda w \forall \mathbf{p} (\mathbf{p} \in \mathbf{P}_{QUD} \wedge \mathbf{p}(w) \rightarrow \mathbf{feed}(\mathbf{dudley})(\mathbf{marion}) \geq_{\sigma} \mathbf{p})$
 Presupposition: $\lambda w \forall \mathbf{p} (\mathbf{p} \in \mathbf{P}_{QUD} \wedge \mathbf{p}(w) \rightarrow \mathbf{p} \geq_{\sigma} \mathbf{feed}(\mathbf{dudley})(\mathbf{marion}))$

Beaver and Clark take *only* to locate its prejacent on the scale (σ) created by ordering the propositions contained in the question under discussion (\mathbf{P}_{QUD}). In the simple case, this ordering is simply entailment, or informativeness. The sentences in (25) thus presuppose, as shown in (26), that all the propositions in the question under discussion are equal to or more informative than the prejacent. The at-issue entailment conveys that all the propositions in the question under discussion are equal to or less informative than the prejacent. Combined, the presupposition and the at-issue entailment in (26) are equivalent to the expression in (27), which states that all the propositions in the question under discussion are just as informative as *only*'s prejacent.

- (27) $\lambda w \forall \mathbf{p} (\mathbf{p} \in \mathbf{P}_{QUD} \wedge \mathbf{p}(w) \rightarrow \mathbf{p} =_{\sigma} \mathbf{feed}(\mathbf{dudley})(\mathbf{marion}))$

While their logical forms are the same, the two sentences in (25) have different truth conditions because they answer different questions under discussion. (25a), which has focus on the object, can only occur after the object question in (28a). In contrast, (25b), which has focus on the verb, can only occur after the question in (28b), which asks about the binary relation that holds of Marion and Dudley.

- (28) a. $\llbracket \text{Who does Marion feed?} \rrbracket^{\circ} = \{\mathbf{feed}(x)(\mathbf{marion}) \mid x \in D_e\}$
 b. $\llbracket \text{What did Marion do to Dudley?} \rrbracket^{\circ} = \{\mathbf{R}(\mathbf{dudley})(\mathbf{marion}) \mid \mathbf{R} \in D_{\langle e, \langle e, \langle s, t \rangle \rangle}\}$

For Beaver and Clark, question-answer congruence is assured by a general constraint on utterances, the Focus Principle:⁸

⁷Umbach (2004) treats adversative *but* in a similar way. Her account is susceptible to the same criticisms.

⁸Beaver and Clark state (p. 45) the Focus Principle slightly differently. They require that '[s]ome part of a declarative utterance' be congruent to the question under discussion. This qualification is meant to take care of congruence

(29) *Focus principle*

A sentence must be congruent to the question under discussion.

Since, then, *only* quantifies over the question under discussion, the two sentences in (25) have different truth conditions. The sentence in (25a), which quantifies over the propositions of the form ‘Marion fed x ’, is true just in case Marion feeds Dudley, and no one else. The sentence in (25b), which quantifies over propositions of the form ‘Marion R Dudley’, is true just in case Marion feeds, and does nothing else to, Dudley.

Beaver and Clark are successful in dealing with *only*’s semantic interaction with focus. The quantificational domain of *only*, since it is directly restricted by the question under discussion, would never allow mismatches of the type permitted by Roberts’ purely Relevance-based account. But Beaver and Clark are not able to derive *only*’s restriction on the distribution of focus. Certainly, the Focus Principle ensures, as they point out (p. 272–276), that there will be a focus SOMEWHERE in the sentence, since:

[i]f there is no such focus, then the focal meaning of the clause containing the exclusive is a singleton set, and, by the Focus Principle, the [question under discussion] which that clause answers either contains no alternatives, or just the prejacent. This should be ruled out by an independent condition on discourse, that the [question under discussion] contains multiple open alternatives.

If a sentence does not contain a focus, for Beaver and Clark, it can only be congruent to a question whose denotation is empty or only contains a single answer. But such questions should not be allowed on the question-under-discussion stack to begin with since they are not unanswered but answerable questions. Without any type of focus at all, then, an *only* sentence is infelicitous.⁹

As we saw in Chapter 2, it is not enough for there to be a focus present: there must be a focus inside the sister of *only*. Beaver and Clark allow, however, for *only* to associate with a broad focus on the entire sentence. Imagine that Oswald has been planning to submit a paper to a journal, and I want to know where he is in the submission process. The propositions in the question under discussion—that Oswald submitted the paper to the journal, that the editor sent the paper to the reviewers, that the reviewers wrote the reviews, and that the journal accepted the paper—are ordered by the sequence in which they occur. If Oswald does not submit the paper to the journal, then the journal cannot have accepted it, etc., etc. I reflect this ordering informally by listing stronger propositions above weaker ones in the denotation of the question under discussion:

between questions and answers differing in polarity. For a negative answer, the question will have to be a subset of the focus value of that part of the answer that excludes negation. Since later on I move to Groenendijk and Stokhof’s (1984) semantics for questions, this qualification, which introduces a certain measure of uncertainty into the definition, is not necessary.

⁹Beaver and Clark offer another reason for why there must always be a focus present. The presupposition in (26) has the ‘salient expectation that some stronger alternative to the prejacent holds. If there is no alternative other than the prejacent, clearly this presupposition will fail’ (p. 274). This argument does not go through, though. While one might ‘expect’ there to be an alternative stronger than the prejacent, the presupposition in (26) only requires that all the propositions in the question under discussion be equal to or greater than the prejacent. This would be satisfied even if the question under discussion only contained a single proposition, the prejacent, since it is, of course, equal in informativeness to itself. And, even if this did work for *only*, it is not clear how it would extend to other associating expressions that do not contribute the same presupposition.

$$(30) \quad Q: \quad \llbracket \text{What happened?} \rrbracket^o = \left\{ \begin{array}{l} \text{accept}(\text{the-paper})(\text{the-journal}), \\ \text{write}(\text{the-reviews})(\text{the-reviewers}), \\ \text{send}(\text{the-paper})(\text{the-reviewers})(\text{the-editor}), \\ \text{submit}(\text{the-paper})(\text{oswald}) \end{array} \right\}$$

A1: $[\text{Oswald submitted the PAPER}]_F$.

A2: $\#[\text{Oswald only submitted the PAPER}]_F$.

The plain answer in A1 is felicitous as a response to the general question *What happened?*. Beaver and Clark predict that the corresponding *only* sentence in A2 should also be felicitous. The Focus Principle is satisfied in both A1 and A2 since the answer is congruent to the question under discussion. Nonetheless, A2 is out.¹⁰ Beaver and Clark’s account fails because they do not consider the surface position of *only*. It is adjoined to the verb phrase, which must entirely contain a focus.

At this point, we might step back and reconsider why Beaver and Clark have *only* quantify directly over the question under discussion. They were attempting to fix a problem in Roberts’ account. Relying solely on Relevance, as she understood it, to restrict the domain of *only*, she predicted that, in a sentence like (31), *only* should be able to quantify over, for instance, the set of properties of doing something to Lyn.

(31) Mary only invited $[\text{LYN}]_F$ for dinner.

It is simply a fact, though, that with focus on the object, this sentence can only mean that Mary invited Lyn, and no one else. Working from very similar examples, Kadmon (2001:343–350) makes an important observation. The reason that (31) does not mean that Mary invited, and did nothing else, to Lyn is that, while this would be relevant to the question *Who did Mary invite for dinner?*, it would be OVERINFORMATIVE. With the impossible domain restriction, this sentence would also serve as a partial answer to the completely independent question *What did Mary do to Lyn?* This is a violation of the second maxim of Quantity — ‘Do not make your contribution more informative than is required’ (Grice 1975:45). The domain of *only* should be determined, as in Roberts’ original vision, by completely pragmatic considerations. It is just that Relevance, strictly speaking is not enough. *Only* quantifies over the relevant alternatives — and only the relevant alternatives. Implementing this intuition will take a bit of work, and it will require us to adopt a new semantics for questions.

¹⁰As discussed in the previous footnote, Beaver and Clark argue that the distributional restriction on focus might derive instead from *only*’s presupposition that all the propositions in the question under discussion are higher on a contextually salient scale than the prejacent. But this, too, predicts that *only* should be able to associate with a broad focus on the entire sentence. As before, because of the broad focus on the entire sentence, both A1 and A2 satisfy the Focus Principle since the denotation of the question under discussion comprises a subset of their focus alternatives. We can now look to see whether A2 runs afoul of the presupposition it conveys, which is:

$$(i) \quad \lambda w \forall \mathbf{p} (\mathbf{p} \in \mathbf{P}_{QUD} \wedge \mathbf{p}(w) \rightarrow \mathbf{p} \geq_{\sigma} \text{submit}(\text{the-paper})(\text{oswald}))$$

Since all the propositions in the question under discussion in (30) are higher on the scale provided by the context (they are stronger), this means that the presupposition is satisfied. Beaver and Clark thus predict — incorrectly — that A2 should be good.

5.4 Groenendijk and Stokhof's semantics for questions

Hamblin's (1973) semantics for questions do not count a negative declarative sentence as the answer to a positive question. This is, however, entirely possible:¹¹

- (32) Q: Who did Mary invite?
A: Mary DIDN't invite [LYN]_F.

For Hamblin, the meaning of the question in (32) is derived by making a substitution in the position of the wh-phrase. This makes, for instance, the proposition that Mary invited Lyn one of the possible answers to the question—but not the proposition that Mary did not invite Lyn.

The semantics that Groenendijk and Stokhof (1984) propose for questions do not have this shortcoming. Instead of a set of propositions, the intension of a question is a relation between possible worlds. The question in (32) thus expresses the relation in (33).

$$(33) \quad \llbracket \text{Who did Mary invite?} \rrbracket^o = \lambda w \lambda w' (\lambda x (\mathbf{invite}_w(x)(\mathbf{mary})) = \lambda x (\mathbf{invite}_{w'}(x)(\mathbf{mary})))$$

This relation holds of two worlds just in case the people that Mary invited are the same in both worlds. For a more intuitive understanding, we can think about what such a relation does to the domain it is defined on. As equivalence relations (relations that are reflexive, symmetric, and transitive), questions induce a partition on the context set. The question in (32) divides the context set into a collection of subsets of the context set such that: i) the intersection of any two of these subsets is the empty set; and ii) the union of all these subsets equals A itself. All the worlds in each cell of this partition are related by the question. They agree completely in the individuals that Mary invited. Consider how the question in (32) partitions the context set in the toy model of (34).

- (34) a. $D_e = \{\text{Lyn, Mary, Nick}\}$
b. $D_s = \{w_1, \dots, w_{16}\}$
c. $\mathbf{call}(\mathbf{lyn})(\mathbf{mary}) = \{w_1, w_2, w_3, w_4, w_6, w_7, w_8, w_{12}\}$
d. $\mathbf{call}(\mathbf{nick})(\mathbf{mary}) = \{w_1, w_2, w_3, w_5, w_6, w_9, w_{10}, w_{13}\}$
e. $\mathbf{invite}(\mathbf{lyn})(\mathbf{mary}) = \{w_1, w_2, w_4, w_5, w_7, w_9, w_{11}, w_{14}\}$
f. $\mathbf{invite}(\mathbf{nick})(\mathbf{mary}) = \{w_1, w_3, w_4, w_5, w_8, w_{10}, w_{11}, w_{15}\}$

$$(35) \quad C[(32Q)] = \begin{array}{|c|c|} \hline \mathbf{I}(\mathbf{l})(\mathbf{m}) \wedge \mathbf{I}(\mathbf{n})(\mathbf{m}) & \mathbf{I}(\mathbf{l})(\mathbf{m}) \wedge \neg \mathbf{I}(\mathbf{n})(\mathbf{m}) \\ \hline \{w_1, w_4, w_5, w_{11}\} & \{w_2, w_7, w_9, w_{14}\} \\ \hline \neg \mathbf{I}(\mathbf{l})(\mathbf{m}) \wedge \mathbf{I}(\mathbf{n})(\mathbf{m}) & \neg \mathbf{I}(\mathbf{l})(\mathbf{m}) \wedge \neg \mathbf{I}(\mathbf{n})(\mathbf{m}) \\ \hline \{w_3, w_8, w_{10}, w_{15}\} & \{w_6, w_{12}, w_{13}, w_{16}\} \\ \hline \end{array}$$

Prior to adding the question, the context set (C) contains the entire domain of worlds, D_s . Updating it with the question (notated by putting the question in square brackets) partitions it into four cells: one where Mary only invites Lyn $\{w_2, w_7, w_9, w_{14}\}$, one where she only invites Nick $\{w_3, w_8, w_{10}, w_{15}\}$, one where both are invited $\{w_1, w_4, w_5, w_{11}\}$, and finally one in which nobody is invited $\{w_6, w_{12}, w_{13}, w_{16}\}$. For each cell, all of the worlds are related to one another by the equivalence relation expressed by the question. The top left cell, for instance, contains four worlds: Is

¹¹Notice that the answer in (32) bears, in addition to a pitch accent on the subject, another pitch accent on the auxiliary. The presence of this verum focus, I assume, can be derived in a systematic fashion.

the set of individuals that Mary invites the same in all of these worlds? Yes, since w_1 , w_4 , w_5 , and w_{11} are all worlds in which she invites both Lyn and Nick.

Some of the possible answers to the question, then, are the declarative sentences that pick out each of these four cells. Each of the four cells is an exhaustive answer to the question: it says for each individual in the domain whether or not that individual makes sushi. The declarative sentence that picks out the top right cell, for instance, is *Mary invited Lyn and no one else*, which excludes Nick as an invitee. While often we do provide exhaustive answers, the clearly felicitous answer in (32) does not correspond to any of the four cells. It asserts only that Mary did not invite Lyn, it says nothing about Nick. We need a notion of answerhood that captures our intuition that this is felicitous even though it is not exhaustive. Groenendijk (1999) provides exactly this. A declarative sentence counts as an answer to a question just in case it is LICENSED:

$$(36) \quad \tau \text{ LICENSES } \phi \text{ iff } \forall C \forall w \forall w' ((\langle w, w' \rangle \in C[\tau] \wedge w \notin C[\tau][\phi] \rightarrow w' \notin C[\tau][\phi]).$$

(Groenendijk 1999:116)

Licensing prevents the elimination of one of the worlds in a cell without eliminating every other world in that cell. By defining an answer as a declarative sentence that is licensed, answers that eliminate part of one cell are ruled out.¹²

This corresponds to our notion of a coherent answer. If I followed up the question in (32) with *Mary called Nick*, I would not be addressing the issue at hand. This declarative sentence appropriately does not count as an answer to the question under discussion since it is not licensed. The proposition that Mary called Nick is true in w_1 , w_2 , w_3 , w_5 , w_6 , w_9 , w_{10} , and w_{13} . Adding it to the common ground would eliminate the complement of this set, which corresponds, if we look back at (35), to removing only parts of all four cells. It does not matter, however, how many cells a declarative sentence picks out. As long as it deals in entire cells of the partition, it can be either a complete answer or a partial one. Thus, the negative declarative sentence in (32) qualifies as a legitimate answer to the question since it eliminates two entire cells of the partition—namely, the top two, in which Mary does invite Lyn.

Licensing, by itself, counts contradictions and tautologies as legitimate answers since they eliminate, respectively, none of the cells in a partition and all of them. For this reason, Groenendijk introduces (p. 117) the notion of a PERTINENT answer, which, in addition to being licensed after a given sequence of moves τ , must be: i) CONSISTENT with τ (37); and ii) not ENTAILED by τ (38).

$$(37) \quad \phi \text{ is CONSISTENT with } \tau \text{ iff } \exists C(C[\tau][\phi] \neq \emptyset).$$

$$(38) \quad \tau \text{ ENTAILS } \phi \text{ iff } \forall C(C[\tau] = C[\tau][\phi]).$$

(Groenendijk 1999:115)

Contradictions, since they are absurd answers and reduce the context set to the empty set, do not satisfy consistency. Tautologies, since they are not informative and do not reduce the size of the context set, are not entailed by any questions.

While licensing corresponds to the Gricean maxim of Relevance—ensuring that conversational participants exclusively address the conversational issue—consistency and nonentailment are formulations of the maxims of Quality and Quantity. Consistency ensures that an answer is not contradictory, given what is already in the common ground; and, nonentailment ensures that the

¹²In inquisitive semantics (Groenendijk and Roelofsen 2009), a framework that extends results from Groenendijk's earlier (1999) work, licensing is captured in the notion of compliance (pp. 19–23).

answer is informative relative to the common ground. It is pertinence that I would like to propose constrains the relationship of questions in the question-under-discussion stack. Before implementing this, I first need to define licensing between questions, as the current definition in (36) only applies to declarative sentences. This can be done as follows:

- (39) A question τ is LICENSED after another question τ' iff, for all ϕ , if ϕ is licensed after τ , then ϕ is licensed after τ' .

By defining a version of licensing for questions, we capture our notion that questions, too, can be more or less relevant to one another. If I ask you what Hilary did this morning, you might in turn reply by asking *What did Hilary eat for breakfast?* Though you do not answer my original question, by posing another question, we make progress towards answering it. In contrast, if you reply by asking *What did Robin eat?*, I will most likely be puzzled. Your question does not help to answer my question. The definition in (39) tells us why. There are answers licensed after your question—for example, that Robin ate bagels—that are not licensed after mine.

We can now amend Roberts' original definition for the question-under-discussion stack so that the questions it contains are constrained by Groenendijk's notion of pertinence (recall that $CG(m)$ is equal to the context set C right before the common ground is updated with m):

- (40) *QUD*, the QUESTION-UNDER-DISCUSSION STACK, is a function from M (the moves in the discourse) to ordered subsets of $Q \cap Acc$ (where, for the set of questions Q and the set of accepted moves, $Q \subseteq M$ and $Acc \subseteq M$) are such that for all $m \in M$:
- i. for all $q \in Q \cap Acc$, $q \in QUD(m)$ iff
 - (a) $q < m$ (i.e. neither m nor any subsequent questions are included);
 - (b) $CG(m)[q] \neq \emptyset$; and
 - (c) $CG(m) \neq CG(m)[q]$;
 - ii. $QUD(m)$ is (totally) ordered by $<$; and
 - iii. for all $q, q' \in QUD(m)$, if $q < q'$, then q' is licensed after q .

Updating the common ground with a question, of course, does not remove any worlds. So, as required by subclause i(b), all questions are consistent, unless the common ground is contradictory so that context set is the empty set to begin with. The question-under-discussion stack is further restricted, in subclause i(c), to questions that are not entailed (they have not been answered yet). This requirement is also found in Roberts' original definition. While consistency and entailment constrain the questions that can be in the stack, licensing relates the questions it contains. By clause iii, a question that occurs higher on the stack must be licensed by the question below it. Roberts' version of this clause required that more recently introduced questions provide only partial answers to earlier questions. That is, later questions had to be less informative than earlier ones. Licensing ensures this same result by ruling out overinformative answers altogether.

5.5 Deriving the semantic effects of focus

How does this more constrained question-under-discussion framework fare with *only*'s semantic interaction with focus? Since its quantificational domain is not restricted directly by the question

under discussion, we can say that *only* quantifies over properties when it adjoins to the verb phrase. By the Focus Principle, an *only* sentence like the answer in (41) must be congruent to the immediate question under discussion, which is Q2, even though it may be only Q1 that is explicitly mentioned. Q2 induces the partition in (42) on the context set.

- (41) Q1: $\llbracket \text{Who did Mary invite for dinner?} \rrbracket =$
 $\lambda w \lambda w' (\lambda x (\mathbf{invite}_w(x)(\mathbf{mary})) = \lambda x (\mathbf{invite}_{w'}(x)(\mathbf{mary})))$
 Q2: $\llbracket \text{Who is it such that Mary only invited them for dinner?} \rrbracket =$
 $\lambda w \lambda w' (\lambda x \forall \mathbf{f} (\mathbf{f}_w(\mathbf{mary}) \rightarrow \mathbf{f} = \mathbf{invite}(x)) = \lambda x \forall \mathbf{f} (\mathbf{f}_{w'}(\mathbf{mary}) \rightarrow \mathbf{f} = \mathbf{invite}(x)))$
 A: $\llbracket \text{Mary only invited [LYN]}_F \text{ for dinner} \rrbracket = \lambda w \forall \mathbf{f} (\mathbf{f}_w(\mathbf{mary}) \rightarrow \mathbf{f} = \mathbf{invite}(\mathbf{lyn}))$

- (42) $\mathbf{f} \in \{\mathbf{invite}(\mathbf{lyn}), \mathbf{invite}(\mathbf{nick})\}$

$C[(41)Q2] =$	$\forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{l})) \wedge$ $\forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{n}))$ $\{w_6, w_{12}, w_{13}, w_{16}\}$	$\forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{l})) \wedge$ $\neg \forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{n}))$ $\{w_2, w_7, w_9, w_{14}\}$
	$\neg \forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{l})) \wedge$ $\forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{n}))$ $\{w_3, w_8, w_{10}, w_{15}\}$	$\neg \forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{l})) \wedge$ $\neg \forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{n}))$ $\{w_1, w_4, w_5, w_{11}\}$

With the domain of *only* restricted to a contextually salient subset of $\{\mathbf{invite}(x) \mid x \in D_e\}$, Q2 creates the exact same partition that Q1 does. Compare (42) to the partition created by adding Q1 in (35). Since the two partitions are identical, any declarative sentence licensed by Q2 will also be licensed by Q1. The discourse in (41) is consequently a felicitous discourse satisfying the constraints on the question-under-discussion stack. This is the domain restriction, of course, that Roberts does not have a problem deriving. She does have problems, though, with restricting *only*'s domain to just this set.

Let us look again at Beaver and Clark's example from §5.3. They ask why *only* cannot be restricted to quantifying over the set containing just the property of inviting Lyn and the property of calling Lyn. Now that the question-under-discussion stack is constrained by licensing, making *only*'s quantificational domain equal to this set no longer yields a coherent discourse:

- (43) $\mathbf{f} \in \{\mathbf{invite}(\mathbf{lyn}), \mathbf{call}(\mathbf{lyn})\}$

$C[(41)Q2] =$	$\forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{l})) \wedge$ $\forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{n}))$ $\{w_{10}, w_{13}, w_{15}, w_{16}\}$	$\forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{l})) \wedge$ $\neg \forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{n}))$ $\{w_5, w_9, w_{11}, w_{14}\}$
	$\neg \forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{l})) \wedge$ $\forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{n}))$	$\neg \forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{l})) \wedge$ $\neg \forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{n}))$ $\left\{ \begin{array}{l} w_1, w_2, w_3, w_4, \\ w_6, w_7, w_8, w_{12} \end{array} \right\}$

With this domain restriction, Q2 is not licensed after Q1, and so the two questions do not form a legitimate question-under-discussion stack. To show this, we need to find just one answer that is licensed after Q2 but is not licensed after Q1. Take, for instance, the top right cell of (43): it contains all those worlds in which, of inviting or calling Lyn, the only property true of Mary is inviting Lyn and not inviting Nick. This answer is not licensed by Q1. Adding the worlds w_5, w_9 ,

w_{11} , and w_{14} to the common ground in (35) would eliminate subparts of cells.¹³

So, while it does not seem like the original question-under-discussion account has much of a problem dealing with *only* (once the relationship of questions in the question-under-discussion stack is more tightly constrained), Beaver and Clark level another criticism against it. They wonder (p. 128) how it would account for the semantic interaction of other one-place associating expressions, such as the scalar additive *even*:

- (44) a. Mary has even [invited]_F Lyn.
 b. Mary has even invited [LYN]_F.

The quantificational component of *even*'s meaning is presuppositional. How do pragmatic principles like the maxim of Relevance act to constraint what this presupposition is? I would say that this happens in the same way it does for *only*, though its quantificational component is an at-issue entailment.

Just because the scalar component of *even*'s meaning is a presupposition does not mean it is unconstrained by such pragmatic principles as the maxim of Relevance. It, too, must be licensed after the question under discussion it presupposes. What this question will be is determined by at-issue entailment of the sentence in (44b):

- (45) Q: $\llbracket \text{Who has Mary invited?} \rrbracket =$
 $\lambda_w \lambda_{w'} (\lambda_x (\mathbf{invite}_w(x)(\mathbf{mary})) = \lambda_x (\mathbf{invite}_{w'}(x)(\mathbf{mary})))$
 A: $\llbracket \text{Mary has even invited [LYN]}_F \rrbracket =$
 At-issue: $\mathbf{invite}(\mathbf{lyn})(\mathbf{mary})$
 Presupposition: $\lambda_w \exists \mathbf{f} (\mathbf{f} \neq \mathbf{invite}(\mathbf{lyn}) \wedge \mathbf{invite}_w(\mathbf{lyn})(\mathbf{mary}) \rightarrow \mathbf{f}_w(\mathbf{mary}))$

Unlike *only*, *even* does not presuppose a question that contains *even* itself. The quantifier whose domain is restricted is part of the presupposition. Since *even* adjoins to VP, this is existential quantification over properties. And, with focus on the object in (45), it is quantification over properties of inviting someone. The goal now is to get the presupposition in (45) restricted to quantifying over this set and no other.

Assuming the model in (34), the question in (45) imposes the following partition:

$$(46) \quad C[(45Q)] = \begin{array}{|c|c|} \hline \mathbf{I}(\mathbf{l})(\mathbf{m}) \wedge \mathbf{I}(\mathbf{n})(\mathbf{m}) & \mathbf{I}(\mathbf{l})(\mathbf{m}) \wedge \neg \mathbf{I}(\mathbf{n})(\mathbf{m}) \\ \hline \{w_1, w_4, w_5, w_{11}\} & \{w_2, w_7, w_9, w_{14}\} \\ \hline \neg \mathbf{I}(\mathbf{l})(\mathbf{m}) \wedge \mathbf{I}(\mathbf{n})(\mathbf{m}) & \neg \mathbf{I}(\mathbf{l})(\mathbf{m}) \wedge \neg \mathbf{I}(\mathbf{n})(\mathbf{m}) \\ \hline \{w_3, w_8, w_{10}, w_{15}\} & \{w_6, w_{12}, w_{13}, w_{16}\} \\ \hline \end{array}$$

Suppose that *even* quantifies over the set of properties of inviting someone, i.e. $\{\mathbf{invite}(\mathbf{lyn}), \mathbf{invite}(\mathbf{nick})\}$. The presupposition of the answer in (45) picks out the set of worlds $w_1, w_3, w_4, w_5, w_6, w_8, w_{10}, w_{11}, w_{12}, w_{13}, w_{15}$, and w_{16} . This corresponds to exactly three of the cells in the partition, the top left one and the bottom two, and so with this domain restriction the presupposition is licensed. Say, instead, that *even* were restricted to a different set, that of doing

¹³This partition is skewed because the question asks about who Mary invited (it ranges over the individuals Lyn and Nick), but the domain of *only* contains just properties that make reference to Lyn. For this reason, the proposition $\forall \mathbf{f} (\mathbf{f}(\mathbf{m}) \rightarrow \mathbf{f} = \mathbf{I}(\mathbf{n}))$ is always false except for when none of the contextually salient properties holds of Mary, and it is vacuously true. Thus, the bottom left cell is empty.

something to Lyn, i.e. $\mathbf{f} \in \{\mathbf{invite}(\mathbf{lyn}), \mathbf{call}(\mathbf{lyn})\}$. Then, the presupposition would pick out a different set of worlds: $w_1, w_2, w_3, w_4, w_6, w_7, w_8, w_{10}, w_{12}, w_{13}, w_{15}$, and w_{16} . This proposition is not licensed after the question in (45) since it removes parts of cells in the partition. For instance, w_2 and w_7 in the top right cell.

Licensing rules out answers that are irrelevant by providing more information than is strictly required by the question under discussion. It does, however, seem possible, at least some times, to answer a question and give more information than is asked for. Take, for instance, the following:

- (47) A: What state does Susan live in?
 B: She lives in Los Angeles.

B gives an overinformative answer that is not licensed. It does not correspond to any of the cells in the partition created by the question. While I do not doubt that such discourses occur, they are clearly not normative. I could imagine A replying in surprise: *But Los Angeles isn't a state!* We can see that a conversational norm is being violated here since it can be exploited by speakers to renegotiate shared conversational goals. Imagine that A is trying to figure out whether Susan has a car and drives a lot. Thinking that Susan's state of residence might tell her something, she inquires as in (47). By answering in the way she does, B proposes to replace that question with one that she thinks is relevant to resolving a higher domain goal, namely *What city does Susan live in?*. Her answer IS licensed after this question, and to B's mind is the relevant question to be asking.

The semantic interaction of *only* and *even* with focus falls out from general pragmatic principles—namely Relevance—that structure discourse. In the next section, I show how these principles, through their interaction with the syntax and semantics of associating expressions, give rise to the distributional restriction on focus.

5.6 The adversatives' distributional restriction on focus

We are trying to account for the contrast in (48). The two sisters of adversative *but* must each contain a focus, or else the sentence is infelicitous.

- (48) a. Not [MAX]_F but [NICK]_F made sushi.
 b. #Not Max but Nick made [Sushi]_F.

I propose that (48b) is infelicitous since, with this focus structure, there is no question under discussion to which both conjuncts of the adversative *but* sentence are relevant answers. Consider, for instance, the question in (49).

- (49) $\llbracket \text{Who made sushi?} \rrbracket = \lambda_w \lambda_{w'} (\lambda_x (\mathbf{make}_w \mathbf{sushi})(x)) = \lambda_x (\mathbf{make}_{w'} \mathbf{sushi})(x))$

With the toy model in (50), this question creates the four-way partition in (51).

- (50) a. $D_e = \{\text{Max, Nick, sushi, tandori}\}$
 b. $D_s = \{w_1, \dots, w_{16}\}$
 c. $\text{make}(\text{sushi})(\text{max}) = \{w_1, w_2, w_3, w_4, w_6, w_7, w_8, w_{12}\}$
 d. $\text{make}(\text{sushi})(\text{nick}) = \{w_1, w_2, w_3, w_5, w_6, w_9, w_{10}, w_{13}\}$
 e. $\text{make}(\text{tandori})(\text{max}) = \{w_1, w_2, w_4, w_5, w_7, w_9, w_{11}, w_{14}\}$
 f. $\text{make}(\text{tandori})(\text{nick}) = \{w_1, w_3, w_4, w_5, w_8, w_{10}, w_{11}, w_{15}\}$

(51) $C[(49)] =$

$\mathbf{M(s)(m)} \wedge \mathbf{M(s)(n)}$ $\{w_1, w_2, w_3, w_6\}$	$\mathbf{M(s)(m)} \wedge \neg \mathbf{M(s)(n)}$ $\{w_4, w_7, w_8, w_{12}\}$
$\neg \mathbf{M(s)(m)} \wedge \mathbf{M(s)(n)}$ $\{w_5, w_9, w_{10}, w_{13}\}$	$\neg \mathbf{M(s)(m)} \wedge \neg \mathbf{M(s)(n)}$ $\{w_{11}, w_{14}, w_{15}, w_{16}\}$

Both of the conjuncts of (48a) are licensed after this question. The first conjunct—that Max doesn't make sushi—picks out worlds $w_5, w_9, w_{10}, w_{11}, w_{13}, w_{14}, w_{15}$, and w_{16} , a set that corresponds to the bottom two cells. The second conjunct—that Nick makes sushi—picks out worlds $w_1, w_2, w_3, w_5, w_6, w_9, w_{10}$, and w_{13} , which correspond to the left-hand cells. Finally, since the *wh*-phrase of this question occurs in subject position, it is congruent to (48a), which has a focus on the two subject DP sisters of adversative *but*.

In (48b), however, focus occurs on the direct object. The sentence is accordingly infelicitous since each conjunct can only be congruent to a different question under discussion. The first conjunct is congruent to the question *What did Max make?*, while the second conjunct is congruent to the question *What did Nick make?*:

- (52) a. $\llbracket \text{What did Max make?} \rrbracket = \lambda w \lambda w' (\lambda x (\text{make}_w(x)(\text{max})) = \lambda x (\text{make}_{w'}(x)(\text{max})))$
 b. $\llbracket \text{What did Nick make?} \rrbracket = \lambda w \lambda w' (\lambda x (\text{make}_w(x)(\text{nick})) = \lambda x (\text{make}_{w'}(x)(\text{nick})))$

These two questions cannot even be contained on the same question-under-discussion stack since neither is licensed after the other. With the model in (50), updating the common ground with the questions in (52a) and (52b) would produce the partitions in (53a) and (53b) respectively.

(53) a. $C[(52a)] =$

$\mathbf{M(s)(m)} \wedge \mathbf{M(t)(m)}$ $\{w_1, w_2, w_4, w_7\}$	$\mathbf{M(s)(m)} \wedge \neg \mathbf{M(t)(m)}$ $\{w_3, w_6, w_8, w_{12}\}$
$\neg \mathbf{M(s)(m)} \wedge \mathbf{M(t)(m)}$ $\{w_5, w_9, w_{11}, w_{14}\}$	$\neg \mathbf{M(s)(m)} \wedge \neg \mathbf{M(t)(m)}$ $\{w_{10}, w_{13}, w_{15}, w_{16}\}$

b. $C[(52b)] =$

$\mathbf{M(s)(n)} \wedge \mathbf{M(t)(n)}$ $\{w_1, w_3, w_5, w_{11}\}$	$\mathbf{M(s)(n)} \wedge \neg \mathbf{M(t)(n)}$ $\{w_2, w_6, w_9, w_{13}\}$
$\neg \mathbf{M(s)(n)} \wedge \mathbf{M(t)(n)}$ $\{w_4, w_8, w_{11}, w_{15}\}$	$\neg \mathbf{M(s)(n)} \wedge \neg \mathbf{M(t)(n)}$ $\{w_7, w_{12}, w_{14}, w_{16}\}$

The question in (52a) does not license the question in (52b) since there is an answer to the former, say the top left cell, that picks out only parts of cells in the partition of the latter. Similarly, the question in (52b) does not license (52a).

The distributional restriction on focus arises for adversative *but* since, when its sisters do not each contain a focus, there is no single question under discussion to which both conjuncts are coherent answers AND congruent. The obligatoriness of the focus associated with *only* arises for much the same reason:

- (54) a. Only [MAX]_F has made sushi.
 b. # Only Max has made [SUSHI]_F.

While *only* does not describe two alternatives, it does, however, quantify over a set of alternatives, and this gives rise to the contrast in (54). The felicitous sentence in (54a) is both licensed after and congruent to the question in (55). This question establishes the partition on the context set in (56).

- (55) $\llbracket \text{Who is such that only they have made sushi?} \rrbracket =$
 $\lambda w \lambda w' (\lambda x \forall y (\mathbf{make}_w(\mathbf{sushi})(y) \rightarrow y = x) = \lambda x \forall y (\mathbf{make}_{w'}(\mathbf{sushi})(y) \rightarrow y = x))$

- (56) $x \in \{\text{Max, Nick}\}$

$$C[(55)] = \begin{array}{|c|c|} \hline \forall x(\mathbf{M}(\mathbf{s})(x) \rightarrow x = \mathbf{m}) \wedge \\ \forall x(\mathbf{M}(\mathbf{s})(x) \rightarrow x = \mathbf{n}) \\ \{w_{11}, w_{14}, w_{15}, w_{16}\} \\ \hline \neg \forall x(\mathbf{M}(\mathbf{s})(x) \rightarrow x = \mathbf{m}) \wedge \\ \forall x(\mathbf{M}(\mathbf{s})(x) \rightarrow x = \mathbf{n}) \\ \{w_5, w_9, w_{10}, w_{13}\} \\ \hline \forall x(\mathbf{M}(\mathbf{s})(x) \rightarrow x = \mathbf{m}) \wedge \\ \neg \forall x(\mathbf{M}(\mathbf{s})(x) \rightarrow x = \mathbf{n}) \\ \{w_4, w_7, w_8, w_{12}\} \\ \hline \neg \forall x(\mathbf{M}(\mathbf{s})(x) \rightarrow x = \mathbf{m}) \wedge \\ \neg \forall x(\mathbf{M}(\mathbf{s})(x) \rightarrow x = \mathbf{n}) \\ \{w_1, w_2, w_3, w_6\} \\ \hline \end{array}$$

Both the at-issue component of (54a) and its prejacent are licensed after the question in (55). The at-issue component is true just in case, if Max makes sushi, nobody else makes sushi—that is, in worlds $w_4, w_7, w_8, w_{11}, w_{12}, w_{14}, w_{15},$ and w_{16} . This corresponds to the top two cells of the partition in (56). The prejacent is true just in case Max makes sushi. This is true in worlds $w_1, w_2, w_3, w_4, w_6, w_7, w_8,$ and w_{12} , a set that is equal to the union of the two right cells.

The focus structure in (54b) is infelicitous since the question under discussion the at-issue entailment is congruent to does not license the prejacent. The sentence in (54b) is congruent to the object wh-question in (57). This creates the partition in (58).

- (57) $\llbracket \text{What has only Max made?} \rrbracket =$
 $\lambda w \lambda w' (\lambda x \forall y (\mathbf{make}_w(x)(y) \rightarrow y = \mathbf{max}) = \lambda x \forall y (\mathbf{make}_{w'}(x)(y) \rightarrow y = \mathbf{max}))$

- (58) $x \in \{\text{Max, Nick}\}$

$$C[(57)] = \begin{array}{|c|c|} \hline \forall x(\mathbf{M}(\mathbf{s})(x) \rightarrow x = \mathbf{m}) \wedge \\ \forall x(\mathbf{M}(\mathbf{t})(x) \rightarrow x = \mathbf{m}) \\ \{w_7, w_{12}, w_{14}, w_{16}\} \\ \hline \neg \forall x(\mathbf{M}(\mathbf{s})(x) \rightarrow x = \mathbf{m}) \wedge \\ \forall x(\mathbf{M}(\mathbf{t})(x) \rightarrow x = \mathbf{m}) \\ \{w_2, w_6, w_9, w_{13}\} \\ \hline \forall x(\mathbf{M}(\mathbf{s})(x) \rightarrow x = \mathbf{m}) \wedge \\ \neg \forall x(\mathbf{M}(\mathbf{t})(x) \rightarrow x = \mathbf{m}) \\ \{w_4, w_8, w_{11}, w_{15}\} \\ \hline \neg \forall x(\mathbf{M}(\mathbf{s})(x) \rightarrow x = \mathbf{m}) \wedge \\ \neg \forall x(\mathbf{M}(\mathbf{t})(x) \rightarrow x = \mathbf{m}) \\ \{w_1, w_3, w_5, w_{10}\} \\ \hline \end{array}$$

The at-issue entailment is true just in case, if Max makes sushi, nobody else makes sushi. This is true, as we saw above, in $w_4, w_7, w_8, w_{11}, w_{12}, w_{14}, w_{15},$ and w_{16} , a set of worlds that corresponds to the two top cells of the partition in (58). The prejacent, which is true in $w_1, w_2, w_3, w_4, w_6, w_7, w_8,$ and w_{12} is not licensed after this question, since it picks out parts of cells in the partition, e.g. w_7 and w_{12} of the top left cell. Since there is no question under discussion that licenses both components of *only*'s meaning, the sentence in (54b) is infelicitous.¹⁴

¹⁴Even assuming that *only* has a weaker existential presupposition (Horn 2001, Geurts and van der Sandt 2004), this is still not licensed after the question in (57). The proposition that there is something that Max made is true in worlds $w_1, w_2, w_3, w_4, w_5, w_6, w_7, w_8, w_9, w_{11}, w_{12},$ and w_{14} . This set does not correspond to the union of any of the cells in (58).

5.7 The scalar additives' distributional restriction on focus

Turning now to the scalar additives, we can take a similar approach, considering *let alone* first, then its one-place counterpart. The contrast we are trying to account for is the following one:

- (59) a. The [Democrats]_F let alone [the rePUBLICans]_F won't reform healthcare.
 b. # The Democrats let alone the Republicans won't reform [HEALTHcare]_F.

The sentence in (59a) is felicitous since there is a question under discussion it is both licensed after and congruent to, namely the one in (60).

- (60) $\llbracket \text{Who won't reform healthcare?} \rrbracket =$
 $\lambda w \lambda w' (\lambda x (\neg \text{reform}_w(\text{healthcare})(x)) = \lambda x (\neg \text{reform}_{w'}(\text{healthcare})(x)))$

Assuming the model in (61), the question in (60) induces the partition on the context set in (62).

- (61) a. $D_e = \{\text{the Democrats, the Republicans, healthcare, the military}\}$
 b. $D_s = \{w_1, \dots, w_{16}\}$
 c. $\text{reform}(\text{healthcare})(\text{the-democrats}) = \{w_1, w_2, w_3, w_4, w_6, w_7, w_8, w_{12}\}$
 d. $\text{reform}(\text{healthcare})(\text{the-republicans}) = \{w_1, w_2, w_3, w_5, w_6, w_9, w_{10}, w_{13}\}$
 e. $\text{reform}(\text{the-military})(\text{the-democrats}) = \{w_1, w_2, w_4, w_5, w_7, w_9, w_{11}, w_{14}\}$
 f. $\text{reform}(\text{the-military})(\text{the-republicans}) = \{w_1, w_3, w_4, w_5, w_8, w_{10}, w_{11}, w_{15}\}$

(62) $C[(60)] =$

$\mathbf{R}(\mathbf{h})(\mathbf{d}) \wedge \mathbf{R}(\mathbf{h})(\mathbf{r})$ $\{w_1, w_2, w_3, w_6\}$	$\mathbf{R}(\mathbf{h})(\mathbf{d}) \wedge \neg \mathbf{R}(\mathbf{h})(\mathbf{r})$ $\{w_4, w_7, w_8, w_{12}\}$
$\neg \mathbf{R}(\mathbf{h})(\mathbf{d}) \wedge \mathbf{R}(\mathbf{h})(\mathbf{r})$ $\{w_5, w_9, w_{10}, w_{13}\}$	$\neg \mathbf{R}(\mathbf{h})(\mathbf{d}) \wedge \neg \mathbf{R}(\mathbf{h})(\mathbf{r})$ $\{w_{11}, w_{14}, w_{15}, w_{16}\}$

The at-issue meaning of the *let alone* sentence in (59a) is the proposition that the Democrats will not reform healthcare. This is obviously licensed after the question in (60). The presupposition, too, is licensed as it picks out the worlds $w_1, w_2, w_3, w_4, w_6, w_7, w_8, w_{11}, w_{12}, w_{14}, w_{15}$, and w_{16} . This corresponds to three entire cells of the partition. Since the wh-phrase is in subject position, it is congruent to the answer, which has a focus on each of the subject DP sisters of *let alone*.

The sentence in (59b) is infelicitous since there is no single question under discussion that licenses both the at-issue and presupposition of *let alone*. With focus on the object, the at-issue entailment would certainly be congruent to the question in (63), but this question does not license the presupposition. Consider how it partitions the context set in (64).

- (63) $\llbracket \text{What won't the Democrats reform?} \rrbracket =$
 $\lambda w \lambda w' (\lambda x (\neg \text{reform}_w(x)(\text{the-democrats})) = \lambda x (\neg \text{reform}_{w'}(x)(\text{the-democrats})))$

(64) $C[(63)] =$

$\mathbf{R}(\mathbf{h})(\mathbf{d}) \wedge \mathbf{R}(\mathbf{m})(\mathbf{d})$ $\{w_1, w_2, w_4, w_7\}$	$\mathbf{R}(\mathbf{h})(\mathbf{d}) \wedge \neg \mathbf{R}(\mathbf{m})(\mathbf{d})$ $\{w_3, w_6, w_8, w_{12}\}$
$\neg \mathbf{R}(\mathbf{h})(\mathbf{d}) \wedge \mathbf{R}(\mathbf{m})(\mathbf{d})$ $\{w_5, w_9, w_{11}, w_{14}\}$	$\neg \mathbf{R}(\mathbf{h})(\mathbf{d}) \wedge \neg \mathbf{R}(\mathbf{m})(\mathbf{d})$ $\{w_{10}, w_{13}, w_{15}, w_{16}\}$

While the at-issue entailment—that the Democrats will not reform healthcare—is licensed, the presupposition is not. It picks out worlds $w_1, w_2, w_3, w_4, w_6, w_7, w_8, w_{11}, w_{12}, w_{14}, w_{15}$, and w_{16} . This removes parts of cells, e.g. w_5 and w_9 in the bottom left corner. Since there is no question that licenses both components of *let alone*'s meaning—that would also be congruent to the sentence in (59b) with object focus—it is infelicitous.

By now, it should be clear how the contrast between the *even* sentences in (65) is to be explained. Only when focus occurs inside the subject DP sister of *even*, as in (65), is the sentence congruent to the question under discussion AND both meaning components of *even* are licensed.

- (65) a. Even [the DEMocrats]_F didn't reform healthcare.
 b. # Even the Democrats didn't reform [HEALTHcare]_F.

The felicitous *even* sentence in (65) would be congruent to the following subject question:

- (66) [[Who didn't reform healthcare?]] =
 $\lambda w \lambda w' (\lambda x (\neg \mathbf{reform}_w(\mathbf{healthcare})(x)) = \lambda x (\neg \mathbf{reform}_{w'}(\mathbf{healthcare})(x)))$

This question induces the same partition on the context set as (62). The at-issue entailment is, of course, licensed after this question, but so too is the presupposition. With the domain of the existential quantifier restricted to the domain of individuals, the presupposition of (65a) is true in the following worlds: $w_1, w_2, w_3, w_4, w_6, w_7, w_8, w_{11}, w_{12}, w_{14}, w_{15}$, and w_{16} . This set corresponds to the union of the top two cells and bottom right cell.

The infelicitous *even* sentence can only be congruent to a different question under discussion, namely the object wh-question in (67).

- (67) [[What didn't the Democrats reform?]] =
 $\lambda w \lambda w' (\lambda x (\neg \mathbf{reform}_w(x)(\mathbf{the-democrats})) = \lambda x (\neg \mathbf{reform}_{w'}(x)(\mathbf{the-democrats})))$

This object question creates the same partition as in (64). The at-issue entailment of (65b)—that the Democrats will not reform healthcare—is licensed after this question. It is true in worlds $w_5, w_9, w_{10}, w_{11}, w_{13}, w_{14}, w_{15}$, and w_{16} , which correspond to the bottom two cells of the partition. The presupposition of (67b) is not licensed, however. It picks out the following set of worlds: $w_1, w_2, w_3, w_4, w_6, w_7, w_8, w_{11}, w_{12}, w_{14}, w_{15}$, and w_{16} . This only eliminates, for instance, w_5 and w_9 from the lower left cell.

We have now achieved our objective: we know why there must always be a focus inside each of an associating expression's sisters. Since associating expressions evoke multiple alternatives, the question under discussion must always ask about these alternatives' shared material. This is the subpart of the sentence that corresponds to the associating expression's argument or arguments.

5.8 Getting focus smaller

When the associating expressions' argument or arguments are not very big, there is not much more to say. But when they are a bit larger, it is possible for the focus to extend over a proper subpart of each argument. Then, we need to account for why it is possible to locate a pitch accent in some places but not others:

- (68) Q: What did Morgan do?
 A1: Morgan didn't [MAKE sushi]_F but [EAT sushi]_F.
 A1: #Morgan didn't [make SUSHi]_F but [eat SUSHi]_F.
- (69) Q: What will the Democrats do?
 A1: The Democrats won't [reFORM healthcare]_F let alone [eLIminate healthcare]_F.
 A2: #The Democrats won't [reform HEALTHcare]_F let alone [eliminate HEALTHcare]_F.

When the entire verb phrase is in focus, the nuclear pitch accent of the sentences in (68) and (69) can only occur on the main verb, as in the first answers. Placing it, as in the second answers, on the object is infelicitous. Note that the A1 sentences could be parsed with a different focus structure, one where there is a narrow focus on just the main verbs (as after the questions *What did Morgan do to sushi?* or *What will the Democrats do to healthcare?*). This focus structure does raise any problems.

Crucially, the difference between the first and second answers of (68–69) is a difference in intonational structure—not in focus structure. The second answers are infelicitous because of how pitch accents are assigned to a focus when that focus occurs in a contrastive structure of this type. The most famous example of contrastive focus is Rooth's (1992) two farmers example:

- (70) a. [An AMERICAN farmer]_F was talking to [a CANADIAN farmer]_F. (Rooth 1992:80)
 b. # [An American FARMer]_F was talking to [a Canadian FARMer]_F.

The subject and object DPs in this example share a common form—they are both DPs of the form 'a *f* farmer', where *f* is some property. Even though this sentence can be used in response to a question like *Who was talking to who?*, pitch accents can only be located on the adjectives (70a). Pitch accents on the head nouns are not possible (70b). Such examples pose a problem for traditional views of pitch accent assignment, such as Selkirk's (1984, 1995) projection theory, which derive the location of pitch accents solely from the hierarchical structure of an expression and a set of rules that make reference to these structures. In Selkirk's system, we would expect, in both the subject and object DPs of (70), for there to be a pitch accent on the head noun, since it is a pitch accent on the head of a phrase that allows it to be in focus.¹⁵ In other words, we would expect the sentence in (70a) to have the same intonational contour as:

- (71) [The American PRESident]_F was talking to [the Canadian Prime MINister]_F.

The difference with (70a), of course, is that, in (71), there is no overlap in the content of the subject and object DPs. They differ both in the identity of the head noun and the modifying adjective.

The problem is that, in contrastive structures, we need to look at more than just the question under discussion in order to figure out where pitch accents are going to go in a sentence. In particular, we need to compare the contrasting phrases to ONE ANOTHER, with only the material that is not shared between them having the potential to bear a pitch accent. I am not able, within the confines of this work, to offer a theory of pitch accent assignment that covers both contrastive and noncontrastive foci, though there seems, to me, two main ways of dealing with the problem. On the one

¹⁵Even Schwarzschild's (1999) theory, which relies on a givenness constraint, makes the wrong prediction. His account would lead us to expect a pitch accent on the adjective only in the object DP. Since the subject DP is not preceded by a DP of the same form, it should be possible for a pitch accent to occur on the head noun.

hand, we could attribute the unexpected intonation of contrastive structures to some independent principle. This is the tack suggested by Rooth (1992), Truckenbrodt (1995), van Deemter (1999), Féry and Samek-Lodovici (2006), and Roberts (2008). On the other hand, we could abandon any distinction between contrastive and noncontrastive focus and attempt to derive the distribution of all pitch accents from some completely general schema, as Büring (2006) does.¹⁶

Returning now to (68–69), the reason the object DPs in these examples are not able to bear pitch accents is the same as why *farmer* cannot in (70). The two VP coordinates of adversative *but* and *let alone* are standing in a contrastive relationship to one another, and therefore any material they have in common cannot bear a pitch accent. Since these VPs differ only in the identity of the main verb—the object DP *sushi* is shared in (68), as is the object DP *healthcare* in (69)—the pitch accent corresponding to focus on the entire VP can only occur on the main verb. Crucially, this effect is not confined to contrasting phrases contained within the same sentence, nor solely to two-place associating expressions. In fact, one-place associating expressions show it even more spectacularly since their meaning depends on the position of focus. In the following example, A asks what cars John drove before, so that in B’s answer, we know there is a focus on the entire DP object:

(72) John’s aunt Mary is wealthy and has lots of cars, so she often lets him drive one. Now that he’s turned 21, sometimes John drives Mary’s mini and other times he drives her red convertible.

A: What did he drive before?

B: He only drove [her BLUE convertible]_F. (Roberts 2008:2)

Since the question under discussion asks about the entire set of Mary’s cars, we understand B to mean that John drove the blue convertible and no other car. This excludes both the mini and the red convertible. Yet, the pitch accent of this phrase occurs—not on the head noun *convertible*, where it normally occurs when the entire DP is in focus—but on the modifying adjective *blue*. Presumably, this is because the phrase *her blue convertible* stands in a contrastive relationship with the parallel phrase *her red convertible* in the preceding discourse.

5.9 Summary

The distributional restriction on focus arises from the interaction of associating expressions with the question under discussion. Since they are crosscategorical in their syntax, they can take a sub-constituent of the sentence as their argument or arguments. Since they also evoke multiple propositional alternatives, these alternatives will necessarily share parts of their logical form. They will, in fact, be identical in everything but the associating expression’s argument or arguments. With Groenendijk’s stricter notion of Relevance, sentences containing an associating expression can only coherently answer a restricted set of questions under discussion, those that ask about the associating expression’s argument or arguments. Question-answer congruence does the rest. There must be a focus that correlates with the *wh*-phrase of the question under discussion. Thus, there will always be a focus inside each of an associating expression’s arguments.

¹⁶There is another possibility, suggested by Büring (p. 333f.). We could generalize the rules for pitch accent assignment from contrastive structures to all other types of focus. I see no reason to pursue this option.

The semantic interaction with focus arises, as in Roberts' account, independently. Quantification happens over elements that are relevant. Since the maxim of Relevance holds generally, similar semantic effects should show up in other quantificational structures. As Partee (1991) documents, that is exactly what we find. Adverbs of quantification like *always* (Rooth 1985:164–209), modals (Halliday 1967a:38), generics (Sgall et al. 1986:62), reason statements and conditionals (Dretske 1972), superlatives (Jackendoff 1972:253f.), and quantificational determiners like *every* (Krifka 1990:511–515) all show the same semantic interaction with focus that *only* does.¹⁷

To illustrate, take the adverbs *always*, which, simplifying a bit, quantifies over events. (Lewis (1975), of course, argues for an analysis using unselective quantifiers, and von Stechow (1994:23–27) for one involving situations.) None of the sentences in (73) says that ALL events are events in which Marion feeds Dudley.

- (73) a. [MARion]_F always feeds Dudley.
 ‘If someone always feeds Dudley, Marion feeds him.’
 b. Marion always [FEEDS]_F Dudley.
 ‘If Marion always does something to Dudley, she feeds him.’
 c. Marion always feeds [DUDley]_F.
 ‘If Marion always feeds someone, she feeds Dudley.’

Rather, (73a) says that whenever someone feeds Dudley, Marion does it. (73c) says that whenever Marion does something to Dudley, it is feed him. And, (73b) says that whenever Marion feeds someone, she feeds Dudley. This is a truth-conditional difference since, if whenever I am away Marion takes care of my dogs Dudley and Daisy by feeding them (but not taking them for a walk), (73a) and (73b) would be true while (73c) would be false. If, in an alternate scenario, she takes my dogs for a walk in addition to feeding them, then (73a) and (73c) would be true while (73b) would be false.

Adverbs of quantification do not restrict the distribution of focus. In (73), focus occurs on the subject, main verb, and object. In the theory of association with focus I have proposed here, this is expected since it has neither property characterizing associating expressions. *Always* is not crosscategorical. It is pretty firmly adjoined to the verb phrase and takes a predicate of events as its argument:

- (74) a. # Always [MARion]_F feeds Dudley.
 b. # Marion feeds always [DUDley]_F.

¹⁷Negation should not be included here. Jackendoff observes (p. 254) that negation often ‘does not seem to apply to an entire sentence, but only part of it’ — namely, the focused part. In (i), the speaker seems to deny only that it was the judge that Max killed with a silver hammer — not that Max killed someone with a silver hammer. Similarly, in (ii), the speaker seems to deny that the instrument Max used to kill the judge was a silver hammer. That Max killed the judge with something does not seem to be in question.

- (i) Max didn't kill [the JUDGE]_F with a silver hammer.
 (ii) Max didn't kill the judge with [a silver HAMMER]_F.

Kadmon (2001:259) shows, however, that focus does not affect the actual truth conditions of a negated sentence. The sentences in (i) and (ii) are true in exactly the same situations — those in which it is not the case that Max killed the judge with a silver hammer. The difference between negation and quantificational elements is captured in Beaver and Clark's distinction (pp. 44–68) between quasiassociation and free association.

Even if *always* were crosscategorical, it still would not evoke multiple propositional alternatives. It only has an at-issue entailment that conveys universal quantification over events. (73a), for instance, describes one proposition—that Marion always feeds Dudley.

By giving *only* and *even*'s distributional restriction on focus a distinct source from their semantic interaction with focus, we seem to make the right cut. Some expressions, like the two-place associating expressions, share just the first property, while a variety of quantificational structures have just the second.

Chapter 6

Conclusion

6.1 A look back

The perspective on association with focus I have offered here is quite different from the usual one. While most of the literature deals with *only* and *even*'s semantic interaction with focus, I looked at how they restrict the distribution of focus. There must be a focus somewhere inside the associating expression's sister. As I showed in Chapter 2, this is a property that *only* and *even* share with two-place association expressions — expressions, such as adversative *but* and *let alone*, that have two sisters, and therefore require the presence of two foci.

Why is it just these expressions that associate with focus? The answer I gave in Chapter 5 was that two independent properties of these expressions interact with the question under discussion to restrict the possible placement of focus:

- *Crosscategoriality*
The associating expression can take subparts of the sentence as its argument.
- *Multiple alternatives*
The associating expression evokes more than one alternative.

Associating expressions restrict the range of questions a sentence can coherently answer, thereby restricting, indirectly, the distribution of focus. Adversative *but* and *let alone* show this interaction particularly clearly since, as I discussed in Chapters 3 and 4, they describe two propositional alternatives. *Only* and *even* only describe one alternative, though they quantify over a set of distinct alternatives.

Throughout this investigation, I have presupposed a certain conception of focus. Focus has been an abstract property of natural language expressions that constrains the discourses they can appear in. The question under discussion must ask about that part of the answer that is in focus. This is in keeping, I believe, with the spirit of Halliday (1967b). His work, however, has influenced, to some degree, most current work on focus, of which there are three main strands of research. As I explore below, they approach many of the same phenomena from different perspectives, with different questions and concerns, and so come up with different solutions and formalisms. The task for the future, as I see it, is to connect them.

6.2 Semantic theories

I start with semantic theories of focus since they have been most concerned with association with focus. As we saw, the dominant theory of focus within this tradition has been Rooth's (1985, 1992) alternative semantics in which information about focus is represented model theoretically, in a dimension of meaning that coexists with the ordinary one. These focus meanings consist of sets of alternatives to the focused element, and they can enter into the calculation of the meaning of sentences containing *only*, either directly or indirectly. In the structured meanings approach—which also captures information about the position of focus model theoretically, but through a partition of focused from background material—alternatives, too, are necessary. As Krifka (1992a:19) observes, for the domain of *only*, there must be '[a] limitation to comparable entities [that] is meant to capture contextual and ontological restrictions.' Alternatives are clearly a fundamental part of association with focus. But what are they?

Along with Roberts (1996) and Beaver and Clark (2008), my answer has been different from that of Rooth. The alternatives evoked by associating expressions come from the context, specifically from the question under discussion. *Only* does not make reference to Roothian focus meanings—sets of alternatives—and they play no role in restricting its domain. And the distributional restriction on focus, I have argued, arises through the interaction of independent properties of associating expressions with the question under discussion. Focus meanings, again, play no role. If focus meanings are no longer needed to get the truth conditions for *only* right—their original motivation—why keep them around? In the end, this is an empirical question, since focus meanings might be used for something else. Beck (2006) and Cable (2007), for instance, use them to derive intervention effects, and the compositional mechanism by which focus meanings are derived bears a striking resemblance to that used by Chierchia (2004, 2006) to derive scalar conversational implicatures.

But while, in discourse-oriented theories, the role of focus meanings in the grammar is limited—since lexical items never make reference to these model-theoretic objects—Rooth's alternative semantics are used as a tool for calculating question-answer congruence. Both Roberts and Beaver and Clark use focus meanings to ascertain whether a given declarative sentence is or is not congruent to a given question. If we got rid of focus meanings altogether, we would have no formally rigorous way of defining congruence. As we move farther along the path from a semantic theory of focus towards a (dynamic) discourse-oriented theory, perhaps an equally satisfying method of calculating question-answer congruence will appear. There are promising signs that something like this is possible in the inquisitive semantics framework (see, for instance, Balogh 2009).

6.3 Syntactic theories

I have not been concerned with focus as it is discussed in the generative syntax literature. Mostly this is because syntacticians are largely interested in the formal realizations of focus. Focus is, for the most part, realized prosodically in English, but in other languages it can be realized through movement or with a morphological marker (see the survey in Büring 2009). These various formal manifestations are, in the syntax literature, usually identified with an inflectional head in the extended verbal projection. The focus head can trigger movement into its specifier or be real-

ized morphologically. This has been argued most famously for Italian (Rizzi 1997) and Hungarian (Horvath 1986:44–51, É. Kiss 1987:56–61, 1998).

But this approach to focus leaves some fundamental questions unanswered. Linking focus to a certain syntactic position does not tell us anything about what focus is. Focus might be a reflection of discourse structure or it could evoke focus alternatives in Rooth's sense, or it could simply convey an exhaustive interpretation, as É. Kiss (1998) would have for Hungarian (her identificational focus). To build a comprehensive theory of focus, we need to think about how these formal manifestations map on to a more abstract conception of focus. How do we square our abstract notion of focus with the varied formal realizations it can have within and across languages?

6.4 Pragmatic theories

While syntacticians and semanticists have only recently started talking seriously about focus as a discourse phenomenon, this approach has served as the foundation for the research program of Ellen Prince and her students. Since the 1970s, they have been investigating how a range of expressions and constructions interact with the discourse. This includes Prince's original (1978) work on *it*-clefts and pseudoclefts, but also subsequent studies of topicalization (Ward 1988, 1990), inversion (Birner 1994, 1996), and truncated clefts (Birner et al. 2007).

The core notion is the OPEN PROPOSITION (Prince 1986), a sentence with one or more free variables. The constructions above all presuppose some sort of relationship to a certain open proposition. An *it*-cleft like *It was a [SHIRT]_F that she gave to Harry* presupposes 'She gave X to Harry'. The free variable of the open proposition corresponds to the focused pivot of the cleft. The affinity of this approach to the question-under-discussion framework is clear. Open propositions are another way of structuring discourse and of talking about the current conversational issue. (Formally, they are also quite similar to questions: collecting all of the assignments for the free variable yields a set of propositions.)

Despite this similarity, there has been little connection in the literature between the constructions of traditional concern to semanticists (mainly, association with focus) and those studied within the Princian paradigm. (To his credit, Rooth (1985:210ff.) does mention *it*-clefts.) Do *it*-clefts, for instance, associate with focus?

These three approaches diverge in many ways. More importantly, though, there are real points of convergence, in the phenomena they look at and in the formal tools use. As we move forward, my hope is that we will be able to integrate these diverse strands of research to arrive at a richer and more comprehensive understanding of focus in the world's languages.

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