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A Curious Adverbial construction

Syntax and the Interface with Semantic and Pragmatic

Interpretation

THESIS SUBMITTED FOR THE DEGREE "DOCTOR OF PHILOSOPHY"

by

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This has been a long journey. I never thought that I would end up writing anything in formal semantics, least of all a PhD dissertation, but the data is a cruel dictator and I had to follow its lead. I would have never been able to follow its lead so faithfully if it hadn't been for my advisor Nirit Kadmon. She proved herself to be the most patient teacher, a conciencious PhD advisor, and a beloved friend all in one. Seroiusly Nirit, I would never have finished this, if not for you. I also wish to thank my second advisor Tali Siloni, who stuck with me as the waves were carrying me from one interface to another.

I have been off and on in the Linguistic department of Tel-Aviv university for many years now. Many of my former fellow students are now Doctors and Professors. I was lucky to have so many dear friends who lent me an advice, commented on extremely premature versions and have always been there for me. I especially wish to thank Doctor Gabi Danon of Bar Ilan University, for fruitful discussions, reading lists, and important critique. I also wish to thank my old friend Doctor Dorit Ben-Shalom, for her clear thought and friendship. I am also in debt to all members (faculty and students) of the Linguistic department in Tel-Aviv University, because everybody helped me in something along this journey.

I also benefited from the colloquia of the Linguistic departments of other Universities. I want to note especially the colloquium of Ben Gurion University of the Negev, who listened to premature versions of this work, and always gave great comments for improvements.

As I already hinted, I am very much a slave of the data. I could not be so, if I hadn't had a group of never tiring informants: my former students and their numerous friends,

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Abstract

The dissertation is concerned with configurations, in which adverbs of the Infl. domain are found preceding a DP or a PP within the VP, as illustrated in (1).

(1) a ben metaken tamid et hamexonit hakxula
Ben fixes always acc the-car the-blue (Ben fixes always the blue car)

b ben tamid metaken et hamexonit hakxula
Ben always fixes acc the-car the-blue (Ben always fixes the blue car)

In this dissertation I refer to sentences like (1b) as Infl. sentences, and to sentences like (1a) with the adverb in the VP as Wijler sentences[1]; my main concern lies in sentences like (1a), which show specific restrictions on distribution, as well as on the semantic and pragmatic interpretation. I will show that theories explaining superficially similar alternations as a reflex of a syntactic movement of the verb, or of a prosodically motivated dislocation cannot be used to account for the distinctions in semantic and pragmatic interpretation, as well as for the restrictions on the distribution of adverbs.

A prominent property of Wijler sentences distinguishing them from Infl. sentences is that very often the adverb in Wijer sentences must 'associate' with the immediately following DP or PP, whereas the adverb in Infl. sentences may but need not 'associate' in the same sence.

Informally speaking 'association' refers to cases in which the denotation of the argument affects the semantics of the adverb. For instance:

Ben fixes always the blue car *always* associates with *the blue car*
Ben fixes x all events of Ben's fixing x, x is the blue car

It intuitively means that the adverb comments on the connection between the associate and the skeleton (does it verify the skeleton or not?, On what/how many occasions does it verify the skeleton? etc.). Association of *always* often induces an exhaustive statement. For example, (1a) means that there are no occasions on which Ben fixes anything other than the blue car, whereas (1b) it can have this and various other interpretations

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1 Yes, this is a bit embarrassing; I am perfectly aware that an author is not supposed to name something after themselves…What happened was that the terms kept being a nuisance – some too long, some not mnemonic…Until one of my advisors, Nirit Kadmon, said that she was sick of it, and insisted on the term Wijler sentences. I went along with it 'temporarily', but it stuck.

One could hypothesize that Wijler sentences are licensed by 'association', however, there are contexts in which an Infl. sentence associating with a DP is licensed, and the corresponding Wijler sentence is not.

> CONTEXT: Ziva saw Ben eating an apple, but his mother who was not there thinks that he ate some candy instead, and she is upset about it.

(2) a   Ziva: lama at   do'eget, hu davka   axal <u>tapuax</u>
           Why you worried? He DAVKA ate apple

     b   #Ziva: lama at   do'eget, hu axal davka <u>tapuax</u>
            Why you worried? He ate DAVKA apple

In order to account for the obligatory 'association', I assume that the adverb and the DP/PP immediately following it form a syntactic constituent. In addition I will stipulate that the syntactic argument of an adverb in this paradigm must be its semantic argument. Thses two assumptions will enable me to account for the facts of the obligatory association.

In my syntactic and semantic analysis of Wijler sentences, I will propose that the adverb comments on the claim that the DP or PP are assigned a given role in the event. This would allow me to account for the semantic properties of Wijler sentences, e.g., an existential entailment with negation.

(3) a   ha'iSa lo xacta et hakviS be-maavar haxacaya
         the-woman not crossed acc the-street at the pedestrian crossing
             …and in fact she did not cross at all

     b   ha'iSa xacta et hakviS lo be-maavar haxacaya (a police report)
         the-woman crossed acc the-street not at the pedestrian crossing
             …#and in fact she did not cross at all

In (3a) the negation applies to the entire proposition, and therefore there is not existential entailment, whereas in (3b) the negation comments on the claim that the location of the event was the pedestrian crossing, and hence the existential entailment.

Wijler sentences also have a discourse function, which is to contradict a (deontic or epistemic) expectation of the speaker that the described state of affairs would be different. In (3b) for example, there is an inference that the speaker considered it 'wrong' of the woman to cross where she did, i.e., she (deontically) expected her to cross at the pedestrian crossing.

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Chapter 1: Introduction

1.1 Preliminaries

1.1.1 The Wijler sentences[2]:

In this dissertation I explore a configuration of Modern Hebrew, in which Infl-Domain adverbs are positioned within the VP; I use the term *Infl.-Domain* as a cover for different functional projections between the VP and IP (i.e., TNSP, ASPP, TruthP, etc.), the distinctions among which are not relevant to the current discussion. The examples below illustrate the two configurations with *bekoSi* 'barely' and *tamid* 'always'.

(1)   a   Salom axSav bekoSi meyaceget et acma
            Peace Now barely represents acc itself

        b   Salom axSav meyaceget bekoSi et acma
             Peace Now represents barely acc itself

(2)   a   hi tamid loveSet et ota xulca
            she always wears   acc the-same-shirt

        b   hi loveSet tamid et ota xulca
            she wears   always acc the-same-shirt

In (1a) and (2a) the adverb is in the Infl. domain and it immediately precedes the verb, and in (1b) and (2b) the adverb follows the verb, and immediately precedes the argument *itself*. I will henceforth refer to sentences of the structure illustrated in (1a) as **Infl. sentences**, and to the ones illustrated in (1b) as **Wijler sentences**. The purpose of the dissertation is to provide a theory to explain the distribution and interpretation of adverbs in the Wijler sentences.

1.1.2   The Adverbs

The adverbs under consideration are sometimes referred to as *focus sensitive adverbs,* implying that they tend to 'associate' with an element in the sentence. For present purposes, let us use the term 'association' informally. We intuitively identify the

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2 Yes, this is a bit embarrassing; I am perfectly aware that an author is not supposed to name something after themselves…What happened was that the terms kept being a nuisance – some too long, some not mnemonic…Until one of my advisors, Nirit Kadmon, said that she was sick of it, and insisted on the term Wijler sentences. I went along with it 'temporarily', but it stuck.

'associates' in the following sentences as follows (I will underline the 'associate' throughout the dissertation):

    (a) Only <u>Bill</u> smiled   *only* associates with *Bill*
        x smiled   **Bill** is the only value for x that verifies this.

    (b) She speaks only <u>Chinese</u>   *only* associates with *Chinese*
        she speaks x   **Chinese** is the only value for x that verifies this.

    (c) I only have eyes for <u>you</u>   *only* associates with *you*
        I have eyes for x   **You** is the only value for x that verifies this.

    (d) Bill didn't buy a <u>red</u> jacket   negation associates with *red*
        Bill bought a P jacket   **Red** is a value for P which does not verify this.

    (f) I even introduced <u>Bill</u> to Sue   *even* associates with <u>*Bill*</u>
        I introduced x to Sue   **Bill** is the value for x least expected to verify this.

    (g) The sun always sets in the <u>west</u>   *always* associates with *west*
        The sun sets in x   For every event e of the sun setting, **the west** is a value for x which verifies the sun set in x at an event.

We may say that in all cases of 'association', the 'prejacent' (the sentence minus the adverb) may be factored out into a '<u>skeleton</u>', which is an open formula, and an '<u>associate</u>', which is a value for the free variable in the skeleton (as illustrated with the above sentences). Intuitively, 'association' means that the adverb comments on the connection between the associate and the skeleton (does it verify the skeleton or not?, On what/how many occasions does it verify the skeleton? etc.).

The adverbs in this dissertation are the following:

tamid 'always'

bekoshi 'barely'

davka 'contra-belief'

lo 'not'

kmi'at 'almost'

gam 'also'

rak 'only'

afilu 'even'

1.1.3   Methodology

Some of the data that I will consider is highly affected by context, and as a result judgments tend to vary among speakers. I take two steps in order to overcome this inherent problem, and obtain reliable data. First, I use many examples from actual use of the language (Google search, pod-casts, news papers, overheard conversations etc.), for which the problem is entirely avoided. However, in order to check the consequences of my theory I sometimes need to consult the speakers with invented sentences. In this case, I provide informants with verbalized degrees of acceptability. Informants are not asked to judge *grammatical* vs. *ungrammatical* because these are theoretical terms. Instead I present comments on the acceptability of the sentence in non-professional language. Informants are provided with a scale of four acceptability degrees, in order to capture variations and tendencies. Below I present the question that I put forth to my informants, for each judgment.

- Consider the sentence in such and such context, such and such intonation, and tell me which of these comments is the most suitable to characterize how you see it?

A.   Good - √

B.   OK, but I don't really like it - ?

C.   Rather bad, but still usable - ??

D.   Bad - #

Most of my informants are non-linguists, to avoid interference of linguistic theory and experience in judgments. I try to consult at least 30 informants over the age 15 for every invented sentence, but I sometimes get less responds. Crucially, I have no less than 18 speakers on every judgment.

1.2.   Empirical Observations

♦ **The fact that there exists an alternation between adverbs in Wijler sentences and the same adverbs in Infl. sentences**

For example, the alternation between (1a) and (1b), and the one between (2a) and (2b).

♦ **Distribution of adverbs in Wijler sentences is more restricted then in Infl. sentences with the same 'associate'**

(3) a #ben paga kim'at be-<u>lusi</u>
          Ben hit   almost in Lucy

  a ben kim'at paga be-<u>lusi</u>
        Ben almost hit in Lucy (Ben almost hit Lucy)

(4) a #ben katav bekoSi <u>mixtav</u>
        Ben wrote barely letter

  b ben bekoSi katav <u>mixtav</u>
        Ben wrote barely letter

(5) A: efo ben rac?
        where Ben running

  B: hu lo   rac   <u>ba-gina</u>
        He not running in-the-garden

  C: #hu rac   lo bagina
        He running not in-the-garden

CONTEXT: Ziva saw Ben eating an apple, but his mother who was not there thinks that he ate some candy instead, and she is upset about it.

(6) a Ziva: lama at   do'eget, hu davka   axal <u>tapuax</u>
              Why you worried? He DAVKA ate apple

  b #Ziva: lama at   do'eget, hu axal davka <u>tapuax</u>
          Why you worried? He ate DAVKA apple

♦ **Contextual restrictions on the distribution of adverbs in Wijler sentences**

(4') ziva hivtixa   li mixtav ve basof   hi Salxa li bekoSi pitkit
Ziva promised me letter and in-the-end she sent me barely note-diminutiv
(Ziva promised me a letter and in the end she sent me barely a small note)

(5') A: efo ben rac?
     where Ben running

 B: hu lo   rac   ba-maslul
 He not running in-the-track

 C: hu rac   lo ba-maslul
 He running not in-the-track

CONTEXT: Ziva is a kindergarten teacher, and she always tells the kids not to eat candies. Today she caught Ben eating a candy when he was supposed to eat an apple. When Ben's mother comes to pick him up she says:

(6') karagil   ben axal davka   sukarya
as-usual Ben ate contra-belief candy

♦ **The adverb in the Wijler sentences is obligatorily 'associated' (in the intuitive sense) with the adjacent argument, whereas in Infl. sentences it is optionally associated with any expression in its syntactic domain.**

(7) a dan hexna et haoto davka al maavar haxacaya
     Dan parked acc the car contra-belief on the pedestrian crossing

Necessary interpretation:

Skeleton: Dan parked the car on (location x)   *Associate*: the pedestrian crossing

The value *the pedestrian crossing* gives rise to a sentence contradicting a belief.

 b dan davka acar et haoto al maavar haxacaya
     Dan contra-expectation stopped the car on the pedestrian crossing

The above interpretation is compatible with (7b), but other interpretations are also possible, for instance:

Skeleton: Dan stopped x on the pedestrian crossing   *Associate*: the car

The value *the car* gives rise to a sentence contradicting a belief.

(8) a ha'isha xacta et hakvish lo bemaavar haxacaya
     the-woman crossed the street not at the pedestrian crossing
     (Haaretz 12.5.09 – quoting a police report)

<u>Necessary interpretation</u>:

Skeleton: The woman crossed the street at x   *associate*: the pedestrian crossing

The value *the pedestrian crossing* does not verify the skeleton.

      b   ha'isha lo xacta et hakvish bemaavar haxacaya
          the-woman (did) not cross the street at the pedestrian crossing

One possibility: the above interpretation

Another possible interpretation:

Skeleton: The woman VP   *Associate*: crossed the street at the pedestrian crossing

the value *crossed the street at the pedestrian crossing* does not verify the skeleton.

- ♦ **The Wijler sentences induce an inference that the speaker expected the reported state of affairs to have been different.**

   (9) a   ben roked tamid im lusi
           Ben dances always with Lucy

Inference: the speaker expected that there would be events of Ben dancing, in which Lucy was not his partner.

      b   ben tamid roked im lusi
          Ben always dances with Lucy

No inference concerning the speaker's expectations

   (10) a   hatoxna haxofshit tiltela gam et shuk hatelefonya (web example)
           the open source programming affected also the telephone market

Inference: The speaker expected it not to affect the telephone market

      b   hatoxna haxofshit gam tiltela et shuk hatelefonya
          the open source programming also affected the telephone market

No inference regarding the speaker's expectation

- ♦ **An effect of accusation in Wijler sentences**

   (11) a   Dan hexna et haoto davka al maavar haxacaya
           Dan parked the car contra-belief on the pedestrian crossing

Accusing Inference: the speaker considers it improper of Dan to park the car at the pedestrian crossing

b   Dan davka hexna et haoto al maavar haxacaya
Dan contra-belief parked the car on the pedestrian crossing

No Accusing Inference

(12) a   ha'isha xacta et hakvish lo bemaavar haxacaya
the-woman crossed the street not at the pedestrian crossing
(Haaretz 12.5.09 – quoting a police report)

Accusing Inference: the speaker considers it improper of the woman to cross the
street where she did

b   ha'isha lo xacta et hakvish bemaavar haxacaya
the-woman (did) not cross the street at the pedestrian crossing

No Accusing Inference

Adverb Specific Effects:

♦   **Existential entailment with *lo* 'not' and *kim'at* 'almost':**

(13) a   ha'isha xacta et hakvish lo bemaavar haxacaya,
the-woman crossed acc the street not at the pedestrian crossing

…#ve beecem hi bixlal lo xacta
and in fact she (did) not cross at all

b   ha'isha lo xacta et hakvish bemaavar haxacaya
the-woman (did) not crossed acc the street at the pedestrian crossing

…ve beecem hi bixlal lo xacta
and in fact she (did) not cross at all

(14) a   sara hi'gi'a laavoda kim'at bazman
Sara arrived at work almost on time

…#aval hi lo higi'a laavoda bixlal
but she (did) not arrived at work at all

b   sara kim'at hi'gi'a laavoda bazman
Sara almost arrived at work on time

…aval hi lo higi'a laavoda bixlal
but she not arrived at work at all

(13a) entails that the woman did cross in some location, and consequently the denial
conjunct gives rise to a contradiction. (13b) does not entail that the woman crossed, and
therefore there is no contradiction. Similarly, (14a) entails that Sara arrived at work, and

consequently the conjunct gives rise to a contradiction, whereas (14b) does not entail that she arrived at work, and there is no contradiction.

♦ **An occasionally obligatory 'but-rather' conjunct with *lo* 'not' in Wijler sentences**

(15) a   #hataaruxa he'ira lo et haaman acmo
the-exhibition illuminated not the artist himself

   b   hataaruxa he'ira lo et haaman acmo ela et moladeto Italia
the-exhibition illuminated not the artist himself but rather his homeland Italy

   c   hataaruxa lo he'ira ethaaman acmo
the-exhibition (did) not illuminated the artist himself

(16)   ha'iSa xacta et hakviS lo bemaavar haxacaya
the-woman crossed acc the street not at the pedestrian crossing

♦ **When associated with an argument of the verb or an optional VP modifier, *rak* 'only', gam 'also/too' and *afilu* 'even' are marginal to unacceptable in Infl. sentences**

(17) a   hasheleg yarad afilu <u>bedalas</u> (web example)
the snow fell even in Dallas

   b   #hasheleg afilu yarad <u>bedalas</u>
the snow even fell in Dallas

(18) a   ha-yeled mi-barcelona koveS   gam et <u>ha-en-bi-ey</u>
the-kid from Barcelona conquers also acc the NBA

   b   #ha-yeled mi-barcelona gam koveS   et <u>ha-en-bi-ey</u>
the-kid from Barcelona also conquers acc the NBA

(19) a   universita beariel texazek rak et <u>haxazakim</u> (web example)
University at Ariel will empower only the powerful

   b   #universita beariel rak texazek et <u>haxazakim</u>
University at Ariel only will empower the powerful

♦ **tamid 'always' tends to be interpreted as exhaustive in Wijler sentences**

(20) a   ben metaken tamid et hamexonit hakxula…#ve lif'amim et hayeruka
Ben fixes always acc the-blue-car …and sometimes acc the green (one)

b   ben tamid metaken et hamexonit hakxula…ve lifʾamim et hayeruka
     Ben always fixes acc the-blue-car …and sometimes acc the green (one)

♦ **tamid 'always' is not always interpreted as exhaustive in Wijler**

   sentences

CONTEXT: Ben is a teacher in a dancing course for teenage kids. Every Friday night he goes with his students to dancing parties where they all dance and he dances with several of them. He dances with Lucy at all these parties. Sara (a fellow student) says to her friend:

(21) ben roked tamid im lusi meʾanyen ma ima Sela tagid al ze
     Ben dances always with Lucy, interesting what her mom would say about this

To sum up what we need to explain is:

♦ The alternation between adverbs in Wijler sentences and the same

   adverbs in Infl. sentences

♦ Restrictions on the distribution of adverbs in Wijler sentences

♦ Contextual effects on the distribution of adverbs in Wijler sentences

♦ Obligatory association in Wijler sentences

♦ The inference that the speaker expected the described state of affairs to

   have been different in Wijler sentences

♦ The inference that the speaker considers the described state of affairs to

   be 'improper' in Wijler sentences

♦ Existential entailment with lo 'not' and kim'at 'almost' in Wijler sentences

♦ The occasionally obligatory 'but-rather' conjunct in some Wijler sentences

♦ The optionality of a 'but-rather' conjunct in some Wijler sentences

♦ The impossibility to have *rak* 'only', *afilu* 'even' and *gam* 'also' in Infl. sentences when associated with an argument of the verb or with a verb phrase modifier

♦ The exhaustivity of *tamid* 'always' in Wijler sentences and its occasional absence

1.3 The Structure of the Dissertation

In the following two chapters, chapter 2 and chapter 3, I explore hypotheses that the alternation between Wijler sentences and Infl. sentences is a result of syntactic movement, or of a prosodically motivated dislocation. I will, show these hypotheses cannot be maintained because they do not allow for an account for the observed properties of the distribution and interpretation of adverbs in Wijler sentences. In chapter 2, I discuss syntactic and PF theories of verb movement, and show that they could not be used explain the entire range of the data under consideration. In chapter 3, I present theories explaining alternations which are superficially similar to the one I discuss, in terms of a prosodically motivated dislocation. I will argue that a prosodically motivated dislocation cannot be used to account for the semantic distinctions between Infl. sentences and Wijler sentences. In chapter 4, I discuss the hypothesis that the Wijler sentences are licensed by 'association' or 'association with focus', and show that this hypothesis cannot be adopted because it would fail to account for cases in which a Wijler sentence is unacceptable, and the Infl. sentence with the same associate is. In chapter 5, I present theories concerning the syntax-semantics interface in the grammar of adverbs, focusing specifically on the claim of compositionality in the interpretation of adverbs. I will show that the semantics of Wijler sentences provides empirical support for the compositionality hypothesis. In chapter 6, I propose a theory of the syntax and semantics of Wijler sentences, and show how it accounts for their semantic and syntactic properties. In chapter 7, I present discuss the discourse function of Wijler sentences, and show how it accounts for contextually determined restrictions of the distribution of adverbs in Wijler sentences, and some elements in their interpretation. In chapter 8, I conclude.

Chapter 2: Syntactic Accounts – Optionality, Discourse Dependence and Semantic Effects

2.1   Introduction

The purpose of this chapter is to eliminate a syntactic verb movement account of the alternation between Infl. sentences and Wijler sentences. The problem with a syntactic movement of the verb is not expected to affect the interpretation of the adverb or of the argument. Furthermore, a syntactic movement of the verb, is not expected to depend on context.

> CONTEXT: Ziva saw Ben eating an apple, but his mother who was not there, thinks that he ate a candy instead, and she is upset about it.

(1) a   lama at do'eget, hu davka axal tapuax
    Why are you worried? He DAVKA ate an apple

   b   #lama at do'eget, hu axal davka tapuax
    Why are you worried? He ate DAVKA an apple

In the same context, the mother would say felicitously:

> c   uff, hu axal davka sukarya
> UFF, He ate DAVKA a candy

The only distinction between the unacceptable (1b) and the acceptable (1c) is that in that context the speaker has no reason to expect that Ben would eat anything other than the apple, whereas the speaker of (1c) (deontically) expects that he would eat an apple instead of a candy
It would be hard to conceive of a syntactic operation of verb movement being dependent on such considerations. Moreover, it is not feasible that a syntactic verb movement operation, would give rise to a restriction on the semantic interpretation of the adverbs (e.g., the obligatory exhaustivity of *always*).

The chapter consists of two main parts, the first of which is Section 2.1, presenting syntactic and PF theories of Verb movement (Chomsky 1957, Pollock 1989, Chomsky 1991, Lasnik 1999, Boeckx & Stjepanovic 2001). In Section 2.1.1 I present syntactic theories of Verb movemnt, and show that it could not be used to account for the

alternation between Wijler sentences and Infl sentences. In 2.1.2, I present arguments for assuming that Verb movement is a PF phenomenon, and a hybrid theory in which verb movement is a syntactic operation affected by PF considerations. In Section 2.1.3, I turn to the idea of deriving Verb movement as a PF-phenomenon altogether. I present arguments for this idea, and show that a fully-fledged PF theory of V-movement is still not available. In Section 2.1.4, I conclude the discussion, showing that both a PF and a syntactic verb movement could not be used to account for the relevant alternation.

The second part of the chapter involves syntactic movement theories for alternations involving discourse considerations (Chomsky 2001, Bobalijk 2002, and Horvath 2009). In Section 2.2.1, I present Horvath's 1999 arguments for the Strong Modularity Hypothesis and its applicability to the discussed phenomena. In Section 2.2.2, I discuss Chomsky's 2001 theory of Icelandic OS, present a problem for it. In Section 2.2.3, I present another syntactic theory of Icelandic Object Shift (Bobalijk 2002), and discuss some of its problems. In Section 2.3, I conclude the discussion and show that the alternation between Wijler sentences and Infl sentences cannot be a result of a syntactic movement of the verb.

2.1.1 Syntactic Verb Movement – (Chomsky 1957, 1991, 1995, Pollock 1989, Matushansky 2006, Grodzinsky and Finkel 1998)

2.1.1.1 Word Order and Morphology (Chomsky 1957, 1991, Pollock 1989)

Adverbs intervening between the verb and its complement are intriguing for the theory of syntax, because we assume that verbs and their complements are merged first, and any subsequent merged elements are predicted to appear outside of the V'. Intervention of adverbs between the verb and its complement is problematic, because adverbs are not moved by syntactic operations. Languages and constructions in which adverbs appear between the verb and its complements have long been under discussion (Chomsky 1957, Emonds 1978, Lasnik 1981, Pollock 1989, Chomsky 1991, Chomsky 1995, Lasnik 1999). Adverb intervention in VO languages is traditionally analyzed as resulting from V to T movement. The idea is that since adverbs don't move, their

positioning in a different order relative to a head signifies that the head was moved. Theories of Verb movement were also designed to explain cross-linguistic correlations between word order and agreement morphology. Chomsky 1957 discussed the ordering of English verbs and negation. He claimed that every verbal head needed to get to a higher inflection head in order for its inflectional affixes of tense and agreement to be assigned. Chomsky argued that English auxiliary verbs raised to Infl. were assigned inflectional morphemes. As a result they precede negation, which is situated below Infl.

(2) a   Max has not kissed her

b   *Max not has kissed her

(3) a   Max is not happy

b   *Max not is happy

Chomsky's second observation is that English lexical verbs cannot be raised to Infl., and they therefore must follow the negation element, as well as time quantificational adverbs, that are assumed to be adjoined above the VP.

(4) a   Max did not kiss Mary

b   *Max kissed not Mary

(5) a   Max often kisses Mary

b   Max kisses often Mary

Chomsky claimed that English lexical verbs could not be raised to Infl., and therefore the inflectional morphemes had to be lowered onto the verb ("affix hopping"). Chomsky's theory of V-raising for morphological purposes inspired a cross-linguistic research of V-raising and morphology. Following Emonds (1976), Pollock turns to the distinctions between English and French with respect to V-raising. He observes that in French the lexical verbs are raised to Infl., giving rise to the reverse paradigm from English (the following examples are from Pollock 1989: p 367).

(6) a   *John likes not Mary

b   Jean (n')aime pas Marie
Jean likes not Marie

(7) a   *John kisses often Mary

b   Jean embrasse souvent Marie
Jean kisses often Mary

c *Jean souvent embrasse Marie
Jean often kisses Mary

The generalization is that in English, lexical verbs cannot be raised and auxiliary verbs must be raised, and in French, all inflected verbs can and must be raised.

In order to account for the English-French paradigm, Pollock argues that Infl. consists of two separate heads, one with TNS morphemes and another with AGR, and he argues that negation is also a functional head, positioned above the AGR projection and below TNS, as in (8) below.

(8)
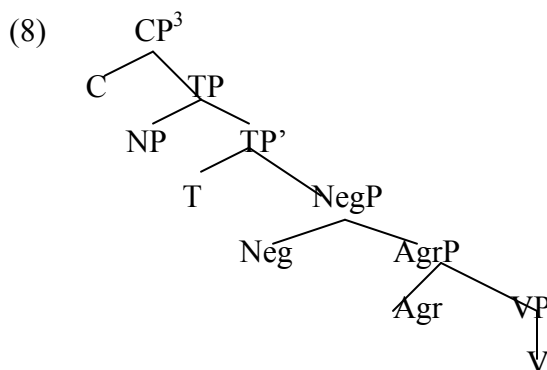
Pollock claimed that English agreement is opaque to θ-assignment, and therefore if a lexical verb is raised to Agr it would fail to assign θ-roles to its arguments.

By contrast, French agreement is transparent, and the verb may be moved to AGR with no failure of θ-assignment. In order for the affixes to be attached to the English lexical verb, TNS must lower to AGR, and the complex head TNS+AGR is lowered to the VP, where the morphemes are assigned to the verb. Assuming that the auxiliary verbs *have* and *be* do not have θ-roles, Pollock correctly predicts that they would be allowed to be raised on a par with French lexical verbs. Pollock tied the 'theta-transparency parameter' to the actual morphology in the language. He claimed that languages in which there were relatively many agreement morphemes (person, number, etc.) have a 'strong agreement', which is transparent to the theta role assignment, while languages with less agreement morphemes have 'weak agreement', which is opaque to the theta assignment. Pollock showed that head movement respects the Empty Category Principle - ECP (Chomsky 1986), providing further support for its analysis as a syntactic movement. The ECP

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[3] I omit details that are irrelevant to this discussion, specifically, the Spec positions of Neg and Agr.

determines that each trace must be properly governed, and this implies that movement proceeds in short steps from one governed position to another. When one of the positions on the V-movement track is occupied, movement cannot proceed, because it would leave a trace that would fail to be properly governed. Pollock argued that this explains the correlations between V-to-T movement, and verb movement to Comp. in questions.

(9) a Aime-t-il Marie?
Love-3rd-he Marie

    b *Loves he Mary?

    c Has he kissed Mary?

The data in (9) shows that verbs that can be moved to AGR and TNS, can also be moved to Comp, in questions, and verbs that failed to raise to the first stop (AGR) could not be moved further. This is predicted by the ECP, since the trace of the English lexical verb in the VP is not properly governed by an antecedent in Comp. Pollock's theory, also accounts for the fact that old English displays the French paradigm, because it had more agreement morphemes, making its agreement transparent to the theta assignment, and it was correctly predicted to raise the verb to Infl. Pollock also accounted for the correlations between short and long V-movement, based on the ECP.

Further research along these lines retained by Pollock's 1989 innovation of the split Infl, but the exact mechanism deriving verb movement was reformulated in order to achieve a better descriptive and explanatory result.

Chomsky 1991 addressed the fact that French lexical verbs, and English auxiliary verbs, had to be raised to Infl. in order to yield a grammatical sentence, and that their agreement morphemes could not be lowered onto them, though it was a UG alternative. Chomsky accepted the reasons that weak agreement did not allow Verb-raising, and he argued that the reason that strong agreement necessitated movement was due to a general economy principle.

(10) *Chomsky 1991 – Economy of derivations*: *Raising an element is more economical then lowering, because lowering will leave an unbounded trace (not properly governed), and this will have to be remedied by re-raising of the element at LF.*

The prediction of (10) is that whenever raising of an element is allowed, it would be applied, and lowering would be used only as a last resort. This predicts the English - French paradigm, explaining why lexical verbs had to be raised in French, and auxiliary verbs had to be raised in English. Chomsky also accounts for the observation that English inflectional morphemes could not perform the "affix hopping" operation across an intervening negation.

(11) a *John not likes Mary

   b John does not like Mary

(11) shows that the inflectional morphemes could not be lowered and the dummy verb DO had to be inserted so that they would not stay stranded.

Chomsky assumed the following tree structure, where in addition to the split between Agr and TNS, there is a split between Agr_s and Agr_o, and a functional head of negation.

(12) Agr_sP

NP Agr_s'

   Agr_s TP^4

      T   NegP

         Neg Agr_oP

            Agr_o VP

                  V
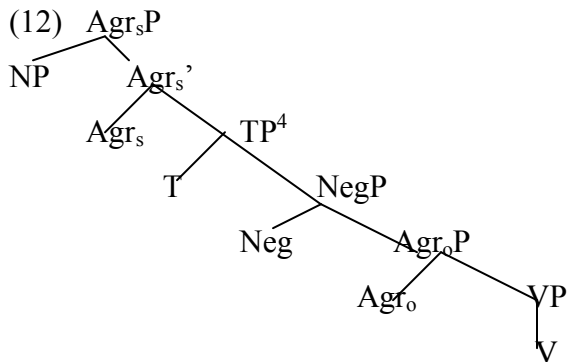
In (12), the verb may not be overtly raised to Agr_o, because overt movement to weak agreement is assumed to be impossible. As a result Agr_o must lower to the VP, creating a complex node, headed by V. This node must then be raised to T at LF, in order to avoid leaving an unbounded trace. In (11a) LF raising fails because T does not properly govern the trace of the raised head due to the intervention of the NEG head (assuming Rizzi 1990 Relativized Minimality). The reason that NEG does not block overt raising of the verb to T in French and of auxiliary verbs in English, is that the verb first raises to AGR and AGR traces are deleted at LF. Once the traces are deleted, there is no requirement of

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[4] For ease of presentation, I leave the spec positions of TP, NEGP and AGR_OP out, because they do not play a role in the phenomenon I discuss here.

proper government, and Chomsky correctly predicts that negation would pose no problem for overt raising of the verb. By contrast, after the morphemes have been lowered to the verb, the trace is a V trace, which is not deleted at LF and therefore subjected to the ECP. To conclude, the V-movement theory at this stage (Pollock 1989, Chomsky 1991) accounted for the English - French paradigm. It predicted no optionality for V-movement, due to the economy condition in (10), and V-movement was integrated in the general theory of syntactic movement, as it was shown to respect the ECP. In the following section the problems that led people to suggest that V-movement should not be analyzed as a specimen of syntactic movement, but rather as a PF operation are addressed.

2.1.1.2 Problems and Potential Solutions in Head Movement- (Chomsky 1995, Matushansky 2006, Grodzinsky and Finkel 1998)

Chomsky 1995 argued for a general economy principle, *the extension principle*, which determines that internal merge (MOVE) can occur only when it extends the syntactic tree, i.e., only at the root of a maximal projection. This also ensures that the moved element c-commands its trace (the proper government requirement), as can be seen in the sketch below. The terminal element α has been moved, extending the tree, and it c-commands its trace.

(13)
$$\alpha P$$
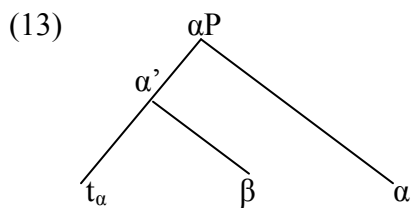
Heads are assumed to adjoin to existing heads after head movement (V+Agro etc.), so they do not extend the tree, and they do not c-command their trace. This was the reason that the HMC (Head Movement Condition) was stated separately of the more general ECP.

> *HMC (Chomsky 1986): Movement of a zero-level category β is restricted to a position of a head α that governs the maximal projection γ of β, where α theta governs or L-marks γ if α≠Comp.*

The HMC does not require that the trace be properly governed by its antecedent, but that its antecedent be **contained** in a category that properly governs the trace. This also implies that the moved element does not c-command its trace, and cannot form a chain with it. A V-movement configuration illustrating these problems is presented in (14) below.

(14)

```
                    Agr_sP
         DP                  Agr_s'
        Jean    Agr_s              TP
           Agr_s    T       T           NegP
          (n')aime_k    T  Agr_o  Neg        Agr_oP
                                        Agr_o      VP
                                      Agr_o   V   V    DP
                                                 t_k   Marie
```
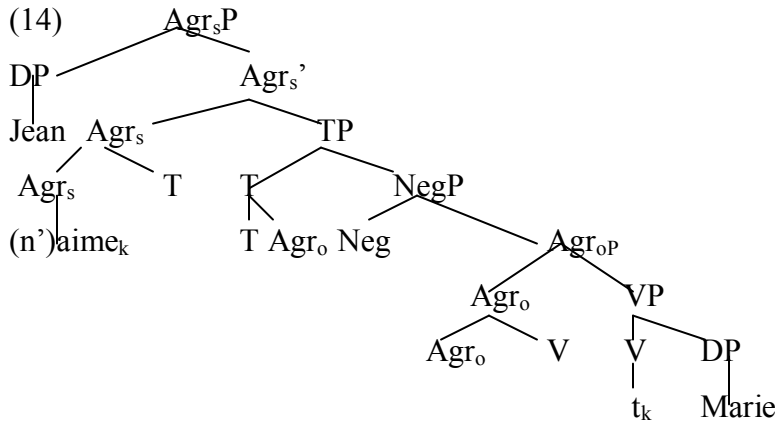
In (14) the trace of the moved verb is not c-commanded by the moved verb because it is embedded in Agr_s', and the verb did not extend the tree since it does not adjoin to the root. The extension principle could be technically bypassed, just as the c-command requirement in 1986 was bypassed by the HMC. Matushansky 2006 argues that head movement operates in the same way as XP movement, and it is attached to the root of the tree, as in (15), where (15a) illustrates the two heads that are required to be related by head movement, and (15b) illustrates the movement operation (taken from Matushansky 2006: p. 81).

(15) a

(15) b
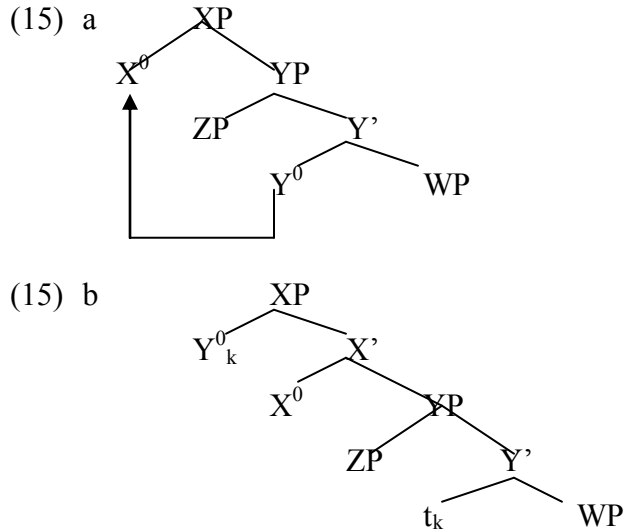
In (15b) the head Y is merged at the root, so that there is no violation of the extension principle, and the trace is c-commanded as required. Matushansky attributes the necessary relations between the two heads Y and X, to a morphological operation applying in the syntax, that merges two linearly adjacent elements.

This way she avoids the assumption that the moved Y^0 is merged to X^0, thus enabling a unified account of syntactic movement. The extension principle in itself does not constitute a real counterargument for assuming that head movement is not a syntactic operation. There is additional evidence suggesting that the claim that Head movement is not a syntactic operation needs to be reconsidered. In a syntactic theory deriving Scandinavian Object Shift (Chomsky 2001 to be presented in Section 2.5.1 below), makes use of V to T movement, and argues that at least the first step in the movement of verbs must apply in narrow syntax (this will be discussed in the following section in more detail). If Matushansky's 2006 theory is correct, then this assumption does not force a reconsideration of the Extension Principle.

However there is strong evidence suggesting that minimally, Head movement and XP-movement are not the same kind of operation and that they do not create a chain in the same way. Grodzinsky and Finkel 1998 bring evidence that a range of symptoms in aphasia can be accounted for in terms of the inability to identify XP chains, but that these results do not carry to X^0 chains. Assuming that head movement is not a syntactic operation, we correctly predict that it does not create chains and accounts for the apparent mismatch. On the other hand, if we assume as Matushansky that it is the same kind of

operation, there is no way to account for this discrepency. One could argue that these are two distinct syntactic operations, but the theory of movement becomes much less attractive once we assume different kinds of movement, giving rise to psychologically different kinds of chains. Nevertheless, it is clear from the above discussion that this issue requires further empirical evidence.

2.1.1.3   Syntactic V-movement and Wijler sentences

The V-movement theory cannot account for the Wijler sentences, because the alternation is independent of morphological strength, or the choice of a verb (e.g., *Peace Now represents barely itself*, vs. *Peace Now barely represents itself*). One could hypothesize perhaps that verb movement is optional, stating it as strong and weak features on each verb, but this could not explain the discourse restrictions on the alternation (e.g.,*#he ate davka an apple* vs. *he ate davka a candy*), and it could not explain the semantic distinctions in the interpretation of the adverb (e.g., the existential entailment of negation).

2.1.2   Head Movement- Dividing Labor between Syntax and PF

Chomsky 1995 has abandoned the idea that the verb moves in order to be assigned its morphology. He argues that verbs come fully inflected from the lexicon, and are raised to an agreeing head in order to check off the head's abstract features. When the moved head gets to AGR, the abstract features on AGR are checked and deleted. Abstract features are uninterpretable at the interface levels, and if they fail to be deleted before the interface, the result would be ungrammatical. Both weak agreement and strong agreement must be checked and deleted. The distinction between weak and strong features is that weak features are "invisible" to Phonological interpretation, so they need not be deleted before spell-out, but they are visible for Semantic interpretation, and must therefore be deleted at LF. In addition, Chomsky introduces the procrastinate economy principle, determining that that covert movement is more economical than overt movement, and therefore it must apply, unless there are strong agreement features forcing overt movement. The minimalist version of V-movement thus accounts for the word-order

distinction between French and English. Assuming that English has weak agreement, its verb is correctly predicted to be moved covertly, and surface in its base position preceding negation and time-quantificational adverbs.

French on the other hand, has strong agreement features visible at PF, requiring that the verb move overtly, and it surfaces following negation and time-quantificational adverbs. In the next section the morphological data that received an explanation in the Pollock 1989, Chomsky 1991 version of verb movement, but not in the Chomsky 1995 version, are discussed.

2.1.2.1   Affix Hopping in PF – (Lasnik 1999)

In Chomsky's 1995 version of V-movement, there are no lowering rules, and in particular there is no rule lowering Infl. to the verb in the case of weak agreement features. This follows because morphology is assumed to take place in the lexicon, and there are no syntactic operations motivated by the need to avoid stranded morphemes. This implies that the new version fails to account for data that was explained in previous versions by the lowering of Infl. to the verb.

(16) a *John likes not Mary

      b John does not like Mary

      c *John not likes Mary

(17) a *John not was happy

      b John was not happy

(18) a *John not has walked

      b John has not walked

Negation does not block V to T movement, because traces of AGR delete. This is a necessary assumption, in order to account for the fact that there is no problem in Verb raising over negation in French, or for the auxiliary verb raising in English (e.g., (2a), (3a), and (6b) above). The prediction of the Minimalist Program V-movement is that (16c) would be grammatical, because the verb is raised covertly in much the same way that the French verb is raised overtly, and negation need not constitute a problem in either of them.

Furthermore, English weak features on Infl. cannot be affected by the choice of auxiliary verb and the *Procrastinate* principle determines that movement for checking weak features is postponed to LF, thus wrongly predicting that overt movement of the auxiliary verbs would be ungrammatical (17b 18b), and covert movement would be grammatical (17a, 18a).

Chomsky 1995 offers a way out of the auxiliary problem, claiming that '*have*' and '*be*' do not have semantic content, and that they are therefore invisible at LF and must therefore check off the agreement features before spell-out. Lasnik 1999 argues that this analysis is empirically problematic since *have* and *be* are also moved overtly, in cases where they have a semantic content.

> (19) a There is a solution
>
>   b There is not a solution

According to Lasnik, the semantic interpretation of *is* in (19a) is something like 'exists' and this meaning cannot be deleted before LF, but nevertheless it is raised overtly. Based on data as in (16)-(19), Lasnik 1999 proposes a PF operation for assigning morphemes to lexically bare verbs. In this he partially retreats from the Minimalist version of V-movement, going back to assuming syntactic operations ensuring morphological outcome. In contrast to Chomsky 1995, Lasnik argues that not all verbs are lexically inflected, so that some of them require a morphological operation in PF. Following Chomsky 1995, Lasnik assumes that uninterpretable agreement features must be checked off before the relevant interface, but he argues in addition that there are uninflected (bare) verbs, which must reach a syntactic structure, allowing the PF-morphemic operation. A failure to perform the PF morphological operation would cause a crash in the derivation, because the stranded bound morphemes are unpronounceable. Lasnik needs to assume that there are Infl. heads with abstract features and ones with actual morphemes. The effect of 'affix hopping' shows up when Infl. contains actual morphemes and the verb is lexically bare. Lasnik's 1999 is summarized below.

> *Lasnik 1999 – PF theory of the effects of affix hopping*:
>
>> *A. Verbs can be either lexically inflected or lexically bare:*
>>
>>> *1. French verbs are lexically inflected*
>>>
>>> *2. English auxiliary verbs Have and be are lexically inflected*

> *3. English lexical verbs are lexically bare*
> *B. Infl. can contain either a set of abstract features or a set of bound morphemes (affixes).*
> *C. The Finite Infl. feature is strong in French and in English.*
> *D. Affixal Infl. must MERGE with a bare verb in PF, and this requires linear adjacency.*

Affixal Infl. requires lexically bare verbs (e.g., English) because otherwise the bound morphemes would be left stranded, where they are unpronounceable. Suppose that the sentence has an affixal Infl. and a bare verb. When Infl. and the verb are immediately adjacent, the sentence is predicted to be grammatical, but when *not* intervenes, the bound affixes are stranded in violation of the PF requirement, and the sentence is correctly predicted to be ungrammatical (**John not likes Mary*). The insertion of 'DO' is required in order to ensure that the affixes are not stranded (*John does not like Mary*).
Assuming that French verbs and English *Have* and *be* are lexically inflected, they can check off the abstract features of a featural Infl., as in common assumptions. If the choice is of featural Infl. then the verbs must be moved overtly to check off the features, because agreement in both languages is strong. This correctly predicts the grammatical (17b) *John was not happy* and (18b) *John has not walked*, as otherwise the derivation crashes because there are uninterpretable features at PF. This accounts for the facts if we assume an affixal Infl. for lexical English verbs, and a featural Infl. for French verbs and English auxiliary verbs. However, the choice of Infl. is arbitrary, and Lasnik shows how the problematic derivations can be ruled out: a featural Infl. with a bare verb would lead to a derivation crash due to uninterpretable features; and an affixal Infl. with a lexically inflected verb would lead to a crash because of the stranded unpronounceable bound morphemes. To sum up, Lasnik 1999 finds a way to accommodate the affects of morphology on syntax, without bringing PF-relations like linear adjacency to the syntax. His syntax gets the verb to place, but linear adjacency is checked at PF, where the morphemes are merged to the verb.
To conclude, Lasnik's 1999 hybrid model explains the English morphological reflex. Crucially, however the PF-element does not affect the impossibility to account for an alternation, which is not rooted in morphology, to make V-movement restrict the

semantic interpretation of the adverbs in question, or to explain the dependence on discourse considerations. In the next section a proposal to analyze the entire V-movement operation in PF is discussed.

2.1.3 A More Radical Move to PF – (Boeckx and Stjepanovic 2001)

Boeckx and Stjepanovic 2001 use a phenomenon of pseudogapping as empirical support for the hypothesis that Head movement as a PF operation. They discuss a previous syntactic account of pseudogapping (Lasnik 1999), and criticize it, arguing that a PF V-movement can provide a better account for the data.

2.1.3.1 Pseudogapping in a Model of PF V-movement

Lasnik 1999 uses pseudogapping as evidence for an overt movement of the object to Agr_oP in English (brackets indicate that the element that is omitted creating the gap).

(20) Debbie ate the chocolate and Kazuko did (eat) the cookie

Lasnik argues that the first step in getting (24) is an object shift to spec Agr_oP, as in (24').

(20') Kazuko …$_{AgroP}$[spec [the cookie][Agr_o[$_{VP}$ ate t]]]

The next step, according to Lasnik 1999, is VP ellipsis that deletes the remnant of the VP, yielding (20). According to Lasnik, the movement of the object is independent of ellipsis, and following object-movement in non-elided sentences the verb is overtly raised from V to T, as in (21).

(21) Kazuko…[[T] [ate$_k$]]…$_{AgroP}$[spec [the cookie$_j$][Agr_o[$_{VP}$ t$_k$ t$_j$]]]

Boeckx and Stjepanovic (henceforth B&S) point out that the verb could also be raised in the ellipsis case yielding (22).

(22) …and Kazuco…[[T] [ate$_k$]]…$_{AgroP}$[spec [the cookie$_j$][Agr_o[$_{VP}$ t$_k$ t$_j$]]]

Lasnik follows Ochi 1999 in assuming that overt movement is a pied piping operation, intended to repair the state of affairs where the word is in one location and its features are

scattered in different positions in the tree[5]. Assuming this analysis, Lasnik has a simple account for the fact that the verb is overtly moved, only in the non-elided sentence. In (21), overt movement is a pied piping repair operation, but once the verb is deleted by ellipsis, the need for pied piping is eliminated. B&S argue that Lasnik's theory depends on an unmotivated assumption that Object movement is obligatory and V-movement is not, or else it could wrongly predict that the verb would move first, deriving (23a), and then perform VP-ellipsis, deriving in (23b) the ungrammatical (23c).

(23) a Debbie got the chocolate and Kazuko [[T][got_k] [[Agr_o] [t_k][$_{VP}$ t_k chocolate]]]

b Debbie got the chocolate and Kazuko [[T][got_k] [[Agr_o] [t_k] ([$_{VP}$ t_k the chocolate])

c *Debbie got the chocolate, and Kazuko got

Lasnik's theory cannot account for the reason that V-movement is dependent on VP-ellipsis, but Object movement to Agr_o is obligatory.
Ellipsis would cancel the need for object raising in (23b) in much the same way as it canceled the need for verb movement in (20). B&S note that (23c) could be ruled out, based on independent considerations, because ellipsis is known to require a contrastive interpretation and (23) does not supply the appropriate conditions to interpret it contrastively. B&S argue that the contrastive property is not a part of the ellipsis theory, and as such it could not play a role in this argumentation. Furthermore they show that the derivation is ruled out regardless of contrast.

(24) *Peter kissed Mary and Tom [$_{Agro}$ $hugged_i$ [$_{VP}$ t_i (Mary)]]

In (24), the contrastive interpretation is licensed and the sentence is ungrammatical, showing that this derivation is syntactically impossible. B&S claim that the distinction between V-movement, which is dependent on ellipsis, and the obligatory object movement would follow in a theory assuming that Object raising is a syntactic operation, while both V-movement and VP-ellipsis are PF operations. The feature driven movement of the object would not be affected by ellipsis or V-raising, but the PF-requirement to

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[5] Assuming, following Chomsky 1995, that syntactic movement is movement of abstract features and not the actual lexemes.

raise the verb could be canceled, once the verb no longer exists in PF. The interdependence between verb movement and VP-ellipsis falls out naturally under the assumption that they are both PF operations, providing evidence for a PF-analysis of V-movement.

2.1.3.2   Problems with PF V-Movement

The problem with B&S proposal is that they don't offer a fully-fledged theory of movement in PF. Even if it is agreed that a V-movement at PF has a better chance to cover the facts of pseudogapping, it is still necessary to see what motivates this movement in order to verify that the required paradigm is obtained. B&S acknowledge this shortcoming and state that the motivations for PF movement are to come from morphology and prosody, citing several works in this area (e.g., Neeleman and Reinhart 1998). However, it remains to be seen whether any of the proposed PF models can derive the pseudogapping paradigm better than a theory assuming a syntactic V movement[6].

2.1.3.3   V-movement in PF and the Wijler Sentences

The main advantage of head movement in PF for the Wijler sentences is that it is easier to envision an optional PF movement than an optional syntactic movement (though the latter is also possible, according to Neeleman and Reinhart 1998, Chomsky 2001 and Reinhart 2006). The question is what licenses head movement in Wijler sentences, and consequently the predictions concerning its distribution. One could claim (along the lines of Holmberg 1999) that a PF-movement can be motivated by the need to arrive at the semantic impact of these configurations. In a response to Holmberg 1999, Chomsky argues that semantics cannot motivate phonological operations, since PF does not have access to the semantic outcome. Furthermore, this kind of theory becomes less feasible considering the fact that the semantic impact of Wijler sentences involves the argument and the adverb, and the verb does not change its interpretation at all. The interpretation of the argument cannot directly motivate a PF-movement of the verb. Even if a PF V-movement could be motivated for the Wijler sentences, it would not account for the

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[6] For example, Neeleman and Reinhart 1998, do not suggest any possible motivation for PF movement, only for PF effect on filtering out of structures generated by the computational system.

semantic restrictions (e.g., the existential entailment with negation) There is nothing in models of word order, PF and discourse (Zubizaretta 1998, Reinhart 2006) to predict that an adverb should change its semantic interpretation because the verb was raised. Moreover, these theories could not predict the specific discourse restrictions on Wijler sentences, because they invlove something besides focus and association (e.g., #*he ate davka an <u>apple</u>* vs. *he ate davka a candy*).

2.1.4 Syntactic and PF V-movement - Conclusions

The conclusion of this discussion is that V-movement cannot account for the akternation between Wijler sentences and Infl sentences independent of the module in which it applies (narrow syntax or PF).

I remain neutral about the hypothesis that it should be a PF operation, but crucially, the adverbs in Wijler sentences cannot be used as evidence for V-movement. In the following section, syntactic theories concerning optional alternations involving discourse considerations a semantic impact are discussed.

2.2 Narrow Syntax, Discourse Dependence and Optionality - (Chomsky 2001, Bobalijk 2002, Horvath 2009)

Chomsky 1995 argues that Universal Grammar is restricted by the *Inclusiveness Condition*. The *Inclusiveness Condition* determines that the syntactic derivations do not involve elements that do not exist in the lexicon, i.e., only formal features on functional heads or lexical properties can affect syntactic derivations. Reinhart 2006 argues that discourse entities such as 'focus' or 'contrast' cannot be encoded as formal syntactic features. Her reasoning is that the contextual information necessary to determine whether something is a 'focus', 'a contrast' etc. cannot be encoded in the lexicon. The implication of the 'Inclusiveness Condition' is that any affect of a discourse element on the outcome of a syntactic derivation must be mediated through the interface.

2.2.1. The Strong Modularity Hypothesis – (Horvath 2009)

Horvath 2009 discusses the nature of the relations between the computational system (Narrow Syntax), and discourse entities. Assuming Chomsky 1995 Inclusiveness Condition, and following Reinhart 2006 Interface Strategies, Horvath proposes the 'Strong Modularity Hypothesis', cited below (p.7):

(25) *The Strong Modularity Hypothesis for Discourse-features: No information structure notions, i.e., purely discourse-related notions – can be encoded in the grammar as formal features; hence no "discourse-related features" are involved in the syntactic derivation. They are available only outside the Computational system.*

Focus movement in Hungarian has been one of the strongest arguments for encoding focus as formal syntactic feature, in violation of the Strong Modularity Hypothesis. It shows the effects of a narrow syntax movement, and it is argued to be motivated by the discourse entity of focus. Horvath takes this case as a test case for the Strong Modularity Hypothesis, and proposes an account for the attested syntactic movement, with no reference focus.

Hungarian manifests a long distance movement of focus elements to a designated position. There is a diagnostic for syntactic movement in Hungarian since it affects the relative order of verbs and verb particles.

When there is no movement the verb particles precede the verb, and when movement has occurred, they follow it (all the Hungarian examples are taken from Horvath 2009, accent is marked with boldface).

(26) a Bemutatam Jánost az unokahúgomnak
in-showed-1SG János-ACC the niece-my-DAT
(I introduced John to my niece)

b Q: Kinek mutattad be Jánost
To whom did you introduce János

A: [**az unokahúgomnak**] mutattan be Jánost
The niece-my-DAT showed-1SG in János-ACC
(I introduced János to **my niece)**

In (26a) there was no syntactic movement and the particle *be* 'in', precedes the verb, but in both question and answer in (26b) there was syntactic movement and the particle

follows the verb. The moved DP is necessarily the focus of the sentence, as can be observed from the accent, and from the fact that it is the answer of the context question. Horvath provides evidence that the Hungarian "Focus movement" [7] is a syntactic movement; it is cyclic, it obeys syntactic islands (e.g., CNPC), and its landing position is a fixed syntactic position. Since "Focus movement" invariably targets focus phrases, it was reasonable to assume that there is a focus feature motivating it, but this is not a possible analysis, under the Strong Modularity Hypothesis.

Horvath argues that the Hungarian "Focus movement" is not motivated by the discourse entity 'Focus', but rather by an Exhaustivity operator, which is independent of discourse considerations, and is encoded as a formal feature on a functional head. The fact that there are focus phrases in Hungarian that cannot undergo the alleged "Focus movement" lends support for this claim.

(27) Q: Kinek mutattad be Jánost
          To whom did you introduce János

      A: Tegnap este **Marinak** mutattam be Jánost
          Last night   Mary-DAT introduced-1SG in János-ACC
          (Last night I introduced János to **Mary**)

      B: Tegnap este be-mutattam Jánost **Marinak**
          Last night in-introduced-1SG János-ACC Mary-DAT
          (Last night I introduced János to **Mary**)

The focus in (27A) was moved, so the particle *be* 'in' follows the verb, but in (27B) focus was not moved, and the particle precedes the verb. Assuming that focus motivates the attested movement, we would wrongly predict the foci in both case to undergo movement.

As pointed out in earlier work (Kenesei 1986, É. Kiss 1998, Horvath 1997, 2000), the focus in (17A) and (27B) differs in its semantic-pragmatic effects. In order to explain the difference between (27A) and (27B) we need to refer to theories of the semantics of focus. It is generally assumed (at least since Jackendoff 1972) that focus marks the new or non-presupposed information in the sentence, and therefore it can be identified as the answer to a question. Rooth 1992 offered a theory of the semantics of Focus, in which he

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[7] Since the question addressed by Horvath is whether or not the attested movement is motivated by focus, I follow her, and refer to it as "Focus movement" in inverted commas.

claimed that in addition to the ordinary semantic value, every sentence has a *focus semantic value*. The focus semantic value is a set of alternatives, obtained by replacing the focus phrase with a variable, and assigning it values of same semantic type, as in (28).

(28) Last night I introduced John to **Mary**

Obtaining the Focus semantic value of (28):

(a) Replacing the focus with a variable: Last night I introduced John to x, i.e., there is an x such that: last night I introduced John to x.

(b) Assigning different values to the variable, and assembling the resulting alternatives in a set (the curly brackets indicate a set): {Last night I introduced John to Lucie; Last night I introduced John to Sara; Last night I i ntroduced John to Josef…}

The distinction between the two kinds of focus in (27a) and (27b) is that the sentence with the moved focus asserts that all alternatives except for the one corresponding the ordinary semantic value of the sentence are false, i.e., (27a) is the only true answer to the question: 'To whom did you introduce John to last night', and there is no such implication for the non-moved focus. Horvath argues that the moved focus performs exhaustive identification by exclusion, thus identifying the sentence as the only true answer, by necessarily falsifying any possible alternative. The non-moved focus (27B), on the other hand, gives rise to the same set of alternatives and chooses the asserted sentence as a true answer, but it does not imply that other alternatives are necessarily false.

(29) (Context Q: Who did they call up?)

Speaker A: **Jánost** hítvák fel
John-ACC called-3PL up
(They called up **John)**

Speaker B: Nem igaz. **Marit** is fel-hítvák
Not true. Mary-ACC also up-called-3PL
Not true. They also called up **Mary**

Speaker C: #(Igen). És (fel- hítvák) **Marit** is
(Yes). And up-called Mary-ACC also
Yes and (they-called-up) also **Mary**

The contrast in acceptability between the responses of speaker A and speaker B in (33) shows that the moved focus implies exclusion of all other alternatives, and in order to introduce a new true alternative, the speaker must negate the exhaustivity assertion of the sentence. Focus in situ is like intonational focus in English or Hebrew, where there is a no explicit implication of exhaustion, and adding a true alternative does not require the use of negation.

(30)   (Context Q: Who did they call up?)
       Speaker A: They called up **John**
       Speaker B: #No you're wrong they also called up **Mary**
       Speaker C: Yes, and they also called up **Mary**

Horvath provides further evidence that Exhaustive Identification determines the interpretation of the syntactic "Focus movement".

(31)   Q: Kiket hivott már meg Anna
           Who-PL-ACC invited-3SG already PERF. particle Anna
           (Who has Anna (already) invited?)

       A: (Valózínüleg) meg-hívta **Katit és Pétert**,
           (probably) PERF.particle-invited-3SG Cathy-ACC and Peter ACC

           és talán **Marit** is and perhaps Mary-ACC also
           (Probably) she invited **Cathy** and **Peter** and perhaps also **Mary**

In (31) the sentence is used to convey a non-exhaustive answer to the question, it is therefore compatible with the non-moved focus. The moved exhaustive focus would contradict the modal adverbs *probably*, and *perhaps*, asserting that the chosen alternatives are all necessarily true.

Another evidence for the claim that Hungarian "Focus Movement" is motivated by exhaustivity, and not by focus is that while the focus argument associated with *csak* 'only' undergoes "Focus movement", the focus argument associated with *még* 'even' cannot be moved. This is predicted by Horvath Exhaustive Identification analysis, because *only* is explicitly exhaustive, but *even* is not, but it is not predicted by a theory in which the movement is motivated by the focus.

(32) a   Mari csak **a fogadásról** késett el
        Mari-NOM   only the-reception-from late-was away
        (Mary was late only for **the reception**)

     b   *Mari elkésett csak **a fogadásról**
        Mari-NOM   away-was-late only the-reception-from

     c   *Mari csak **a fogadásról** elkésett
        Mari-NOM   only the-reception-from away-was-late

     d   *Mari csak   elkésett **a fogadásról**
        Mari-NOM   only away-was-late the-reception-from

(33) a   Mari elkésett még **az esküvőjéről** is
        Mari-NOM away-late-was the wedding-her-from also
        (Mari was late even for **her wedding**)

     b   Mari még **az esküvőjéről** iselkésett
        Mari-NOM the wedding-her-from also away-late-was
        (Mari was late even for **her wedding**)

     c   *Mari még   **az esküvőjéről** is késett el
        Mari-NOM the wedding-her-from also late-was   away

Both *only* and *even* associate with focus, i.e., they must have a focus phrase in their domain and they are semantically associated with it. Assuming that the Hungarian "Focus movement" is motivated by a focus feature, would make the wrong prediction that the associates of *only* and *even* must be equally moved. Horvath argues that the operator inducing "Focus movement" is not Focus, which is a discourse entity, but an **Exhaustive Identification** (EI) operator. The EI operator is independent of context, and therefore could be inserted in the syntax, with no violation of the Strong Modularity Hypothesis. Horvath claims that there is an Exhaustive Identification (EI) (invisible) functional head, which carries an uninterpretable EI feature and an EPP feature.

The EPP forces overt movement to EI, and the EI features determine the semantics of exhaustive identification for the moved element.

This way Horvath derives movement of the exhaustively identified phrases in much the same way as the WH and EPP features derive WH-movement.

In order to account for the fact that only foci undergo EI movement, claiming that the EI head must associate with focus in much the same way as *only*. In sum, Horvath shows that what seemed to be a syntactic movement induced by contextual considerations

(focus), is induced by a truth-conditional operator, thus providing indirect support for the Strong Modularity Hypothesis.

2.2.1.2   Strong Modularity Hypothesis and the Wijler Sentences

Horvath states some characteristic properties of syntactic movements and focus accommodating non-syntactic movements, thus distinguishing between the syntactic EI movement in Hungarian, and cases of optional linear order correlating with discourse focus. Zubizaretta 1998 discusses a case of focus accommodating movement in Spanish, where the focus element must show up at the end of the sentence, which is the position most appropriate for sentence accent.

(34)   (Context Q: Who ate an apple?)

    a   ***Juan** comió una manzana
       Juan ate an apple   (Possible in a contrastive reading)

    b   Comió una manzana **Juan**
       Ate an apple Juan
       (**Juan** ate an apple)

Zubizaretta 1998 argues that the focus element is moved for prosodic reasons; it requires sentence stress in order to be interpreted as focus, and sentence stress is assigned at the right edge of the sentence. According to Horvath 2009, Reinhart 2006 and Neeleman and Reinhart 1998, this would have to be achieved indirectly, such that the structure would be achieved for independent reasons, and used by the speaker as a means to facilitate stress assignment to the subject. Focus accommodating movements are maximally local (they cannot occur over a clause boundary), and constituents are not moved in order to be interpreted as focus; rather other constituents are removed from the stress assignment domain in order to facilitate stress assignment of the focus constituent. Crucially, the alternation between Wijler sentences and Infl sentences could not be motivated by the need to facilitate the assignment of sentence stress. There are various rules for the assignment of sentence stress in the literature (Cinque 1993, Zubizaretta 1998, Szendrői 2001 and others), however they all predict sentence stress either on the most deeply embedded element or on the right edge of the sentence. The object fulfills either of these requirements in either the Wijler sentences or Infl sentences. Well, one could argue that

there is a motivation for the adverb to be accented as well, and this is done only in Wjler sentences. I see no reason why this should be the case, and in fact adverbs may be accented in Infl as well

The crucial implication of Horvath 2009 to the issue of Wijler sentences lies in the 'Strong Modularity Hypothesis'; taking the it as a guideline implies that the alternation is not brought about by a syntactic movement operation.

2.2.2 Icelandic Object Shift: Optionality, Discourse Dependence and Linear Adjacency - (Chomsky 2001, Bobalijk 2002)

The case of object shift (henceforth OS) in Scandinavian languages, and specifically in Icelandic received much attention in the literature (Holmberg 1986 and subsequent studies). Holmberg 1986, 1999 showed that Icelandic OS is optional, and it depends on discourse considerations; the shifted order is possible only with non-foci arguments.

The following examples are from Erteschik-Shir 2005.

Furthermore Holmberg shows that Icelandic OS requires the verb movement as a precondition.

(36) a   Jón las bókina ekki (Icelandic)
         Jón read the-books not

     b   Jón las ekki bókina
         Jón read not the books

In (36) both the OS order (36a), and the non-OS order (36b) grammatically show optionality. In (36a) the object has undergone OS and it must be interpreted as non-focus, while in (36b) the object is the focus of the sentence, and must remain in situ. Another property of Scandinavian OS is the variation in Scandinavian languages; we have seen that Icelandic allows OS with full DPs, but this is impossible in mainland Scandinavian and Faroese (in which OS is obligatory).

(37) a   Peter mødte ikke Sara
         Peter met not Sara
         (Peter did not meet Sara)

b   *Peter mødte Sara ikke
Peter met Sara not
(Peter did not meet Sara)

The contrast between (37a) and (37b) shows that in Danish only object pronouns shift and Full DPs do not. Holmberg 1999, revising his previous work (Holmberg 1986), claims that Scandinavian OS is a phonological operation triggered by the semantic [−FOC] properties of the shifted object. Chomsky 2001 argues that both PF and LF are cyclic, implying that they operate simultaneously. The only effect that PF has on LF is in the deletion of unpronounced elements like traces and the removal of uninterpretable features.

(38)   *Chomsky 2001 (his 13: p. 15): Surface semantic effects are restricted to narrow syntax*

The implication of this claim is that the semantic effect cannot motivate the phonological rule, and Holmberg's PF account is untenable. Chomsky therefore proposes a narrow syntax account for OS.

2.2.2.1   Deriving Icelandic OS in Narrow Syntax – (Chomsky 2001)

The main goals of Chomsky 2001 OS theory are to explain the dependence on V-movement, and the dependence on discourse properties. In addition Chomsky aims to account for the distinction between OS and non-OS languages (Scandinavian, vs. English). Chomsky argues against a claim that the semantic property of the shifted object motivates its syntactic movement, based on the Inclusiveness Condition (Chomsky 1995). The Inclusiveness Condition determines that a syntactic derivation manipulates only elements already present in the lexical items selected from the numeration. Chomsky argues that the semantic property [-FOC] characterizes the landing site of the shifted object, and not the actual objects. In order to account for the fact that the semantics associated with the position has an affect on the syntactic movement operation, Chomsky relies on a condition on optional syntactic operations.

(39)   *Condition on Optionality in Narrow Syntax* (Chomsky 2001, p.34, his 60):
Optional operations can apply only if they have an effect on the outcome.

The idea behind this condition is that optional operations are more costly, and are therefore performed only when the derivation could not fulfill its role in the interface without them (see Reinhart 2006 for discussion).

In order to present Chomsky's OS theory let us start with some assumptions:

a. Spell-out of a phase takes place at the next strong phase; for our purposes, it is crucial that PF spell-out of vP takes place at the CP level, which is the next strong phase.

b. The Minimal Link Condition (MLC) is evaluated at the next strong phase (again, vP is evaluated at CP).

c. The Phonological border of HP (the maximal projection of a head H) is a position that is not c-commanded by any phonological material within HP.

The essential components of Chomsky's theory of OS are presented in (40) below (quoted from Chomsky 2001, his (61): p. 35):

(40) *Chomsky 2001 analysis of Object Shift*:
   a. v* is assigned an EPP-feature only if it has an effect on the outcome
   b. The EPP position is assigned Int
   c. At the phonological border of v*P, XP is assigned Int'

Int is an interpretation property, which is analogous to a semantic FOCUS, and Int' is an interpretation property, which is analogous to non-FOCUS.

The following illustrates the OS syntactic derivation according to Chomsky[8]:

- The subject is raised to the edge of v*
   [$_α$ Subj v* [$_{VP}$ V Obj]]
- The subject is raised to the EPP feature in Spec-T.
   [Subj T …[$_α$ t$_{Subj}$ v* [$_{VP}$ V Obj]]
- The verb is fronted to T.
   [SubjT [V …[$_α$ t$_{Subj}$ v* [$_{VP}$ t$_V$ Obj]]

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[8] I present the procedure in points, for presentational purposes, there is no ordering involved.

- PF spell-out takes place and Obj results in the phonological border of vP. The object is assigned Int' (Focus) in accordance with (40c).

If the object is compatible with Int', then the optional EPP feature of v is not inserted, and there is no object shift. If the object is incompatible with Int', the result of the derivation would be semantically deviant, and this motivates the insertion of an EPP feature to v^* yielding v^*P.

[SubjT [V …[$_\alpha$ XP [t$_{Subj}$ v^* [$_{VP}$ t$_V$ Obj]]]]]

- The object is moved to the edge of v^*P, where it is assigned Int (-FOC) according to (44b).
  [SubjT [V …[$_\alpha$ XP Obj [t$_{Subj}$ v^* [$_{VP}$ t$_V$ t$_{Obj}$]]]]]
- The whole thing is evaluated at the next strong phase β (CP).
  [$_\beta$ C [SubjT [V …[$_\alpha$ XP Obj [t$_{Subj}$ v^* [$_{VP}$ t$_V$ t$_{Obj}$]]]]]]

If the verb was not moved, due to a filled head position on its path (auxiliary verb or subordinate COMP), then it occupies the phonological border of v^*. In this case there is no XP at the phonological border, Int' is not assigned, and Int and Int' (Focus and non-Focus) can both be assigned to the object in situ. The parameter distinguishing non-OS (e.g., English) from OS languages involves (40c). English does not observe (40c), and therefore there is no motivation for the optional EPP feature of v^*, and OS. The English object can be assigned Int or Int' in its base position, as is the case of non-shifted objects in Scandinavian languages.

In conclusion, Chomsky offers a syntactic account for the optional OS, without including a direct restriction on Verb movement and without assuming that discourse considerations directly determine syntactic operations. This is possible due to the assumption that each phase is assigned semantic interpretation and PF-representation by the next strong phase. In the beginning of this chapter the idea was discussed that V-movement is not part of narrow syntax, but if Chomsky's OS theory is correct, then it must be assumed that at least V to T movement applies in the syntax, since otherwise we could not account for the identification of the 'phonological border' for the purpose of Int'.

2.2.2.2   Problems with Chomsky's Theory of OS

Chomsky 2001 employs the idea that each phase is evaluated at the next strong phase in order to account for the interference of phonological and semantic information in the course of the derivation. The derivation requires the knowledge of whether or not the object can be used as focus, in order to know whether the v*-EPP and Int are required. This poses no problem when the objects are definite pronouns, since they can be uniformly identified as incompatible with Int'. The problem is that definite DPs are allowed either in the shifted or in the basic positions, depending on the context (as in 40 above). When contextual information defines the definite object as focus, then it is found in its base position, but when it is not the focus, it must shift. There is no way in which this contextual knowledge can be accessible with the merger of C, where this information becomes relevant to the derivation. It involves previous discourse, and assumptions of the interlocutors. Of course, this depends on the way in which the interface is defined; one could argue that discourse properties are available at every phase boundary, but this requires a theory of semantic FOCUS that would apply at every phase.

2.2.2.3   Chomsky's Theory of OS and Wijler Sentences

In principle, Chomsky's innovation enabling an account of the semantic impact of OS could be used to account for the alternation we discuss. The problem is that if the configuration is a result of syntactic movement, then it must be verb movement. Since the semantic impact is associated with the adverb and the object, there is no way that restrictions on semantic interpretation (e.g., the existential entailment of negation) could motivate verb movement. It could be assumed that V to T movement was obligatory in Hebrew, and that the border of v* was assigned Int' = Focus (as in the case of Icelandic), forcing the adverb to raise when it associates with the focus.
The problem with that hypothesis is that not every case of focus association licenses the configuration.

CONTEXT: Ziva saw Ben eating an apple, but his mother who was not there, thinks that he ate a candy instead, and she is upset about it.

(41) a lama at do'eget, hu davka axal <u>tapuax</u>
Why are you worried? He DAVKA ate an apple

    b #lama at do'eget, hu axal davka <u>tapuax</u>
Why are you worried? He ate DAVKA an apple

The context in (41) licenses focus on *an apple*, which is normally accented as well. Nevertheless, the same contex does not license the Wijler sentence.

2.2.3. Another Theory Deriving OS in Syntax - (Bobalijk 2002)

Bobalijlk 2002 proposes another narrow syntax account of Icelandic OS, attributing the dependence of V-fronting and the semantic impact of using a different device. His theory is based on Chomsky 1993 Copy theory, in which movement creates a chain of copies, and at LF and PF only one copy can be interpreted. In Chomsky 1993 the decision of the position interpreted at PF is determined by the relative strength of the features, and in LF the interpreted copy is determined, based on semantic considerations.
This accounts for the phenomenon of inverse scope; LF can choose either the lowest or the highest copies of QR, and if it chooses the higher copy, then the PF determines whether movement was "overt", i.e., the higher copy is pronounced or "covert", in which case the lower copy is pronounced. Bobalijk assumes a model in which the derivation is sent simultaneously to the LF and PF, and each interface determines a privileged copy; in LF, it is the copy that will be semantically interpreted, and in PF it is the copy that will be pronounced. This accounts for the cases of "overt" movement in which the higher copy is interpreted both by LF and by PF, and "covert" movement, in which the higher copy is interpreted at LF, and the lower one at PF.
Bobalijk's model has an advantage in a case where the choice of the pronounced privileged copy is affected by PF-considerations (other than featural relative strength), and claims that the Icelandic OS is such a case. Bobalijk derives the necessary V-movement from a requirement of adjacency between the verb and Infl. He analyzes OS as an obligatory syntactic movement of the object to the specifier of Agr_oP. Bobalijlk argues that there is a requirement for an adjacency between the verb and Infl., which he motivates based on *the split morphology* model (Marantz 1982 an subsequent studies), in

which AGREEMENT and TENSE morphemes are assigned on the verb in the move between the syntax and PF (as in Lasnik 1999 for English lexical verbs in Section 2.1.2.1. above). This implies that the syntax is responsible for ensuing that the verb and the verbal morphemes are adjacent to one another, when the derivation is sent to PF, in order to prevent stranded morphemes. As a result, the higher copy of OS cannot be pronounced when it disrupts the adjacency between the verb and Infl., as is illustrated by the Icelandic contrast in (42).

(42) a *Risarnir ættu [$_{PartP}$ að [$_{AgroP}$ ríkisstjornirnar$_i$ [$_{VP}$ éta t$_i$]]]
        giants-the ought [$_{PartP}$ to [$_{AgroP}$ govement-the [$_{VP}$ eat t]]]
        The giants ought to eat the governments

    b Risarnir ættu [$_{PartP}$ að [$_{AgroP}$ [$_{VP}$ éta ríkisstjornirnar]]]
       giants-the ought [$_{PartP}$ to [$_{AgroP}$ [$_{VP}$ govement-the eat]]]
       The giants ought to eat the governments

According to Bobalijk, the reason for the contrast is that the verb *éta* 'eat' must be phonologically adjacent to the Infl particle *að* 'to', and (42a) is not a legitimate PF object because the shifted object *ríkisstjornirnar* 'the-government' intervenes between them. This implies that the higher copy of the moved object cannot be PF-privileged, unless the verb has left the VP to a higher position than Spec Agr$_o$, in which case the object does not disrupt the PF continuity. In order for this syntax-PF system to work, Bobalijk must account for the fact that adverbs do not disrupt the 'adjacency' between Infl. and the verb (e.g., as in the Icelandic '*Jon read not the book*', in 40b above). He links this fact to a similar contrast in the case of English 'DO-support'. Assuming that 'DO' is inserted in order to ensure adjacency between a verb and its morphemes (as in Lasnik 1999), we would have to account for the fact that it is needed when negation is the intervener, but not when adverbs intervene.

(43) a   Dan always fixes cars

     b   *Dan does always fix cars

(44) a   *Dan not fixes cars

     b   Dan does not fix cars

Example (44) shows that adverbs like *always* do not disrupt PF adjacency between the verb and Infl. In order to account for the special status of adverbs in both OS and 'DO' insertion, Bobalijk proposes a linearization procedure in which precedence relations are determined by c-command. He then argues that adverbs are syntactically adjoined, and that adjuncts do not introduce a c-command distinction. Bobalijk claims that adverbs (syntactic adjuncts) could in principle be analyzed as c-commanding or c-commanded by the modified XP, because they are segments of the XP level. Based on the adjunctt argument distinction, Bobalijk argues that adverbs are inserted and linearized later in the derivation, without disrupting the morphological operation. This theory accounts for the contrasts in (43-44) and for the fact that adverbs can show up between Infl. and the verb in Icelandic. Thus Bobalijlk 2002 accounts for the V-movement pre-condition, without assuming that linear adjacency directly affects the syntax.

In order to account for the [-FOC] restriction on OS arguments, Bobalijk, following Bobalijk 1994 and Bobalijk 2002, assumes an economy principle, which determines that a derivation in which the privileged copies of LF and PF show up in the same position ("overt movement") is more economical than a mismatched derivation ("covert movement")[9].

> (45) *Minimize Mismatch: (Bobalijk 2002, his 70, p. 251): (To the extent possible) privilege the same copy at LF and PF*

The implication of (45) is that when there are two alternative derivations, the matching derivation is preferred, based on economy. In addition, Bobalijk assumes the Diesing 1992 generalization that an object pronounced within the VP indicates new information ([+FOC], and in higher positions it indicates old, or given information[10]. Assuming that old vs. new information is coded at LF, Bobalijk predicts that [-FOC] objects are LF-interpreted in the higher position, and (45) determines that they are also pronounced there, provided of course that there are no other PF considerations excluding this option. [+FOC] objects are interpreted at the lower position, and (45) determines that they are also pronounced in there. To sum up, Bobalijk establishes the dependency of OS on verb

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[9] This is the reverse of Chomsky's 1995 argument that covert movements are more economical.
[10] This is the same generalization as the one in Chomsky's Int and Int'.

movement based on a PF–morphology requirement of linear adjacency between the verb and Infl. He explains the dependence on [-FOC], based on Diesing's 1992 association of VP-internal positions with [+FOC] and VP-external with [-FOC], and his Minimize Mismatch economy principle.

2.2.3.1   Problems with Bobalijlk's 2002 Syntactic Theory of OS

There is an empirical problem with Bobalijlk's account of the fact that adverbs do not disrupt PF adjacency. His argument is that adverbs are inserted late in the derivation, and therefore they do not interfere with PF-adjacency requirements. This analysis wrongly predicts that adverbs should not disrupt the adjacency required with English accusative Case (Stowel 1981, Neeleman and Reinhart 1998 among others).

(46) a *Max reads often books

     b Max reads often to his children

Neeleman and Reinhart 1998 argue that the reason for the grammaticality contrast between (46a) and (46b) is that Case checking requires linear adjacency in English. In (46a), the adjacency is disrupted by the adverb, and the sentence is ungrammatical, while in (46b) Case is checked by the prepositional head, adjacency is not disrupted and the adverb following the verb does not present a problem.

Assuming Bobalijk's theory of late insertion of adverbs, we would wrongly predict that adverbs should not disrupt the adjacency necessary for Case checking.

2.2.3.2   Bobalijk's 2002 OS Theory and Wijler Sentences

Bobalijk has worked out a strong interface tool to account for what seems to be an optional syntactic operation, dependent on discourse. This tool cannot account for similar properties in the alternation under discussion. The only candidate for a syntactic operation is verb movement. Bobalijk's model could be used to account for the optionality of the alternation, assuming that the chain of head movement consisted of copies, but it would fail to account for the semantic restrictions on the interpretation of the adverb.

2.3. Conclusions

In this chapter I have considered possible hypotheses that the alternation between Wijler sentences and Infl sentences is a result of a syntactic movement. I discussed theories deriving Verb movement in syntax and in PF (Chomsky 1957, Pollock 1989, Chomsky 1991, Lasnik 1999, Boeckx & Stjepanovic 2001), as well as theories of involving discourse considerations and optionality in syntactic movement (Chomsky 2001, Bobalijk 2002, Horvath 2009), and showed that non of them could be used to account for this alternation.

Chapter 3: The Interface with PF

3.1 Introduction

In this chapter I raise a hypothesis that we could account for the alternation between Infl sentences and Wijler sentences, using theories of the interface between syntax and phonological representation (PF). I present theories that give a PF account for similar alternations.

The chapter will be constructed as follows: In 3.2, I present a brief sketch of theories of the prosodic organization in languages, including theories of prosodic phrasing (Selkirk 1986, 2000, Truckenbrodt 1999), and of the prosodic status of function words (Selkirk 1995). In 3.3, I discuss PF theories of Dutch scrambling and Icelandic object shift (Erteschik-Shir 1997, 2005, 2006, Neeleman and Reinhart 1998, Reinhart 2006). These phenomena share two properties with the alternation between Infl. sentences and Wijler sentences: they involve optional alternations dependent on contextual information. I will present these theories, and discuss some problematic aspects in them. I will then show that these models cannot account for the alternation under consideration here, both because the prosodic properties of Wijler sentence could not motivate a prosodic dislocation, and because theories of superficial dislocation could not be used to explain the restrictions on semantic interpretation of Wijler sentences. In section 3.4 I conclude.

3.2 Prosodic organization – a brief summary of current theories (Selkirk 1986, 2000, Truckenbrodt 1999)

Before proceeding in the presentation of prosodic phrasing we need to get acquainted with a few relevant terms. Language is assumed to be divided into prosodic units, which are combined to create larger prosodic units, starting with the minimal prosodic unit, which is the syllable, and moving up to the utterance (Selkirk 1986 and subsequent studies).

3.2.1   The state of the art – Selkirk 1986, 2000, Truckenbrodt 1999

(1)   *The Prosodic Hierarchy (Selkirk 1986)*:

      a. **Utterance (Utt)** - the minimal unit containing at least one IPh

      b. **Intonational Phrase (IPh)** - the minimal unit containing at least one PPh

      c. **Prosodic Phrase (PPh)**   - the minimal unit containing at least one PWd

      d. **Prosodic Word (PWd)** – the minimal unit containing at least one Ft

      e. **Foot (Ft)** – the minimal unit containing at least one stressed syllable

      f. **Syllable** – minimal prosodic unit

Selkirk 1986 argued that prosodic phrases are prosodic domains, which are dependent on syntactic structure, but are not equivalent to syntactic constituents. She discovered a prosodic phrasing rule, making use of the edges of maximal syntactic projections XPs. Selkirk's evidence came from a lengthening rule applying in Chi Mwi:ni, which was discovered and discussed by Kisseberth & Abasheikh 1974.

    Chi Mwi:ni lengthening rule targets certain vowels when they are in the penultimate or antepenultimate syllable, and these vowels are lengthened.

(2) a   ma:limu – teacher

     b   malimuwe – his teacher

In (2), we observe that when the syllable /ma/ is antepenultimate it is lengthened, and when it is farther from the end of the word it is not. In Chi Mwi:ni adjacent words sometimes count for the purpose of determining whether the syllable is or is not in a position that requires lengthening.

(3) kama: mp^{h}aka]$_{PPh}$ na: mp^{h}ana]$_{PPh}$
     like   a-cat   and a rat

The fact that lengthening applies to the syllable /*ma*/ of the first word /*kama*/ 'like' implies that the two syllables of the following DP *mp^{h}a.ka* 'a cat' are taken into account, otherwise the syllable is ultimate, and it is not predicted to lengthen, and the same holds for /*na*/ 'and' and /*mp^{h}ana*/ 'a rat'. Selkirk claimed that the Chi Mwi:ni lengthening rule applies in prosodic domains, which are obtained in the process of mapping syntactic

structures to prosody. They are determined by the syntactic information accessible to PF, which includes, according to Selkirk, the linearized words and the edges of maximal syntactic constituents. The rule that Selkirk proposed for the prosodic phrasing in Chi Mwi:ni is presented in (4) below.

(4) *Align XP right*:

Align the right edge of an XP with the right edge of a prosodic phrase (PPh). The effect of this rule can be illustrated in the prosodic phrasing of (3), in which the first PPh aligns with the DP *mpʰaka* 'a cat', and the second PPh boundary is aligned with the DP *mp*.

Subsequent cross-linguistic research of prosodic phrasing revealed a more complex picture, in which *align XP right* is one, but not the only constraint. Truckenbrodt 1999 presented two other constraints in prosodic phrasing based on data from Kimatuumbi and Chichewa. The constraint *Wrap XP*, determining that every XP must be "wrapped" in a PPh, holds in Kimatuumbi, and the constraint *Align Focus*, determining that the PPh boundary is aligned with focus, shows up in Chichewa. The three constraints have different predictions, for example a VP with two DP arguments would have a PPh boundary aligned with the edge of first argument DP in Chi Mwi:ni, using *align XP Right*, but after the second argument Kimatuumbi applying *wrap XP*, and in Chichewa respecting *align FOC*, phrase boundaries could appear after a focused verb. In order to account for the diversity Truckenbrodt 1999 and Selkirk 2000 assume Optimality Theory (OT) (Prince and Smolensky 1993, and subsequent studies), determining that each language ranks the constraints in a different way, and the highly ranked constraints are the ones that show up more frequently[11]. Selkirk 2000 offers a summary of the constraints on prosodic phrasing that have been cross-linguistically identified, by 2000.

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[11] When the effect of the high ranked constraints is muted because of independent factors, the language can show the effects of the lower constraints as well.

Selkirk (2000) – rules of prosodic phrasing:

<u>Syntax-based constraints</u>:

A.   Cohesion:

1.   Wrap XP (all arguments are wrapped in XP) (Truckenbrodt, 1999)*For example*: V-DP-PP]$_{PPh}$

B.   Demarcation:

1.   Align (XP$_R$, PPh$_R$) (Align every right edge of XP with a right edge of PPh) (Selkirk, 1986 and on).

For example: V-DP]$_{PPh}$DP]$_{PPh}$

2.   Align (Foc$_R$, PPh$_R$) (Align every right edge of a focused constituent with the right edge of PPh) (Selkirk, 2000)[12]

For example (assuming narrow focus on the verb): **V**]$_{PPh}$

<u>Prosody-based constraints</u>:

1.   PPh BIN: Every PPh contains exactly two PWds. (Revised from Ghini 1993 by Selkirk, 2000).
For example: Dan ate]$_{PPh}$ a sweet apple]$_{PPh}$

2.   Max BIN: Every PPh contains maximally two PWds. (Truckenbrodt and Sandalo, 2002)

For example: (a)   Subj]$_{PPh}$ – V- Object]$_{PPh}$
                  (b)   Subj]$_{PPh}$ – V]$_{PPh}$ - Object]$_{PPh}$
                  (c)   Subj V]$_{PPh}$ - Object]$_{PPh}$

As before, the constraints give rise to different prosodic phrasing. For example, a language like Kimatuumbi respecting *Wrap XP*, would allow PPh with a head and two XPs, but languages where *Max BIN* is ranked relatively high (e.g., Brazilian Portuguese) would tend to draw the boundary after two prosodic words. The implication of the prosodic phrasing research to the discussion of the Wijler sentences is that there is no universal rule regulating prosodic phrasing, and in order to identify prosodic boundaries

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[12] Personally, I would include the focus alignment constraint, either with the phonological constraints if it is derived by pitch accent, or in a separate section signaling discourse relation.

in a given language we must search for clues in the data. In the following paragraph I present Selkirk's (1995) theory of the prosodic status of functional words, which could be relevant to the prosodic organization of the adverbs in the Wijler sentences.

3.2.2   Functional Words (Selkirk 1995)

Selkirk 1995 claims that functional words are prosodically distinguishable, and that this fact helps the child acquiring a language to distinguish lexical from functional words. This claim is problematic, since there is no theory distinguishing clearly between functional and lexical words (e.g., the status of adverbs is unclear). I will therefore concentrate on her prosodic claim regarding the prosodic organization of unstressed words, and I will refer to 'prosodically weak words' rather then to 'function words'. Prosodically weak words have word-stress in isolation but they tend to loose it in phrases, and this affects the quality of the vowel.

(5) a for   [fɔr]   four

    b for   [fr]   for Timothy (cf. fertility)

(6) a can   [kᴂn]   (tin) can

    b can   [kən], [kn], [km] can pile (cf. compile)

Selkirk shows that when prosodically weak words are focused, they do not loose their accent, and their vowel quality remains intact.

(7) Bettina CAN speak but refuses to   [kᴂn]

Selkirk argues that weak elements do not lose their word-stress when they are focused, because pitch accent must align with word-stress. There are cross-linguistic variations in the behavior of prosodically weak words, but there are certain guidelines, which will be relevant to our discussion[13].

Some properties of prosodically weak words:

a. A prosodic word must contain a stressed syllable (Foot)

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[13] Selkirk introduces the behavior of English functional elements in detail, assigning it to universal constraints, and a certain ranking relevant in English, but these do not concern us here.

b. Words with no accented syllable must be prosodically incorporated into a prosodic word, in order to appear in the levels of the prosodic hierarchy (prosodic word, phrase etc.).

c. Only prosodic words are legitimate hosts for unaccented words.

3.2.3 Conclusion

I have briefly presented theories of cross-linguistic prosodic organization (Selkirk 1986, 2000, Truckenbrodt 1999), and showed that there is language variation in prosodic phrasing. I then presented Selkirk's analysis of the prosodic organization of unstressed words, determining that unstressed words must be incorporated with stressed words in order to be included in the prosodic hierarchy. In the next section I present PF theories of phenomena of optional ordering and contextual dependence.

3.3 Dutch Scrambling (Neeleman and Reinhart 1998, Reinhart 2006) and Icelandic Object Shift (Erteschik-Shir 1997, 2005, 2006)

In this section I discuss PF-theories for the phenomena of Dutch scrambling and Icelandic Object Shift. These alternations are similar to the one under discussion, in that they involve context dependent optionality in word order. I will present these theories and show that the prosodic properties of Wijler sentences make them inapplicable to our phenomenon, and that even if we could find an alternative prosodic motivation for the alternation, a superficial dislocation would fail to account for the restrictions on the semantic interpretation of Wijler sentences (e.g., the existential entailment on negation and almost).

3.3.1 Dutch Scrambling

In the following section we explore Neeleman and Reinhart's (1998) PF-based analysis of Dutch scrambling, illustrated in (8) below.

(8) a Dat Jan langzaam het boek las
       that Jan slowly the book read

  b Dat Jan het boek langzaam las
   that Jan the book slowly read

Dutch is an S-O-V language, and it allows its VP adverbs either preceding the VP (5a), or intervening between the verb and its argument (8b). Like the 'target paradigm', Dutch scrambling has an optional word order in which an adverb intervenes between the verb and its complement (e.g., (8b) and the Hebrew: *she wears always acc the same shirt*), and the choice of order is dependent on contextual considerations. This is illustrated in (9) and (10) below, where narrow focus on the verb licenses the 'scrambled' configuration, while it is less felicitous with non-scrambled structure, narrow focus on the object does not license the scrambled configuration, while it is compatible with the non-scrambled structure.

(9) Q: Hoe gaat het met de review van Jan's boek?
   How goes it with the review of Jan's book?

  A: Ik heb het boek eindelijk gelezen (narrow focus on the verb)
   I have the book finally read

  B: #Ik heb eindelijk het boek gelezen
   I have finally the book read

(10) Q: Heeft je buurman gisteren de deur geverfd?
   Has your neighbor yesterday the door painted?

   A: #Nee, hij heft het raam gisteren geverfd (Narrow focus on the object)
   No, he has the window yesterday painted

   B: Nee, hij heft gisteren het raam geverfd
   No, he has yesterday the window painted

The Wijler sentences also depend on contextual considerations, though we have not yet defined what they are (*#Ben at davka an _apple_* vs. *Ben davka ate an _apple_*, in a context and intonation supporting association with focus), and it induces specific discourse effects (e.g., the speaker's expectation inference: *Ben dances always with Lucy* implies that the speaker expected there to be events of him dancing with people other than Lucy). These similarities suggest that we might be able to use Neeleman and Reinhart's (1998) theory of scrambling in an explanation of our alternation.

3.3.1.1 Base-Generating Dutch Scrambling – Neeleman and Reinhart 1998, Reinhart 2006

The term 'scrambling' indicates a local variation of order in OV languages, resulting in two options: in one a VP-adverb precedes O-V (Sbj-Adv-Obj-V), and in another it intervenes between them (Sbj-Obj-Adv-V). The order in which the adverb intervenes between the object and the verb is commonly referred to as the 'scrambling' order (*that Jan the book slowly read*), assuming that object was raised syntactically, and the other order is assumed to be base-generated (*that Jan the slowly the book read*).

Neeleman and Reinhart 1998 (henceforth N&R) argue against theories that derive the 'scrambling' order using syntactic movement of the object, and suggest that both orders are base-generated, and that interface considerations determine which derivation surfaces. N&R cite Neeleman and Weerman 1996 who argued that there is a descriptive generalization such that 'scrambling' shows up in OV languages like Dutch, but not in VO languages like English. This is illustrated in (11) showing that English does not allow the scrambled order.

(11) a John slowly read the book
     b *John read slowly the book

According to N&R, the generalization includes all VO languages, which are predicted to ban 'scrambling', and all OV languages, predicted to allow scrambling (controlling for the effects of verb movement in VO languages)[14]. N&R argue that adverbs can be adjoined either to the verb or to the VP, and that V-adjunction can show up immediately preceding the verb, yielding the "scrambled" ordered. They claim that the scrambled order is base-generated, with the adverb merged to the left side of the verb, and the object merged above it to V'; the non-scrambled order is generated by merging the object to the left side of the verb, and merging the adverb above it to the left side of V', and that both these options are available in Universal Grammar. The two structures for (5a-b) are illustrated in (12a-b) below.

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[14] In the following section I will show that this generalization cannot be maintained, based on data from Hebrew.

(12) a Dat Jan [$_{VP}$ langzaam [$_{VP}$ het boek las]]
      that Jan slowly the book read

   b Dat Jan [$_{V'}$ het boek [$_V$ langzaam [$_V$ las]]]
      that Jan the book slowly read

N&R claim that the difference between English and Dutch originates in the requirement of Case checking. They cite Stowel (1981) for the descriptive generalization that English requires linear adjacency between the verb and its accusative complement. They explain the adjacency requirement, claiming that English Case is checked in a prosodic domain, where adjacency is crucial. This allows them to explain a contrast in English, such that a PP argument does not require adjacency with the verb, and consequently it allows the 'scrambled' order. The argument is that the verb checks accusative Case in a prosodic minimal domain, so adjacency is crucial, and in a PP argument the DP checks its Case with the preposition so the whole PP need not be adjacent to the verb[15]. Thus, according to N&R the adverb is (10b) is merged to the right of the verb, and the object is merged with V'.

(13) a *John read slowly the book

   b John [$_{V'}$ [$_V$ read [$_V$ slowly]] [$_{PP}$ to his children]]

Let us see how N&R derive the distinction between English and Dutch. They argue that Case checking applies at the interface between syntactic structures and phonological representations (PF), and it may therefore apply either in a syntactic or in a prosodic minimal domain.

(14) *Case checking*:

    V may enter into a checking relation with a Constituent C iff

      a V precedes/follows C, and

      b V and C are contained in the same local domain.

The syntactic minimal domain is defined by c-command, and it is not affected by the adverb adjoined to the verb. By contrast, the PF-minimal domain is the prosodic phrase, and linear intervention does affect the prosodic phrase. N&R predict that languages

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[15] The English scrambled order requires a special context, a point that we shall address in discussing problems with N&R theory.

checking accusative Case in the prosodic domain would not enable the 'scrambling' configuration and languages checking accusative Case in the C-command domain would enable 'scrambling'. N&R assume Selkirk's 1986 *align XP* $_{RIGHT}$ rule for prosodic phrasing (B(1): p. 5 above, repeated as (12) below).

(15)   *Align (XP$_R$, PPh$_R$)* (Selkirk, 1986):
        Align every right edge of XP with a right edge of PPh

Applying this rule to a VO language yields a prosodic phrasing in which the verb and the object are in one prosodic phrase, because the verb is an X^0, and it does not introduce a phrase boundary. However, applying it to OV languages yields two separate prosodic phrases, because the DP preceding introduces a prosodic phrase boundary, and the VP would introduce the following boundary. This implies that OV languages must check accusative Case in the c-command syntactic domain, and since c-command is not sensitive to linear adjacency, N&R correctly predict that they should enable the 'scrambling' configuration. According to N&R Case checking is a process applying in the mapping of syntactic structures to PF. They argue that the task of PF is to get the sentence to spell-out as soon as possible, and therefore PF-checking is more economical. Based on economy considerations, Case checking must apply at PF when possible. This implies that English must check its Case at PF, because its accusative arguments are always in a prosodic phrase with the preceding head (Align XP$_R$). An intervening AdvP in English, introduces a phrase boundary separating the argument from the verb, and consequently Case checking fails and the derivation is ruled out ((11b): **John read slowly the book*). VO languages on the other hand must check accusative Case in a c-command domain, and adjunction of AdvP to the verb does not alter the c-command relation between the verb and the object. VO languages are thus predicted not to allow a base-generated 'scrambling' configuration.

Dutch scrambling was reported to be possible only with strong DPs, i.e., definite arguments (De Hoop 1992). This poses a challenge to N&R's theory, because they

assume that the structure is based generated, and the distinctions between definite and indefinite DPs should not play a role in restricting a base generated structure[16].

(16) a Dat de politie gisteren taalkundigen opgepakt heft
That the police yesterday linguists arrested

    b *Dat de politie taalkundigen gisteren opgepakt heft
That the police linguists yesterday arrested

(17) *De Hoop 1992 Generalization*:

Only strong DPs can undergo scrambling (move leftward over adverbials).

According to De Hoop's 1992 generalization, the reason for the ungrammaticality of (16b) is that the object *taalkundigen* 'linguists' is not definite, and therefore scrambling is not possible. N&R show that (17) is not the correct descriptive generalization, providing contexts in which 'scrambling' is not favored, despite the fact that the arguments are definite (strong) DPs. In (18) below (repeated from (9) the strong DP *het boek* 'the book' is favored in the scrambled configuration as predicted by De Hoop's generalization, but in (16) (repeated from (10)) the object *het raam* 'the window' is also a definite DP, and yet it is infelicitous in the scrambled configuration.

(18) Q:Hoe gaat het met de review van Jan's boek?
How goes it with the review of Jan's book?

A:Ik heb het boek eindelijk gelezen   (narrow focus of the verb)
I have the book finally read

B: #Ik heb eindelijk het boek gelezen
I have finally the book read

(19) Q: Heeft je buurman gisteren de deur geverfd?
Has your neighbor yesterday the door painted?

A: #Nee, hij heft het raam gisteren geverfd
No, he has the window yesterday painted

B: Nee, hij heft gisteren het raam geverfd
No, he has yesterday the window painted

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[16] This fact was used by De Hoop 1992 and others to support a movement account to a functional head with a 'definiteness' abstract feature.

Based on data as in (19), N&R argue that the descriptive generalization underlying the contexts in which scrambling is preferred has to do with semantic focus.

Before we turn to N&R's theory of Dutch scrambling, we need to clarify their assumptions about sentence stress and semantic focus. N&R assume a version of the *Nuclear Stress Rule* (Reinhart 2006 adopts Szendrői's (2001) version, which is a development of Cinque's (1993) Nuclear Stress Rule (NSR)). The Nuclear Stress Rule assigns main sentence stress to the most deeply embedded element in the sentence. In addition N&R assume as in Reinhart 2006, that sentence stress determines the possible Foci of a given derivation. Sentence stress generates a focus set containing all and only the foci, for which the sentence with the stress assigned by NSR can be used.

(20) *The focus set (Reinhart 2006)*:
The focus set of a derivation D includes all and only the constituents containing the main stress of D.

Applying (20) to IP, with a transitive verb, as in (21a) yields the focus set as in (21b), and the same applies to Dutch (22a-b), though because Dutch has a reversal direction of embedding, the stressed object precedes the verb, as in (19a):

(21) a [$_{IP}$ Subject [$_{VP}$ V [$_{DP}$ Object]]]
    b *Focus set*: DP, VP, IP
(22) a [$_{IP}$ Subject [$_{VP}$ [$_{DP}$ Object] V]]
    b *Focus set*: DP, VP, IP

According to Neeleman and Reinhart 1998, Reinhart 2006, the focus is chosen from the focus set according to discourse considerations as in (23-25) below (I mark sentence stress with capital letters, and the semantic focus with square brackets and the subscript F).

(23) Q: Why are you so happy?
    A: [$_{IP}$ Max bought a DOG]$_F$
(24) Q: What did Max do?
    A: He [$_{VP}$ bought a DOG]$_F$

(25) Q: What did Max buy?

A: He bought [$_{DP}$ a DOG]$_F$

In addition, N&R assume two context dependent stress rules that can affect the outcome of the Nuclear Stress Rule (NSR): an *anaphoric destressing* rule, and a main *stress shift* rule. Leaving the technical details aside, *anaphoric destressing* ensures that an element, which has been mentioned in previous discourse, will not carry main stress, and *main stress shift* assigns sentence stress to an element, not contained in the focus set of the derivation. Stress-changing operations are uneconomical, and used only when the focus set derived by the *NSR* fails to meet the requirements of the context. For example if there is a question: '*Who kissed Mary?',* then a possible answer is '*[John]$_F$ kissed Mary'*, but since the subject DP is not in the focus set of the sentence, it would require a *main stress shift* operation, assigning main stress to the subject. Similarly, if the question is '*why did you invite John$_i$ to your party?'* and the answer is '*I love him$_i$'* then the anaphoric pronoun *him* would have to be destressed, and the verb would be assigned main stress. Bearing this in mind, we can now turn to N&R's account for the dependence of Dutch scrambling on contextual information.

N&R's theory of the base-generated 'scrambling' implies two distinct structures, and each of these structures induces a distinct focus set, as is illustrated in (44) below

(26) A: *Non-Scrambled*:

a Syntax: [$_{V'}$ AdvP [$_{V'}$ **DP** V]]

b Focus set: {IP, VP, DP$_{obj}$}

c Object DP: Stressed

B: *Scrambled*:

a Syntax: [$_{V'}$ DP [$_{V'}$ AdvP **V**]]

b Focus set: {IP, VP, V}

c Object DP: destressed

The difference is that in the scrambled structure (26B) the *verb* is a member of the focus set, but not in the non-scrambled structure, while, the *object* is a member of the focus set of the non-scrambled structure (26A), but not of the scrambled structure. N&R argue that

based on economy considerations, the scrambled structure is preferred in contexts where the verb is interpreted with narrow focus; in the unscrambled structure, this interpretation requires the uneconomical *stress shift* rule, but in the scrambled structure it is achieved directly by the NSR. Their claim is supported by the contrasts in (18) and (19), where the scrambled order is favored only when the verb is assigned narrow focus, and it is infelicitous in contexts where the object is assigned narrow focus. N&R tie the definiteness effects stated in De Hoop's (1992) generalization, with the relation between the rule of *anaphoric destressing*, and the effect of the 'scrambled' configuration on the *focus set*. The direct object in the scrambled configuration is not in the focus set, and therefore it is necessarily unstressed. If it is anaphoric, then the scrambling base-generated structure eliminates the need to apply an extra rule of *anaphoric destressing*. Assuming that the stress changing rules are costly, N&R predict a bias towards the scrambled derivation in cases where the object is anaphoric. They argue the descriptive generalization is not definiteness, but anaphoricity, which is a common property of definite arguments. N&R predict that in contexts in which a definite argument is not anaphoric, scrambling would not be felicitous. In (18b) ('*#no, he has [the window]$_F$ yesterday painted'*) the definite object is not anaphoric and N&R correctly predict that it should be infelicitous in the 'scrambling' configuration. Another piece of evidence supporting their restriction of scrambling in terms of anaphoricity is that pronouns, which are prototypically used as anaphors, are marginal in non-scrambled positions.

(27) a   #Ik heb gisteren hem gezien
         I have yesterday him seen

     b   Ik heb hem gisteren gezien
        I have him yesterday seen

Since pronouns are inherently anaphoric, it follows that they must be destressed, and therefore they are predicted to favor the scrambled order as a rule. N&R thus provide a PF-account for scrambling and its correlation to anaphoricity, without introducing discourse entities in either PF or in narrow syntax. In the next section I discuss some problematic aspects of N&R's 1998 and Reinhart 2006 PF-theory of Dutch scrambling.

3.3.1.2 Problems with Neeleman and Reinhart 1998 PF-theory of Dutch scrambling

N&R's 1998 theory of Dutch scrambling crucially relies on Reinhart's 2006 claim that the semantic focus is read directly off sentence stress. However, Kadmon 2001, 2009 shows that main stress on the direct object does not suffice for interpreting IP or VP as a semantic focus. Rather, sentential and VP focus require additional elements in the sentence to be assigned a pitch accent (a tonal entity aligned with a syllable bearing main word stress).

(28) Q: lama at kol kax smexa?
        Why are you so happy

    A$_1$: # Max kana kélev (Max bought a-dog)
                    H*

    A$_2$: Max kaná kélev[17]
        H*   L* H*

Reinhart's problem is that she ignores the role of pitch accent in the identification of focus entirely. It is impossible to assign sentence stress to all the words in (28A$_2$) (Goldsmith 1976), and it may very well be that sentence stress is still assigned to the object. However, this does not eliminate the requirement to place a pitch accent on additional words, in order to induce a broader focus.

Moreover Selkirk 2007 cites phonetic experiment by Katz and Selkirk (2005/6) that shows that the unmarked sentence stress (assigned by NSR) allows only a broad sentential focus, and for other choices main stress is prosodically more prominent, suggesting that it is assigned by a different procedure (NSR sentence stress is marked by capital letters, and the narrow focus sentence stress by boldface).

(29) Wittgenstein only$_i$ [brought a glass of wine over to **Ánscombe**$_i$]
    (I was surprised until I found out that Geach, who was standing with her, was on the wagon)

(30) (out of the blue): Wittgenstein brought a glass of wine over to ÁNSCOMBE

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[17] IP focus does not necessarily imply that all words are accented, but in (28A$_2$) they are.

According to the results from the phonetic experiment of Katz and Selkirk (2005/6), the prosodic prominence of Ánscombe in (29) is significantly greater than in (30) (measured in terms of duration and pitch boost), suggesting that sentence stress is not assigned by the same procedure in both cases.

Another problem is that N&R assume that Selkirk's 1986 *Align XP_R* rule is a universal rule for prosodic phrasing, which was shown to be empirically wrong (see Selkirk 2000 for discussion, discussed here in section 3.1.1 above). Selkirk showed that it was respected in English, and it could very well be that it was also respected in Dutch, however, whether or not it actually holds in Dutch, or any other OV languages in which scrambling is found, is an empirical matter, and cannot be assumed without independent evidence.

Furthermore, one of the strongest pieces of evidence for N&R's theory comes from the alleged generalization (Neeleman and Weerman 1996) that scrambling is not possible in VO languages. In order to maintain this generalization they assume V-movement, to derive the intervention order found in VO languages. This would require accusative Case checking by the trace of the moved verb, but if Truckenbrodt (1999) is correct in arguing that the trace of the verb is not visible to PF, it would fail to check the Case of the argument at PF. Truckenbrodt's 1999 claim is supported by Grodzinsky and Finkel's 1998 findings; they show that while a range of symptoms in aphasia can be accounted for in terms of the inability to identify XP chains (traces), these results do not carry to X^0 chains. These findings are compatible with Truckenbrodt's 1999 claim that there are no visible traces of verb movement. Moreover, as I have shown in chapter 2, Hebrew allows adverbs intervening between the verb and its direct object (the 'target paradigm'), which cannot be explained by verb movement. The configuration with the adverb intervening between the verb and the object is optional, and it is dependent on contextual considerations (see chapter 2 above).

There is also an empirical problem with the English alleged 'scrambling' example with a PP argument illustrated in (28b) repeated below from (10b).

(31) a Max slowly read to his children

b Max [$_{V'}$[$_V$ read [slowly]] to his children] (but not to his nephews)

(31b) is judged by many speakers as marginal to ungrammatical, and it requires a contrastive interpretation, and Focus on the argument. However N&R's theory predicts the 'scrambling' construction to be impossible in contexts where the object is assigned main stress, because the object is not in the focus set of the scrambled structure (31b).

Finally, there is a conceptual problem with N&R's 1998 theory: the choice between the two structures is dependent on contextual information (whether or not an antecedent for the object is accessible in the discourse). This implies that a decision concerning Merge must take the context into account. This is problematic according to Chomsky's *Inclusiveness Condition*, which they assume, since the discourse information is not supposed to be accessible in the course of the syntactic derivation[18].

3.3.1.3 Back to Wijler Sentences

The question now, is whether N&R's theory could be used to account for the alternation between Infl sentences and Wijler sentences, i.e., can we assume that the adverb in the these configurations can be either base-generated adjoined to the verb yielding a structure as in (32a), or to an inflectional projection as in (32b).

(32) a ben [$_{VP}$[$_{V'}$ [$_{V2}$ [$_V$ metaken] [$_{ADVP}$ tamid]] et [$_{DP}$ hamexonit hakxula]]]
        Ben   fixes   always   acc the-blue car

      b ben [$_{I'}$[$_{ADVP}$ tamid][$_{VP}$ [metaken et [hamexonit hakxula]]
        Ben   always   fixes acc the-blue car

Let us assume, as a start that Hebrew checks accusative Case in the syntactic c-command domain, where adjacency is not an issue. The problem is that the configurational distinction between (32a) and (32b) does not provide any justification for the obligatory association, or for the exhaustivity of always in Wijler sentences. The adverb in (32a) is not syntactically associated with the object, just as much as in (32b), and since association is optional in (32b) there is no way to predict that it would be obligatory in this case. Furthermore, even if we assumed that the adverbs in the Wijler sentences are

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[18] Note that if they would assume that the choice is made as a last resort repair mechanism, it would imply that this is more costly then destressing.

adjoined to the verb, there would be no way to determine the contexts in which they are licensed based on N&R's theory. Sentence stress in (32a) is predicted to fall on the adverb, giving rise to the focus set: {ADV, V_2=V-ADV, VP, IP}, and the focus set of (32b) would consist {DP, VP, IP}. The prediction of N&R's theory is that the Wijler senteneces would be used only if either the adverb were the focus, or the conjunction of the adverb and the verb. However, main stress in the discussed configurations falls on the object in many cases, so there is no motivation for the alternation. In addition, N&R's theory has no means of accounting for contextual restrictions on Wijler sentences (#*he ate davka an apple* vs. *he ate davka a candy*), or for the inference that the speaker expected the described state of affairs to have been different.

3.3.2   Icelandic Object Shift – Optionality and Discourse Dependence

In this section, I turn to the phenomenon of Icelandic Object Shift, which, like the 'traget paradigm', involves optional orderings of adverbs, verbs and arguments that depend on discourse. Icelandic object shift is illustrated in (33a-b):

(33) a Jón las bókina ekki
         Jón read books-the not

      b Jón las ekki bókina
         Jón read not books-the

The assumed basic order for Icelandic is: Subj-Adv-V-Obj (with *ekki* 'not' analyzed as an adverb). According to syntactic analyses of Object Shift (Chomsky 2001, Bobalijk 2002, discussed in chapter 2 above) the verb has been fronted in both (33a) and (33b), which is why the adverb in both follows the verb. Focusing on Chomsky 2001 theory for concreteness, the object was fronted to the edge of the *v*P, yielding the Object Shift (henceforth OS) construction. Like our alternation, Icelandic OS is optional, and the choice between the two configurations is determined based on contextual information. According to Holmberg 1986, 1999 and subsequent studies, OS sentences like (33a) (*Jon read the-books not*) are felicitous only if the argument is *not a focus*, so in a context with

a question about the identity of the object that Jón read, the OS structure (33a) would be infelicitous.

3.3.2.1   Icelandic Object shift in PF – within the F-structure model (Erteschik-Shir 1997, 2005, 2006)

In her thorough research into the properties of Scandinavian Object Shift, Erteschik-Shir 2005 presents a PF-based theory deriving Icelandic OS, couched in her model of *Focus Structure* (Erteschik-Shir, 1997, 2006). According to this model, optionality is characteristic of phonology; hence E-S argues that Icelandic OS results from phonological processes. Modifying Åfarli 1997, E-S assumes that adverbs can be linearized anywhere within or at the edges of the projection that they modify, and their exact position is determined by prosodic considerations. E-S argues that Icelandic adverbs are prosodically weak, and as such they must be prosodically incorporated with a prosodically stronger word to allow their pronunciation. She refers to this operation as *Prosodic Incorporation PI*. E-S claims that the choice of the host for PI is determined by language specific prosodic properties, and that in Icelandic the object DP is the host for PI of the adverbs.

According to E-S, another language specific prosodic fact is that Icelandic allows PI either following or preceding the DP; she assumes that Icelandic is an SVO language and argues that the two orders result from the flexibility of PI. When the adverb incorporates following the DP, the result is: S-V-O+ADV (*Jon read the book not* (30b)), and when it incorporates preceding the object, the result is: S-V- ADV+O (*Jon read not the book* (30a)). Thus, E-S correctly predicts the optionality of order, and she need not assume syntactic movement of the verb or of the object. E-S' next step is to explain the dependence on discourse considerations.

Following Diesing and Jelinek, 1993, E-S argues that the generalization concerning the "shifted" objects is that they must be *topics* (contra Holmberg 1999 who identifies them only as non foci). In the model of F(ocus) structure (Eerteschik-Sir 1997, 2006) words are annotated as topic or focus in the course of the syntactic derivation, and

phonological processes can make use of this information. E-S argues that languages often signal topics by phonological fronting, and that the main topic of the sentence is fronted to the left edge of the sentence, and the position immediately following the verb is used for a secondary topic. E-S' F-structure model contains a processing *Identification* (*ID*) rule, disambiguating grammatical and discourse functions encoded in the structure (Subject, object, Topic and Focus). This rule operates in the phonology, and when there is an alternation, it ensures that the choice is the most suitable one for disambiguation. Given the optional order of Icelandic PI, the Identification ID rule motivates the choice of the 'shifted' order (S-V-O-ADV), when the object is a topic. The adverb is PIed immediately following the object, which ends up in the position where it is unambiguously identified as topic.

E-S thus provides a simple account for Icelandic OS, with its dependence on contextual information. She provides independent evidence that the adverb and the object form a prosodic phrase in Icelandic, and this eliminates the need to assume that any movement is involved. In the following section I will discuss some problems encountered by E-S' theory of Icelandic OS.

3.3.2.2   Problems with Erteschik-Shir's theory of Icelandic OS (Erteschik-Shir 2005)

E-S assumes that the decision of the host for PI is based on language specific prosodic properties. The only restriction on the host in Selkirk 1995 is that it should be a stressed word. There are PI cases in which the choice of the host is determined by the syntax. For example, weak pronouns are PIed with the verb of which they are arguments, based on the syntax, with no cross-linguistic variation. The adverb case is more complicated because it is predicted to be syntactically flexible, in the domain of the modified projection (E-S's 2005 modification of Åfarli 1997). Still, there is nothing in the prosody to make one prosodic word a better host than another, and there is essentially no prosodic motivation for these language particular choices. The data tell us what the prosodic phrases that get generated are, but they do not tell us what kind of prosodic properties are relevant to prosodic phrasing. Another problem is that E-S' motivation for the choice of

the PI-order of the adverb involves the properties of the object. As far as I can see, the F-Structure model does not provide the possibility for the adverb to access the *topic* annotation on the object. The F-structure model annotates words for being topic or focus, but there is no syntactic common domain where the adverb can access the information on the object. Finally, E-S argues that Icelandic is an SVO language, and in addition she claims that the position immediately following the verb is a topic position, however in SVO languages the object immediately following the verb tends to be a focus. The topic-fronting story is compatible with a theory assuming that the object has been fronted, but it is less suitable under E-S' analysis.

3.3.2.3 Back to Wijler Sentences

Prima facie, the ingredients in E-S' theory of Icelandic OS seem to be comatible with the alternation between Infl sentences and Wijler sentences. Prosodically, the adverbs in Wijler sentences are morphologically simplex, and some of them consist of only one syllable (*rak* 'only', *gam* 'also'). Moreover, the configuration requires linear adjacency between the adverb and argument, suggesting that they may be contained in one prosodic phrase.

(34) #Salom axSav meyaceget bekoSi, lefi ma Se Samati, et acma
Peace Now represents barely, according to what I heard, acc itself

(35) #hacorfatim maadifim davka , lefi ma Se Samati, et merkel
the-French prefer contra-belief, according to what I heard, acc Merkel

One could hypothesize that the adverbs in Wijler sentences are prosodically weak and that they could PI to the left of either the verb or the DP. However, there is evidence that the adverbs in the Wijler sentences are not prosodically deficient in any way. First, many adverbs in Wijler sentences retain their word stress, in context as well as in isolation. A specifically striking case is that of *lo* 'not'; it can form a prosodic word with a following lexical verb (not in a Wijler sentence), but the lexical verb loses its stress, and the adverb's stress stays intact. By contrast, when a *prosodically weak* pronoun is combined with a verb creating one prosodic word, it loses its word-stress or its stress is retraced, in order to avoid two adjacent stressed syllables (Obligatory Contour Principle OCP

(Goldsmith 1976)). Kadmon 1986 analyzes a process of vowel deletion in Hebrew, inducing a prosodic word, and she shows that the resulting prosodic word respects the OCP.

(36) a a.tá me.vín → /á.tam.vín/ or / tam.vín/

b a.tá me.vín → */a.tám.vín/

In (36a) the stress of the weak pronoun *atá* 'you' was retraced one syllable, in order to avoid an OCP violation due to a stress clash between the adjacent syllables /tá+m/ and /vín/. Another common resolution for the OCP violation in this case is to delete the first syllable of *a.ta*, and leave the remaining syllable devoid of word-stress producing /tam.vín/ 'you understand'. If *lo* 'not' is prosodically weak then we predict it to lose its stress once forming a prosodic word with the reduced form of *roce* 'want' - /rcé/, just as the weak pronoun atá lost its stress in creating a prosodic word with the reduced form of *mevin* 'understand' - /mvín/. However, the result is the other way around: /ló/ 'not' retains its word-stress and /rcé/ (reduced form of)'want' loses its stress, as in (37) below.

(37) a ló rocé   → /ló/+/rcé/ →*/lór.cé/ – OCP,
        not want

b */lor.cé/ –negation loses its stress

c /lór.ce/ - the verb loses word-stress

This is evidence that /*ló*/ cannot lose its stress. Furthermore there are many occasions in which the adverbs in Wijler sentences have a pitch accent, which cannot be assigned to an unstressed syllable (I mark pitch accent by an asterisk next to a capital letter marking the relative tone).

(38)   hacarfatim hicbi'u dávka lemérkel
                        H*   H*
     The-French voted DAVKA to Markel

(39)   ha'iSa xacta ló bemaavar haxacayá
                        H*   H*
     The woman crossed not at the pedestrian crossing

(40) Mirit yexola leha'ashím rák et acmá
                       H* H*   L*
    Mirit can blame only acc herself

(41) Danya Síbus tevacá   gám et avodót ha-gmár
                     H*   H*   H*
    Danya Sibus will-conduct also acc works the final

If these adverbs can be pitch accented, then there is nothing deficient about them and they would not require Prosodic Incorporation.

One could hypothesize that these adverbs are prosodically weak in some other sense, based on the fact that some of them cannot appear in isolation.

(42) *Max axal tapuax ve avatiax ve Ziva rak
    Max ate an apple and a watermelon and Ziva only

However, given the prosodic facts about *rak* 'only' (that it must retain word-stress) it is more reasonable to assume that the ungrammaticality of (42) results from the fact that the elided material is not recoverable (*what did Ziva eat? only an apple, or only a watermelon?*). This conclusion is supported by the fact that there are adverbs in the Wijler sentences that can show up in ellipsis, when the intended interpretation of the modified constituent can be recovered.

(43) Max tiken et hamexonit ve Ziva gam
    Max fixed acc the-car and Ziva also

To conclude, the adverbs under consideration need not PI for prosodic (pronunciation) motivations, and the optional order must be explained otherwise.

Even if we managed to find a PF explanation of the optional ordering, the superficial prosodic dislocation could not account for the restrictions on the semantic interpretation (e.g., the existential entailment of negation and almost), and in addition it would fail to account for the contextual restrictions (e.g., *he ate davka an apple* vs *he ate an davka a candy*). Finally, there is nothing in Erteschik-Shir's theory that would account for the inferences concerning the speaker's expectations.

3.4   Conclusion

In this chapter, I presented theories accounting for context dependent alternations in word order. I argued that the Wijler sentences do not result of a superficial prosodic dislocation, for three main reasons.

i.   There are no prosodic motivation for the alternation

ii.   A superficial dislocation would not be able to account for the restrictions on semantic interpretation

iii.   Nothing in the proposed theories could with the specific discourse properties of the Wijler sentences

Chapter 4.   Wijler Sentences and 'Association'

The reader has probably wondered about the relation between what is commonly referred to as *association with focus* (or association with contrast) and Wijler sentences. We observe some overlap between the two phenomena:

(1)   a   ha'iSa lo xacta et hakviS <u>bemaavar haxacaya</u>
            the-woman not crossed acc the street at the pedestrian crossing

        b   ha'iSa xacta et hakviS lo bemaavar haxacaya
            the-woman crossed not acc the street at the pedestrian crossing

        c   <u>ha'iSa</u> lo <u>xacta et hakviS bemaavar haxacaya</u>
             the-woman not crossed acc the street at the pedestrian crossing

(1a), with the negation associated with *the pedestrian crossing*, and the corresponding Wijler sentence (1b) are both understood to imply that there is a location at which the woman did cross. This implication does not arise in (1c), where the negation is associated with the whole IP.

    The purpose of this chapter is to address the observed overlap. I will first repeat my assumptions about 'association', from chapter 1. Since most theories of association are interweaved in theories of focus and contrast, I will review a number of theories concerning focus, contrast and association (Rooth 1992, Roberts 1996, Erteschik-Shir 1997, 2006, Vallduví and Vilkuna 1998 and Beaver and Clark 2008). I will first show that we cannot assume that the DP PP immediately following the adverb in Wijler sentences is necessarily the 'focus' of the sentence. I will then show that it is not good enough to assume that whatever mechanism of association applying to adverbs in Infl (e.g., (1a)) also applies in Wijler sentences; that could account for some similarities between the two types of sentences, but it could not account for the distinctions between them. I will therefore propose a view of association on which 'association' between adverb and argument in Wijler sentences is a semantic fact originating in their syntax, whereas association with parts of a syntactic argument (as in 1a) arises pragmatically.

4.1.   Association in an Intuitive Sense (from chapter 1)

We intuitively identify the 'associates' in the following sentences as follows:

(a) Only <u>Bill</u> smiled x smiled	*only* associates with *Bill* **Bill** is the only value for x that verifies this.
(b) She speaks only <u>Chinese</u> she speaks x	*only* associates with *Chinese* **Chinese** is the only value for x that verifies this.
(c) I only have eyes for <u>you</u> I have eyes for x	*only* associates with *you* **You** is the only value for x that verifies this.
(d) Bill didn't buy a <u>red</u> jacket Bill bought a P jacket	negation associates with *red* **Red** is a value for P which does not verify this.
(e) I even introduced <u>Bill</u> to Sue I introduced x to Sue	*even* associates with *Bill* **Bill** is the value for x least expected to verify this.
(f) The sun always sets in the <u>west</u> The sun sets in x	*always* associates with *west* For every event e of the sun setting, **the west** is a value for x which verifies the sun set in x at an event.

We may say that in all cases of 'association', the 'prejacent' (the sentence minus the adverb) is factored out into a 'skeleton', which is an open formula, or the corresponding lambda abstract, and an 'associate', which is a value for the free variable in the open formula (as illustrated with the above sentences). Consider for example:

(2)   Bill didn't buy a <u>red</u> jacket

   Prejacent: Bill bought a red jacket

   Skeleton: Bill bought a P jacket   OR: λP[Bill bought a P jacket]

   Associate: red

Intuitively, 'association' means that the adverb comments on the connection between the associate and the skeleton. In (2), the adverb says that the associate does not verify the open formula.

   In all the Wijler sentences studied so far in this dissertation, the adverb associates in the above sense with the immediately following DP or PP. Indeed, that seems to be obligatory. For example, in (1b) above negation obligatorily associates with *the pedestrian crossing*, and in (3) below *davka* obligatorily associates with *Merkel*.

(3)   hacorfatim maadifim davka et merkel lenesi'ut ha'ixud
the-French prefer contra belief Merkel for presidency of the (European) union

Skeleton: the French prefer x for presidency

OR: λx[the French prefer x for presidency]

Associate: Merkel

In (3), the adverb says that assigning the value Merkel to the variable x creates a proposition which is contra belief.

4.2.   Focus, Contrast and Association- Rooth 1992, Roberts 1996, Erteschik-Shir 1997, 2006, Vallduví and Vilkuna 1998, Beaver and Clark 2008

4.2.1   Association and The Focus Interpretation Principle - Rooth 1992

According to Rooth' (1985) theory of focus, focus is a grammatical property, encoded as an abstract feature in the syntax. This feature is read by PF, giving rise to prosodic prominence, and by LF, in which it gives rise to a focus semantic value. Thus, each sentence has a pair of semantic values: an *ordinary semantic value* and a *focus semantic value*. The focus semantic value is a set of alternatives obtained by replacing the focus with a variable, and assigning the variable different values of the same semantic type (I represent the focus semantic value with a superscript f, and the ordinary semantic value by a superscript o).

(4)   John introduced [Steve]$_F$ to Bill

The focus semantic value of (4):

⟦(4)⟧^{f} = {the proposition that John introduced d to Bill: d∈D}

In a model containing only the individuals: John, Mary, Steve and Bill, the focus semantic value of (4) (i.e., ⟦(4)⟧^{f}) is the following set: {⟦John introduced John to Bill⟧^{o}, ⟦John introduced Bill to Bill⟧^{o}, ⟦John introduced Mary to Bill⟧^{o}, ⟦Jhon introduced Steve to Bill⟧^{o}}

Further, Rooth 1992 restricts the use of focus with 'The Focus Interpretation Principle (FIP)'.

(5) *The Focus Interpretation Principle (FIP), Rooth 1992*
(as stated in Kadmon 2001):
A constituent may be focused iff
it is contained in a clause S of which the following holds:
somewhere in the environment there is an (independently) salient set of propositions call it Γ such that:
(i) $Γ ⊆ ⟦S⟧^f$, and
(ii) $⟦S⟧^o ∈ Γ$, and
(iii) there is some proposition p such that $p ≠ ⟦S⟧^o$ and $p ∈$ Γ

Let us see how Rooth's 1992 accounts for the association of *only* with focus. Consider the following sentence:

(6) John only introduced [Steve]$_F$ to Bill

Assume that the semantics of *only* is as follows:

(7) If *only* $[φ]$ is of type t, then for all $w ∈ W$,
$w ∈ ⟦only[φ]⟧^{M,g}$ iff for all $p ∈ C$, if $w ∈ p$, then $p = ⟦φ⟧^{M,g}$
where C is a contextually supplied set of propositions

According to Rooth, the reading on which *only* associates with the focus *Steve* arises when the domain of quantification of the universal quantifier introduced by *only* (i.e., C in the above clause) is set to **a (contextually relevant) subset of the focus semantic value** of the prejacent (=the sentence minus *only*), i.e., of $⟦(4)⟧^f$, given above. In that case, C is a contextually relevant set of propositions of the form 'John introduced d to Bill', and (6) claims that of all the propositions in that set, the only one which is true is the proposition that John introduced Bill to Steve.

Clearly, association with focus is one way in which the FIP might get satisfied: when C is set to a subest of the focus semantic value of the prejacent, it plays the role of

that independently salient set Γ which is required by the FIP. Thus, the FIP provides motivation for association with focus. Crucially, however, if the FIP is satisfied in some other way, then the domain of quantification for *only* can be independent of the focal structure of the sentence. For example:

(7) people who [grow]$_F$ rice generally only [eat]$_F$ <u>rice</u> (Rooth 1992, p. 109)

Normally, we would understand (7) to mean that the only thing that people who grow rice eat is rice, i.e., the associate is *rice*, and not (the focus) *eat*. How is the FIP satisfied in this case? We could take the focus semantic value of part of the clause *t [grow]$_F$ rice* (with t being a trace coindexed with the head noun *people*). There is a contextually salient subset of that focus semantic value which can play the role of the set Γ required by the FIP, namely the set {'t grow rice', 't eat rice'}, hence the FIP is satisfied. But that means that we can satisfy the FIP independently of how we fix the domain of quantification for *only*, so Rooth 1992 correctly predicts that *only* need not associate with the focus in this case.

4.2.2 Focus as an Answer to the Question Under Discussion (Roberts 1996)

Roberts proposes a theory of the organization of information in the discourse, relative to questions being addressed. Her constraint on the use of focus is couched within this general framework. In the following section I present Roberts' framework, as adapted in Kadmon 2001. Roberts adopts Hamblin's (1973) semantics of questions, determining that the denotation of a question is a set of alternatives obtained by replacing the wh-word with a variable and assigning it different values of the same semantic type. As in Kadmon 2001, I use ?[Q] as a logical translation of a question. Consider for example:

(8) Who did Dan kiss? translates as ?[kiss(Dan, who)]

The semantic value of (8) would be as follows:

⟦?[kiss(Dan, who)]⟧^{o} = the set of propositions of the form 'Dan kissed d', for some d∈D

If the model contains just three individuals, Dan, Mary and Jane, then the denotation of (8) is the set in (8').

(8') {⟦Dan kissed Mary⟧°. ⟦Dan kissed Jane⟧°, ⟦Dan kissed Dan⟧°}.

Roberts makes the following assumptions about what constitutes an answer to a given question:

(9) A proposition p is a **partial answer** to a question Q iff

p contextually entails the truth value of at least one member of the denotation of Q.

A proposition p is a **complete answer** to a question Q iff

p contextually entails the truth value of each member of the denotation of Q.

She assumes that besides propositions, the common ground contains a set of those questions that are currently addressed in the discourse. These questions are called **questions under discussion** (QUD for short). A question that has been raised explicitly or implicitly by the interlocutors is added to the set of questions under discussion. A question is removed from the set of QUDs once it has been answered (it is no longer under discussion). All utterances, including propositions and questions, are called 'moves' of the discourse.

According to Roberts, relevance of an utterance is defined in terms of its contribution to the task of answering the current question under discussion.

A definition of a directly relevant 'move' in the discourse:

(10) A move α is directly relevant to a question Q iff

(i) if α is a proposition then α is a partial answer to Q

(ii) if α is a question then α is a subquestion of Q[19]

Consider for example:

(11) A: Who arrived?

---

[19] The definition of 'subquestion' will be provided in the following paragraph.

B: Mary arrived

B's response is considered relevant because it is an answer to A's question; it may be a complete answer (if we know in the common ground that only one person arrived), in which case the question is removed, or it may be a partial answer. Consider another example (taken from Kadmon 2001):

(12) A: Who invited who?
　　 B: (well,) who did Mary invite?
　　 C: Let's see, did she invite Nathan?

Both B and C are intuitively perceived as serving the goal of answering A's question. In order to account for this intuitive notion of relevance Roberts defines subquestions:

(13) A question Q_2 is a subquestion of a question Q_1 iff

the complete answer to Q_2 is a partial answer to Q_1

B's question is a subquestion of A's question, in the sense of (13), because a complete answer to it would be a partial answer to A. That is, an answer to 'who did Mary invite?' entails the truth value of some alternatives in the denotation of A's question (the alternatives in which Mary invited someone). Similarly, C is a subquestion of both B and A. If the answer is that she did invite Nathan, then it entails a partial answer of B, and a partial answer of A. If the answer is negative, it is either a complete answer to B, if Nathan is the only potential invitee, or it provides a negative truth value for one of the alternatives in B's and in A's questions.

Roberts further proposes that as a general rule, the interlocutors aim to answer the **most recently** accepted question. She regards the set of QUDs as a "push down" store, so that once the most recent question is fully answered, it is removed from the stack, and the interlocutors aim to answer the most recently asked question just before that one. The most recent question addressed by the interlocutors is called the last question under discussion, represented as: *last(QUD(α))* for any move α (the QUD to which α is required to be directly relevant).

(14) Each move α in the discourse is required to be directly
relevant to the *last(QUD(α))*.

We are now in the position to present Roberts' theory of focus. Roberts assumes that every move in the discourse (statement or question) has a focus semantic value, defined as in (15), and proposes the constraint in (16).

(15) $⟦φ⟧^{M,g}$, the focus semantic value of a formula φ relative to an arbitrary model M and an assignment function g is a set of ordinary semantic values obtained by replacing the focus subformulas and the WH words in φ with variables, and then interpret the result relative to an assignment function g', which is identical to g except perhaps for the value of those variables.

(16) The **Question-Under-Discussion** Constraint on focus:
An utterance B whose logical translation is β or ?[β], where β is a formula, is felicitous only if $⟦β⟧^f = last(QUD (⟦B⟧^o))$

With this in place, we can see Roberts' account of the association of *only* with focus.
Consider for example:

(17) A: Who did Mary invite to dinner
B: Mary only invited [Sue]$_F$ to dinner

The QUD constraint on focus is stated for 'utterances', so it must involve the focus semantic value of the entire (17B), and could not be satisfied via the focus semantic value of the prejacent, or of any other part of the utterance. The focus semantic value of (17B) is as in (18):

(18) $⟦17B⟧^f =$ the set of propositions of the form:
'Out of the set C of relevant propositions, only the proposition that Mary invited d to dinner is true', for some individual $d \in D$

Therefore, in order for the QUD constraint to be satisfied, the last QUD when (17B) is uttered must be the following question.

(19) What individual d∈D is s.t. out of the set C of relevant propositions, only the proposition that Mary invited d to dinner is true?

That is not the question provided explicitly in the context, but Roberts assumes that it is implicitly present in between (17A) and (17B). However, in order for (19) to really be implicitly present there, it must be directly relevant to (17A) – in other words, a subquestion of (17A). Roberts argues that that is why *only* in (17B) has to associate with the focus: it is this association that guarantees that (19) is relevant to (17A). If *only* associates with the focus (as we know it does), then the domain of quantification C for *only* is (a contextually relevant subset of) the set of propositions of the form 'Mary invited d to dinner', for some d∈D. But that means that question (19) boils down to (20).

(20) What individual d (whose being invited by Mary is contextually relevant) is the only individual that got invited to dinner by Mary?

And (20) is indeed directly relevant to (17A) – the complete answer to (20) expressed by (17B) provides a partial answer to (17A).

4.2.4   Erteschik-Shir 1997, 2006 – Contrastive Focus

Erteschik-Shir 1997, 2006 assumes focus semantic values as in Rooth 1985, however she proposes a distinction among different types of foci. One kind of focus is the **contrastive** focus, which requires a *Contrast Set*; a '*Contrast Set*' is a subset of the focus semantic value, of which the propositions were explicitly mentioned in prior discourse. (Note that this is far more restrictive than the restriction imposed by Rooth's FIP).

(21) Q: Which laundry did John wash, the white or the colored?
A: he washed the [white]$_F$ laundry

In (21), the question explicitly stated mentions two alternatives: (a) John washed the white laundry and (b) John washed the colored laundry, and the contrastive focus in A's response represents the choice between them; According to Erteschik-Shir contrastive focus is necessarily exhaustive, because the members of the contrast set are explicitly stated and the contrast represents a choice among them (this is compatible with the Hungarian exclusive "focus movement" discussed in chapter 2 of this dissertation).

Erteschik-Shir defines a second kind of focus, the **restrictive** focus requiring a subset of the focus semantic value of which the alternatives are Discourse linked in the sense of Pezetsky 1981 (the D-linked elements were either overtly mentioned in prior discourse, or their common noun was mentioned).

(22) Q: Which of John's friends did he introduce to Sue
       A: He introduced [Steve]$_{(restrictive)F}$ to Sue

The common noun '*John's friends*' makes the set of John's friends Discourse linked in Pesetzky's sense, without this set being explicitly provided in the context, and therefore, the restrictive focus, need not be exhaustive. Association of *only* with focus would presumably arise in the use of focus (contrastive or restrictive), where its domain of quantification would be set to the contrast set, being an explicitly provided, or a D-linked subset of the focus semantic value of the prejacent.

4.2.5   Another View of The Contrast and Focus – Vallduví and Vilkuna 1998

Vallduví and Vilkuna 1998 argue that there are two distinct discourse entities *rheme*, which stands for the *new* or *non-presupposed information* (corresponding to the answer to the question under discussion), and *kontrast,* which stands for various phenomena involving quantification over alternatives, in the sense of Rooth 1985. Vallduví and Vilkuna define Kontrast as generating a subset of Rooth' (1985) focus semantic value, in which the alternatives are "comparable" to the ordinary semantic value of the sentence; "comparable" indicates *contextual and ontological restrictions*. These restrictions are not explicitly defined by Vallduví and Vilkuna, but perhaps they could mean that the alternatives are salient in discourse (D-linked or otherwise). Vallduví and Vilkuna argue that *only* is among the kontrastive elements, indicating that it requires a subset of the focus semantic value (consisting of alternatives "comparable" to the ordinary semantic value of the sentence). This implies that according to them the association of *only* with kontrast is obligatory. They do not say anything of how this kontrast is identified. For example (nuclear accent in boldfaced):

(23) A: why are you so excited?

B: There is only a month till **Christmas** now

The rheme of (23B) is the whole proposition, including the prosodically prominent *Christmas*, however the kontrast set for *only* places a variable in the place of the unaccented *a month*, so that the kontrast set is subset of a set of propositions like:

$\{\llbracket$there is a month till Christmas now$\rrbracket^o$, $\llbracket$there is a year till Christmas now$\rrbracket^o$, $\llbracket$there is a week till Christmas now$\rrbracket^o$, etc$\}$

Crucially, the only way to know that **this** set (with the variable for *a month*) must be generated is that we understand *a month* to be the associate of *only*, since it is not marked in any other way.

4.3   A Closer Look at Association - Beaver and Clark (2008): the Patterns of Focus Association of 'Only', 'Not' and 'Always'

4.3.1 Beaver and Clark's (2008) General Theory of Focus and Focus Association

Beaver and Clark argue that the association with focus is not a uniform phenomenon and that different adverbs display different patterns of association, motivated by distinct factors in the grammar. They classify the association processes into three types, which they call Quasi, Free and Conventional (the QFC model). For example, they argue that the association of *only* with focus is conventional, i.e., it is encoded in the semantics of *only* that it associates with the focus. Negation, on the other hand, displays Quasi association, which is derived as a pragmatic inference; it is not encoded in the semantics of negation, but there is a specific intonation contour resulting in an inference associating the negation with a focus argument. Finally, *always* displays what Beaver and Clark refer to as 'Free' association, arising in the resolution of a free parameter. For example, the restriction on the universal quantifier contributed by *always* may, but need not, be set to the propositions in the focus semantic value (Rooth 1985), in which case we would say that *always* associates with the focus.

Beaver and Clark assume Hamblin's (1973) semantics of questions, and follow Roberts 1996 in assuming that the focus is an answer to the Current Question (=the last

Question Under Discussion). Beaver and Clark postulate the Current Question Rule given in (25).

(25) Beaver and Clark's *Current Question Rule* (their (2.53): p. 36)

The Current Question must contain at least one true alternative, and contain multiple alternatives, which are not resolved as true or false in the common ground.

The Current Question (CQ) rule (25) determines that the denotation of the CQ must contain at least one true answer, as well as some unresolved alternatives. Following Roberts' 1996 Beaver and Clark argue that focus is the answer to the CQ, and in addition they assume that it is necessarily the prosodically most prominent expression in the utterance. Finally they assume that an utterance induces a focus semantic value (as in Rooth 1985).

(26) Beaver and Clark's (2008) **Focus Principle** (their (3.2): p. 45):

Some part of a declarative utterance should evoke a set of alternatives containing all the Rooth-Hamblin alternatives of the Current Question.

Like Rooth, Beaver and Clark let the focus semantic value contain either alternatives based on the utterance or ones based on parts of the utterance. Accordingly, they assume that a focus semantic value can be assigned to the prejacent (the sentence minus the adverb) as well as to the whole utterance, e.g., *Dan didn't danced with **Lucy**'* could be an answer to the question '*with whom did Dan dance*' as well as '*with whom didn't Dan dance*'.

4.3.1.1 Negation – Quasi Association

Negation, in Beaver and Clark's model, displays quasi association. This means that there is no necessary relation between what the negation is taken to deny and the Current Question, though such a relation sometimes arises as a pragmatic inference.

Beaver and Clark present three intonation contours for an utterance with an accented argument and negation (I mark their assumption of focus with square brackets and a subscript F).

(27)   Kim doesn't study [Linguistics]$_F$ at Northwestern

   (a)   H*   LL%

(b)	L+H*	LH%
(c)	L*	LH%

(27) could answer questions based on the utterance, or on the prejacent, as in (28):

    (28) a   What doesn't Kim study at Northwestern (based on the utterance)

          b   What does Kim study at Northwestern (based on the prejacent)

They refer to the (27a) contour as a 'neutral declarative' contour; they say that it does not convey a need for information or uncertainty, and therefore it is understood as a complete answer. Since it would not be a complete answer of the affirmative question (28b), the hearer infers that it answers the negative question (28a). According to Beaver and Clark 2008 there is no effect of association in this contour. The contour in (27b) implies uncertainty, incompleteness and even incredulity. As an answer to a question, this contour signals that more information is required. According to Beaver and Clark, this contour can be perceived as a partial answer to either of these questions, and the negation does not associate with the focus. The utterance in the contour in (27c) induces an inference that there is something that Kim does study at Northwestern. Beaver and Clark explain this, relying on the interpretation of this intonation contour. The intonation contour in (27c) (Liberman and Sag's 1974 'contradictory contour'), is used to deny or contradict an existing assumption in the discourse.

    Beaver and Clark use their focus principle, in (26), in conjunction with their CQ rule (25) to explain how the inference comes about. Now, to what question would (27c) be an answer, so as to be licensed by (26)? The contradictory contour implies that it is used as a denial of a corresponding positive statement '*Kim studies Linguistics at Northwestern*', and from this we may infer that it is used as an answer to the positive question (28b). Therefore, based on the CQ rule in (25) above, the hearer infers that there is a true answer to the positive question (i.e., there is a true proposition of the form *Kim studies x at Northwestern*).

4.3.1.2 Free Association – The Case of *Always*

Beaver and Clark argue that the association of *always* with focus arises as a result of a process resolving the value of a free variable in the discourse. Following Lewis 1975, Kamp 1981, Heim 1982, and De Swart 1993, they assume that the semantics of

quantificational adverbs like *always* contains a restrictor and a (nuclear) scope. This is illustrated for (29) below.

(29) Whenever Kim serves Sandy something, he always serves her Johnny Walker

Quantifier: ($\forall$)

Restriction: Kim serves Sandy x at e

Nuclear Scope: Kim serves Sandy Johnny Walker et e

I.e., Every event of Kim serving something to Sandy is an event of him serving her Johnny Walker

In (29) both the restriction and the nuclear scope are provided explicitly in the utterance, but the domain of quantification can in principle be fixed based on various contextual considerations. I illustrate Beaver and Clark's theory of Free association with (30) below.

(30) Kim always serves Sandy [Johnny Walker]$_F$

The resolution of the parameter for the domain of quantification of the quantifier introduced by *always* can make use of the salient set of propositions of the form *Kim served Sandy x,* for different choices of *x*, corresponding to the focus semantic value of the prejacent. And then we get exactly the same interpretation we got for (29).

Thus, Beaver and Clark correctly predict the association of *always* with the focus in (30), and in addition they correctly predict the optionality of association with focus. If the context presents a better candidate for the domain of quantification, then association is predicted not to arise. This is illustrated in (32) below (from Beaver and Clark 2003).

(32) Mary always managed to complete [her exams]$_F$

The focus semantic value of the prejacent introduces propositions of the form:

Mary managed to complete x.

Preferred reading: Whenever Mary took exams she managed to complete them.

i.e., every event of Mary taking exams has a subevent of an event of her managing to complete them

Marginal reading: Whenever Mary managed to complete something she managed to complete her exams

i.e., every event of Mary managing to complete something is one of her managing to complete her exams

The marginal reading of (32) results from setting the free parameter (the domain of quantification of *always*) according to the focal structure, as cases of Mary managing to complete something. But since quantifying over cases of *Mary taking exams* yields a more reasonable reading, that reading is preferred.

4.3.1.3   Conventional Association – The Case of *Only*

Beaver and Clark argue that the association of *only* with focus arises because of a "grammatical dependency on the Current Question" (Beaver and Clark 2008: p. 68). According to them, the discourse function of *only* is to comment on an overly strong expectation regarding the Current Question (CQ). Beaver and Clark (2008) summarize the discourse function of *only* (and other exclusives) as follows:

(33) **Meaning of exclusives** (Beaver and Clark 2008, (10.1): p. 261):

(i) *Discourse function*: to make a comment on the

Current Question (CQ);

a comment which weakens a salient natural

expectation. To achieve this function the prejacent

(the utterance minus *only*) must be weaker than the

expected answer to the Current Question on a

salient scale

(ii) *Presupposition*: The strongest true alternatives in the

Current Question are at least as strong as the

prejacent

(iii)   *Descriptive content*: The strongest true

alternatives in the Current Question are at most

as strong as the prejacent

To illustrate the effect of the discourse function of *only*, Beaver and Clark present the following data.

(34) a   I really expected a suite but I only got a single room with two beds
(web example)

b #I really expected a single room with two beds but I only got a suite
(invented example)

In (34a), the speaker expected a suite, which is perceived as more than 'a room with two beds', and she comments with *only,* conveying that the overly strong expectation was rejected. Beaver and Clark argue that in the absence of an overt CQ, the hearer accommodates one. For example, an utterance like the one in (28a) is licensed as a comment on an overly strong expectation regarding the CQ: 'what did you get'.

4.4.   Wijler Sentences and Association

In the two preceding sections, I went over theories of Focus, Contrast and Association. There are two issues regarding these theories, which are relevant to a theory of Wijler sentences:

> (i)   Is the DP or PP immediately following the adverb in
>   Wijler sentences the focus?
>
> (ii)   What mechanism induces the association effects in
>   Wijler sentences?

4.4.1   Association with Focus and Wijler Sentences

In all the examples we saw so far, the adverb in Wijler sentences is intuitively perceived as associated with the immediately adjacent DP or PP. Consider for example:

(35) ha'iSa xacta et hakviS lo bemaavar haxacaya
        the-woman crossed acc the-street not at the pedestrian crossing

We intuitively understand (35) to mean that what made the proposition false is that it was at the pedestrian crossing. This is the reading for which we would intuitively say that *lo* 'not' associates with the PP: *at the pedestrian crossing.*

A possible hypothesis to account for this generalization would be that the DP or PP immediately following the adverb is necessarily a focus and that the adverb obligatorily associates with that focus in these configurations. This hypothesis could also account for the exhaustive interpretation of *always* in Wijler sentences. Consider the examples in (36).

(36) a   ben tamid metaken et hamexonit hakxula
            Ben always fixes acc the blue car

b   ben metaken tamid et hamexonit hakxula
     Ben fixes always acc the blue car

(36a) has many possible interpretations, for example, the following,

     i.   Every working day in the garage is one in which Ben fixes

       the blue car

     ii.   Every time I see him, Ben fixes the blue

     iii.   Every event of Ben fixing something is an event of him

       fixing the blue

         car

whereas (36b) only has the exhaustive interpretation in iii. Suppose we adopt the above

hypothesis. In that case, the focus of (36b) would be *the blue car*, and the focus semantic

value of the prejacent would contain propositions of the form 'Ben fixes d', for some $d \in D$

(the corresponding CQ would be: what does Ben fix?). Further, the adverb in (36b) would

obligatorily associate with the focus. This association would give us the exhaustive

interpretation in iii: the domain of quantification would consist of propositions of the

form *Ben fixes d*, corresponding to the focus semantic value, implying that there are no

events of Ben fixing any object other than the blue car. And since the association is

obligatory, we would correctly predict (36b) not to allow any other interpretation.

     One could also try to use Rooth's FIP to account for the inference that the speaker

expected the described state of affairs to have been different. Assuming that the DP/PP

immediately adjacent to the adverb in Wijler sentences is the focus, the FIP determines

that the context must contain at least one member of the focus semantic value other than

the ordinary semantic value of the sentence. Consider for example:

(37)   hacarfatim maadifim davka et merkel lenesi'ut ha'ixud
      the-French prefer DAVKA acc Merkel for presidency of the (European)
      union

Assuming that the DP *merkel* is the focus, the focus semantic value of the prejacent

would consist of propositions of the form 'the French prefer d for presidency of the

union', for some $d \in D$. Now, the ordinary semantic value of the prejacent is a member of

that focus semantic value. The FIP determines that there must be one other alternative.

Assuming that the speaker expected that the French would prefer someone else

immediately satisfies this requirement. A weakness of this account is that there could be

other ways in context to get the second alternative, so the FIP does not actually force the inference that the speaker expected it.

4.4.2 Some Considerations Against the Idea that Wijler sentences Grammatically Encode Association with Focus

The hypothesis that the DP or PP immediately following the adverb is necessarily the focus requires independent evidence. Let us first consider prosody. Both adverbs and arguments in Wijler sentences are usually accented, and the arguments may but need not be assigned the nuclear accent, consider the following:

(39) A: lama at kol kax meduket
       why (are) you so depressed?

     B: niSaru rak yomaim ad sof haxofeS   hagadol
         left   only two-days till end the-vacation the-big
         (there are only two days left till the end of the summer vacation)

All words in B's response, have pitch accents. Both *yomaim* 'two-days' and *haxofeS hagadol* 'the big vacation' are prosodically more prominent everything else, however, the most prominent of the two is *the big vacation*. So there doesn't seem to be prosodic evidence that *two days* is the focus.

Does the relation with the last QUD provide evidence that the DP or PP following the adverb is necessarily a focus? No. On the contrary, examples like (39) provide evidence against this hypothesis. In (39), A's question suggests that the focus in B's utterance is not *two days*, but rather the whole sentecne. Well, one could argue that there is an implicit question present, licensing focus on *two days*. It would be something like: 'how many days are there till the end of the summer vacation?'. However, the question *how many days are there till the end of the summer vacation* is not intuitively salient in the context, or even intuitively raised by speaker B, and moreover, following an explicit mention of this question, B's utterance comes out prosodically incongruent, as illustrated in (40) below (where the most prominent accents are marked in boldface).

(40) A: kama yamim niS'aru ad sof haxofeS hagadol?
       How many days are left till the end of the summer vacation?

     B: #niSary rak **yomaim** ad sof **haxofeS   hagadol**
         left   only two-days till end the-vacation the-big

(There are only two days left till the end of the summer vacation)

Consider another example:

    (41) A: lama at ko'eset
             why you angry

          B: ha'idiot haze hexna et ha'oto davka al maavar haxacaya
             This idiot parked acc the car DAVKA on the pedestrian crossing

In this case too, all content words are accented, and there is no contextual motivation to assume an implicit question 'where did this idiot park the car?'. Intuitively, the speaker just provides the reason (out of the set of possible reasons if anything) for her being angry.

    We have seen some evidence, then, **against** the hypothesis that the DP or PP immediately following the adverb is necessarily the focus. Well, this is not so bad, since Kadmon and Sevi 2010 argue extensively that the English *only* is not always associated with the focus either. Vallduví and Vilkuna 1998 already show that the associate of *only* certainly does not have to be the 'focus' in the sense of being 'the rheme' (or in the sense of being 'the answer to the current question under discussion'), by giving the following example.

    (42) A: why are you so excited?

          B: There is only <u>a month</u> till **Christmas** now

The associate of only in (42) is *a month*, whereas the answer to the question, which they term the rheme (new information in some sense) is the entire sentence. Vallduví and Vilkuna bring this as evidence that the association of *only* with a given argument results from its quantificational (kontrast) nature, rather than from considerations of new vs. given information. However, note that there is no independent evidence that *a month* is Kontrast, or any kind on 'contrastive focus' either. Well, one could argue that (42B) addresses an implicit question, namely *How long it is until Christmas now?*. However, there doesn't seem to be any motivation for this assumption. The question *How long it is until Christmas now* is not intuitively salient in the context, or even intuitively raised by speaker B, and moreover, in a context which explicitly contains this question, the

sentence comes out prosodically incongruent, as illustrated in (42') below (nuclear accent marked in boldface).

(42') A: How long it is until Christmas now?

B: #it is only a month until **Christmas** now

4.4.3 Are Wijler Sentences a Grammatical Encoding of 'Association'?

Even if the DP or PP immediately following the adverb is not the focus, we could still assume that there is a mechanism associating adverbs with certain expressions and that Wijler sentences are a grammatical encoding of the association relation.

This hypothesis would account for the intuition that the adverbs in Wijler sentences 'associate' with the DP or PP immediately following them, and for the exhaustivity effects of *always*, in much the same way as the hypothesis of obligatory association with focus.

Suppose that Wijler sentences were a grammatical encoding of the same association mechanism as the one responsible for the association in the corresponding Infl. sentences with the same associate. This hypothesis could not explain those properties of Wijler sentences which distinguish them from the corresponding Infl sentences with the same associate.

First and foremost, this hypothesis would have nothing to say about **the inferences introducing the speaker's point of view**:

(i)   the speaker's expectation that the described state of affairs
         would have been different

(ii)   the accusation effects

 For example:

(43) a   maks tamid roked <u>im lusi</u>
         Max always dances with Lucy

b   maks roked tamid im lusi
    Max dances always with Lucy

The associate of *always* in both sentences is *Lucy*, and the corresponding interpretation is that on every event of Max's dancing Lucy is his partner. However, (43b) induces an inference that the speaker expected there to be events of Max dancing in which his partner is not Lucy. This inference does not arise from (43a), which is perceived as a report of Max's dancing habits with no reference to the speaker's views. Consider another case, in which there is an inference of accusation:

(44) a   ha'ovdim davka hiSbitu et nemal hate'ufa <u>baxagim</u>
         the-workers contra existing belief paralyzed the airport on the holydays

    b   ha'ovdim hiSbitu et nemal hate'ufa davka baxagim
         the-workers paralyzed the airport contra existing belief on the holydays

 (44b) induces an inference that the speaker considers it wrong of the workers to paralyze the airport at that timing, but the same inference does not arise in (44a), in which the adverb associates with the same argument (implying that there was a belief that they would go on strike some other time).

   Also, the association hypothesis could not account for the existential entailment of Wijler sentences with negation or with *almost*. Consider:

(45) a   ha'iSa lo xacta et hakviS <u>bemaavar haxacaya</u>
         the-woman not crossed acc the street at the pedestrian crossing

    …vebeecem hi bixlal lo xacta
      and in fact she did not cross at all

    b   ha'iSa xacta et hakviS lo <u>bemaavar haxacaya</u>
         the-woman crossed acc the street not at the pedestrian crossing

    #…vebeecem hi bixlal lo xacta
      and in fact she did not cross at all

Both (45a) and (45b) imply in some sense that *there is a location where the woman did cross*. However, in (45a) the denial conjunct (implying that there is no place at which she crossed) is perceived as a legitimate wisecrack directing the hearer to correct her assumptions about the context, whereas in (45b), it is perceived as a contradiction. This shows that in (45b) the existential statement is entailed and not merely inferred.

   Another distinguishing property of Wijler sentences which the hypothesis in question cannot explain is illustrated by (46).

(46)   CONTEXT: Ben was going to a costume party for new year's eve with his girlfriend Lucy. When midnight was approaching Ben started looking for Lucy for kissing her. Ben was really drunk by then and he approached the first girl with a hood that he saw. The girl was Sara. As he was approaching her a merciful friend took him by the hand and directed him to Lucy. Now suppose that the merciful friend is telling another mutual friend about the incident:

A: ben kim'at niSek et <u>sara</u>
    Ben almost kissed acc Sara

B: #ben niSek kim'at et <u>sara</u>
    Ben kissed almost acc Sara

In the above context, a natural interpretation of A is that Ben came close to kissing Sara (in a similar possible world in which the merciful friend did not interfere he did), and in the end he kissed Lucy. However, this interpretation is not available for the Wijler sentence, which is unacceptable.

I conclude that we could analyze Wijler sentences as a grammatical encoding of some mechanism of association, but that could not explain the entire range of phenomena exhibited by Wijler sentences.

Another important fact relevant in this connection is the following: in Wijler sentences, what we intuitively identify as the associate is not always the DP or PP following the adverb; the associate can be just **part** of the DP or PP. It is true that in the examples reviewed so far, we intuitively identified the DP or PP immediately following the adverb as the 'associate', but that is not always the case. Consider:

(47) ben kana rak et hasefer Sel hemingwey
      Ben bought only acc the-book of Hemingway

If there is no additional contextual information, then we understand the sentence to mean that the **only thing** (out of a contextually relevant set) that Ben bought was *the book of Hemingway*. On this interpretation we would say that *only* intuitively associates with the immediately following DP. However, there are two other possible interpretations for (47). One interpretation is that the only book that Ben bought was the book of Hemingway. On this interpretation, we intuitively judge that the adverb associates with *Hemingway*, which is only **part** of the DP immediately following the adverb. Similarly, the adverb

could associate with *book*, yielding the interpretation that of all of the relevant belongings of Hemingway, his book is the only thing that Ben bought.

If Wijler sentences grammatically encode some mechanism effecting 'association', that mechanism presumably involves the DP or PP directly following the adverb. Therefore, such a mechanism would leave the cases where the intuitive associate is part of that DP/PP unexplained.

4.4.4   My Analysis of Association

I propose the following.

[A] The lexical entries for all the adverbs studied in this dissertation contain a constraint stating that the syntactic argument of the adverb is necessarily its semantic argument.

> Note: In chapter 6, I will discuss the syntax and semantics of Wijler sentences, and show that the DP/PP immediately following the adverb consists of the *lexical part of the syntactic argument* of the adverb, and it is not in itself the argument. However, for the present discussion, I assume that the DP/PP is the syntactic argument of the adverb, and therefore that it is also its semantic argument.

[B] Association with part of the semantic argument comes about pragmatically.

[C] There isn't any other additional mechanism which effects 'association' in Wijler sentences.

On this analysis, the only thing relevant to 'association' which is grammatically encoded in the Wijler construction is that, due to [A] above, the semantic argument of the adverb is the DP or PP following it. If we abstract away from factors such as contextual domain restriction, then applying the adverb to its argument would invariably result in a semantic interpretation where the adverb is intuitively 'associated' with that argument. But, as stated in [B] and illustrated below, association with part of the semantic argument in Wijler sentences may come about pragmatically. My claim is that the semantic relation between the adverb and the following DP/PP and pragmatic factors taken together provide a satisfying account for the generalization that what we intuitively identify as the 'associate' in a Wijler sentence must be the DP/PP or part of it.

Let us take an example. Consider (48). Let us assume that the syntactic argument of *lo* in Infl is IP, and its semantic argument is therefore an expression of type t (leaving the details of the semantic derivation to the next chapter).

(48) ben lo azar   le-lisa leha'amis et   hasxora
      Ben not helped to-Lisa to-load   Acc the-merchandise

The semantic argument of *lo* in (48) is the prejacent (Ben helped Lisa with the merchandise), and so the sentence means that *it is not the case that Ben helped Lisa with the merchandise*. If there are no additional factors affecting the interpretation, then the interpretation above is all we understand from hearing the sentence. This seems as it should be: the semantics alone determines just that the adverb comments on its semantic argument. So, intuitively, the adverb 'associates' with its entire argument. However, pragmatic considerations may lead the hearer to conclude that it is a particular ingredient of the negated proposition which makes it false. For instance, pragmatic considerations may lead the hearer to the conclusion that the **reason** that the entire prejacent of (48) is negated is rooted in the fact that Lisa is not the person Ben helped. This interpretation is what we intuitively identify as 'association' of *lo* 'not' with *Lisa*.

I would say that this sort of pragmatic association arises in a context where part of the scope of the adverb is in some sense 'given' in the discourse. For instance, suppose that it is clearly assumed in the common ground that Ben helped someone load the merchandise (in such a situation the adverb and *Lisa* are likely to carry the only two pitch accents in the utterance). But that means that what makes the IP incorrect can't be that Ben didn't helped with the loading, or that what Ben helped load was not the merchandise, etc. The only thing that could still make the IP incorrect is the fact that the individual he helped was not *Lisa*. This would lead the hearer to interpret sentences (48) as in (48'):

(48') Lisa was not the person whom Ben helped load the merchandise

Thus, the hearer would judge, intuitively, that the adverb associates with the indirect object DP. Such a context is often signaled by a nuclear accent on *Lisa*, and the association is therefore often referred to as association with focus.

In fact, Rooth 1992 analysis of the association of *only* with focus works in the same way. He takes the semantic argument of *only* in Infl to be the VP, but the pragmatic process of domain selection determines that what *only* comments on (its 'associate') may be just a part of that VP.

Let us now look at association in a Wijler sentence. Consider (47), repeated below.

(47) ben kana rak et hasefer Sel hemingway
      Ben bought only acc the-book of Hemingway

I assume that because the semantic argument of *only* in (47) is *Hemingway's book*, (47) asserts that the only (contextually relevant) **thing** that Ben bought is Hemingway's book. Therefore, if the domain of quantification of *only* is not restricted any further, we intuitively say that the 'associate' of *only* is it entire DP argument. But suppose we utter (47) in a context in which it is 'given' that Ben was buying books. It would make sense to assume that the domain of quantification consists just of books, yielding the interpretation that **every book** that Ben bought is Hemingway's book; this is the reading on which we would intuitively say that the adverb associates with the PP *of Hemingway*. Similarly, if it is presupposed in the context that Ben was in an auction where they sold Hemingway's belongings, it would make sense for the domain of quantification to contain only belongings of Hemingway's, in which case we would understand the sentence to mean that the **every one of Hemingway's belongings** that Ben bought is Hemingway's book (the adverb intuitively associated with *book*). Normally in a context in which all is presupposed except for one expression (e.g., *Hemingway*, or *book*), that expression would be assigned the only accent. When fixing the domain of quantification we rely on whatever information we have about the context. Faced with an out of the blue sentence, intonation is our only clue, and it biases our assumptions about the context, which consequently biases our choice of the domain of quantification. Thus if the intonation provides a clue suggesting that the sentence is uttered in a context in which the fact that *Ben bought a book* is part of the common ground, in some sense[20], then the hearer may use that knowledge to identify the domain of quantification (or what it is that makes a given proposition *false* (negation), contra belief (DAVKA), etc.). Thus,

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[20] It is predictable or inferable from the common ground in some sense (see Kadmon 2011 for elaboration and a a precise definition).

pragmatic association is determined solely based on **contextual information**, and intonation plays an important role in providing clues for that information.

Chapter 5: Syntax and Semantics in Adverb Grammar

In this chapter I discuss the hypothesis that the semantics of adverbs is compositional, in other words, the semantics of adverbs is dependent on their syntax. I refer to this hypothesis as the compositionality hypothesis (Jackendoff 1972, McConell-Ginet 1982, Wyner 1994, Cinque 1999, Tenny 2000, Ernst 2002, 2007, Shaer 2003, Costa 2003, among others). I will present an argument against this hypothesis, and counterarguments defending it. Finally, I will show that Wijler sentences provide empirical support for the compositionality hypothesis. I will then turn to two leading theories which assume that the compositionality hypothesis is true. Cinque's (1999) theory according to which universal syntax defines fixed syntactic positions for adverbs,

according to their semantic properties. By contrast, Ernst's (2002) model of adjunction states that adverbs are syntactically unbounded, but that a syntactic argument is always a semantic argument. Adjunction of an adverb is restricted to projections whose semantic denotation can be a semantic argument of that adverb. I will discuss the proposals made in these theories concerning configurations similar to Wijler sentences.

McConell Ginet 1982 presented empirical evidence supporting the compositionality hypothesis . Consider:

(1) a Luisa rudely departed
     b Luisa departed rudely

MecConell-Ginet observes that when the adverb *rudely* is adjoined outside the VP (above it), as in (1a) it is interpreted as a comment on the event, asserting that it was rude of Luisa to depart, but when it is adjoined within the VP, as in (1b), the adverb modifies the event, specifying that the manner in which Luisa departed was rude. McConell-Ginet's generalization is that adverbs within the VP restrict the range of *the events that are referred to*; whereas, adverbs above the VP, take the event, and comment on it. The syntax-semantics interface was also invoked in accounts of the syntactic restrictions on the relative ordering among adverbs from different semantic classes (examples are from Ernst 2007: p. 1009).

(2) a She frankly has probably not thought about it
     b *She probably has frankly not thought about it
(3) a Luckily, Gretchen had cleverly been reading up on local customs
     b *Cleverly, Gretchen had luckily been reading up on local customs

The distinctions among the adverbs that are relevant to their ordering are semantic distinctions. *Frankly* is a speaker-oriented adverb, describing the speaker's attitude towards the proposition; *probably* is a modal adverb characterizing the probability of the described event to occur. The observation in (2) is that speaker oriented adverbs must precede modal adverbs. Similarly, in the observation in (3) is that evaluative adverbs like *luckily*, must precede subject-oriented adverbs like *cleverly*. Assuming that the ordering is a syntactic fact implies that this phenomenon belongs to the syntax-semantics interface.

Theories of adverb grammar have varying goals; McConell-Ginet 1982 is interested in the interface between semantic representation and syntax (LF), as reflected in adverb grammar. Ernst 2002 and Shaer 2003 join this enterprise, but Ernst also aims to formalize a theory of the grammar of adjunction including its syntax and its interface with semantic and phonological forms. Cinque 1999 uses phenomena in adverb grammar to propose a theory of the universal structure of the clause. He argues that adverbs are specifiers of functional projections, and uses adverb grammar as evidence for a universal complex structure of functional projections between the VP and CP. Tenny 2000 joins Cinque's main objective, but reduces the number of functional projections, based on semantic considerations. The theories also vary in the relative role they assign to syntax and semantics in adverb grammar. Cinque 1999 claims that the syntax of adverbs is fixed, and therefore the semantics of adverbs is dependent on it, while Ernst 2002 assumes that the syntax of adverbs is unbounded and that restrictions are determined solely on the basis of the interfaces with semantics and phonology. McConell-Ginet 1982, Shaer 2003 and Tenny 2000 all present intermediary views on this issue, where the syntax of adverbs is relatively unbounded, but not completely, and the semantics determines some aspects of adverb positioning but not all. Wyner 1994 rejects the compositionality hypothesis altogether, and argues for a syntax-free model where the positioning of adverbs is almost unrestricted, and their interpretation is independent of their syntactic position. The chapter is organized as follows: in Section 5.1, I discuss Wyner's syntax-free 1994 model of adverb interpretation and a criticism provided by Shaer 2003. and show that the Wijler sentences provide strong empirical evidence against Wyner's model, favoring the compositionality hypothesis. Section 5.2 is dedicated to theories adopting the compositionality hypothesis. In Section 5.2.1, Ernst's adjunction model (2002, 2007), and a relaxation suggested by Shaer 2003. I will then present Ernst's ideas concerning the syntax of adverbs in Wijler sentences, and it cannot account for this phenomenon. In Section 5.2.2, I present Cinque's 1999 model of adverbs as specifiers of functional projections, and a relaxation suggested by Tenny 2000. I then turn to Cinque's speculations regarding the syntax of adverbs in Wijler sentences, and show that it cannot account for this phenomenon, as well. In Section 5.3, I conclude, arguing that the

empirical facts about Wijler sentences support the compositionality hypothesis, however that theories on that line do not have the syntax or the semantics to explain them.

5.1 Syntax Free Model of Adverb Semantics (Wyner 1994) and Shaer's (2003) Response

From McConell-Ginnet 1982 and onwards, most theories of adverb grammar assume that the semantics of adverbs is determined relative to their syntactic position, and they are positioned only where they can be interpreted. Wyner argued that the compositionality hypothesis is empirically wrong, in that adverbs are interpreted based on their lexical semantics, independent of their syntactic positions. Shaer 2003 reviews some of Wyner's arguments and argues in favor of the compositionality hypothesis .

5.1.1 Syntax Free Model – (Wyner 1994)

Wyner 1994 provides examples showing that the syntax-semantics association theory is empirically not valid.

(4) a Rudely, Luisa departed
     b Luisa departed, rudely
(5) a Eddie, very quickly, probably got bored
     b Eddie probably got bored very quickly

The observation in (4a) and (4b) is that the adverb can have both the 'comment on the event' and the 'event modification' interpretations when it is adjoined to either IP (4a) or VP (4b), and this observation falsifies theories based on the McConell-Ginet 1982 generalization. In (5a) and (5b) the observation is that the relative ordering between manner and modal adverbs may be reversed, and according to Wyner this change yields no effect on grammaticality or interpretation.

The adverbs in (4a-b) and (5a) are necessarily accompanied by comma intonation. Theories in the compositionality hypothesis rely on this intonation pattern, and take them to be parentheticals. They claim that they are a special case that does not enter the paradigm. However, without a theory of the grammar of parentheticals, this amounts to

the claim that the parentheticals are a counterexample to the model. What is missing is a theory of the parentheticals that would not assign interpretative effect to their syntactic position.

Another piece of data that poses a problem for the compositionality hypothesis relates to adverbs for which the McConell-Ginet generalization fails to apply, since they can show up in both positions with no semantic distinction.

(6) a Kim had passionately kissed Sandy

b Kim had kissed Sandy passionately

Paraphrase of (6-a-b): Kim kissed Sandy and he was passionate about it[21]

(7) a He shuffled the papers loudly

b He loudly shuffled the papers

Paraphrase of (5a-b): He shuffled the papers and it made a loud noise

Assuming McConell-Ginet's claim about the interpretative impact of the VP and above-VP positions, the prediction is that adverbs should either change the interpretation in the two positions, or that they would be licensed only in one of them, appropriate to their fixed interpretation. For example, the adverb *passionately* in (6) would be licensed only above the VP, because it comments on the event, and the adverb *loudly* in (7) would be licensed only as a VP adjunct, since it modifies the event. The syntactic variation with no apparent semantic impact is counterevidence to the compositionality hypothesis. In this case there is no special intonation, so there is no way for the compositionality hypothesis to exclude these cases from the theory[22].

The distinction between the adverbs in (6) and (7) and *rudely* seems to be that the adverbs in (6) and (7) are semantically rigid, and are therefore unaffected by the change in syntactic position.

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[21] Nirit Kadmon (pc) holds that the paraphrase should be with manner modification, rather than a comment on the event. It could be true, but it is hard to determine because the distinction is blurred, for these adverbs.
[22] Note that assuming that both occurrences of the adverbs are adjoined to the VP does not solve the problem, since the McConell-Ginet prediction is that they can be positioned higher, with a distinct interpretation.

Wyner argues that examples like the parentheticals and the semantically 'rigid' adverbs refute the compositionality hypothesis. He argues that each adverb contains its semantic interpretation in the lexicon, and that adverb interpretation is independent of adverb syntax.

5.1.2 Arguments for the Compositionality Hypothesis – (Shaer 2003)

Shaer 2003 claims that the set of data explained by the compositionality hypothesis is robust, and an alternative model would have to possess a special mechanism to account for the McConell-Ginet's generalization and the restrictions on the relative ordering of adverbs, making it much less appealing. He offers an account of the syntax-semantics of the parentheticals, and he provides evidence showing that the semantically "rigid" adverbs do show the effects of the McConell-Ginet 1982 paradigm, thus explaining away both counterexamples.

In order to account for the parentheticals, Shaer draws on the idea of a syntactic disjunct (McCawley 1982). McCawley identified a class of expressions, as syntactically disjoint from the sentence. The disjuncts discussed by McCawley include speaker-oriented adverbials like *frankly*, appositive relative clauses, parentheticals and afterthought expressions of different categories. McCawley used evidence from VP anaphora, to establish that these elements are syntactically disjoint from the sentence.

(8)   John talked, of course, about politics and Mary did too
        = Mary talked about politics too
        ≠ Mary talked of course about politics too

(8) shows that despite the fact that the parenthetical expression *of course* appears within the VP, it is not considered as part of it, for VP anaphora. Shaer uses VP anaphora as a diagnostic to establish that all adverbs with comma intonation are disjuncts, including parentheticals, afterthoughts, fronted adverbs and speaker-oriented adverbs.

(9)   a   Passionately, John chose love over happiness, and Mary did too

        = Mary chose love over happiness too

        ≠ Passionately, Mary chose love over happiness too

   b   John, passionately, chose love over happiness, and Mary did too

        = Mary chose love over happiness too

        ≠ Mary, passionately, chose love over happiness too

   c   John chose love over happiness, passionately, and Mary did too

        = Mary chose love over happiness too

        ≠ Mary chose love over happiness, passionately, too

   d   Luckily, John chose love over happiness, and Mary did too

        = Mary chose love over happiness too

        ≠ Luckily Mary chose love over happiness too

Based on this diagnostic, Shaer argues that comma intonation signals a syntactic status of a disjunct. Syntactic disjuncts are semantically interpreted outside the proposition, and are correctly predicted to be interpreted based on their lexical properties alone. This accounts for Wyner's examples with parentheticals, leaving only the challenge of the semantically 'rigid' adverbs.

Following McConell-Ginet 1982, Shaer 2003 argues that the VP, and positions above the VP, carry different interpretational content; therefore, in many contexts they are interpreted differently (see (1) above). The reason for the seemingly semantically 'rigid' adverbs is that the meaning distinction is neutralized. In order to establish this claim, he provides contexts where the distinction does show up with the semantically so-called 'rigid' adverbs.

    (10) a   Kim emotionlessly kissed Sandy passionately

          b   #Kim passionately kissed Sandy emotionlessly

(10a-b) shows the effects of the McConell-Ginet paradigm on the allegedly 'rigid' adverb *passionately* when it is used with the contradicting adverb *emotionlessly*. In (10a) the adverb *emotionlessly* makes a comment on an event of kissing which is further modified with the adverb *passionately*. (10a) sounds natural because it is easy to think of a context

(e.g., a theater play) in which the kissing would be modified as passionate, though the kisser was emotionless about it.

The reason that (10b) is odd is that it is much harder to think of a context where Kim is passionate about kissing Sandy when his kiss reflects no emotions. This contrast shows that *passionately* is not semantically 'rigid', and that it displays the predicted syntax-semantics association effects. The reason for the fact that in most contexts the meaning distinction is neutralized is that we tend to assume that one's true feelings are reflected in the act that she performs. Another seemingly 'rigid' adverb is *loudly*.

(11) a the prisoner loudly proclaimed his innocence

      i   # He woke up all the other prisoners

      ii   He really believed that he has been framed

    b the prisoner proclaimed his innocence loudly

      i   He woke up all the other prisoners

      ii   # He really believed that he has been framed

The acceptability contrasts in (11a-b) show that *loudly* displays the effects of the McConell-Ginet generalization. The adverb in the clausal position in (11a) makes a comment about the frame of mind of the agent in the described event. It is therefore compatible with the prisoner's proclamation, but there is no implication that the event was characterized by a loud noise, and therefore the sentence is less appropriate in a context implying that the event's high noise woke up people. The adverb in the lower position (11b), adds a manner modification to the event, as predicted by McConell-Ginet's analysis. It is therefore compatible with creating noise through the manner of the act, and less so with a description of the agent's frame of mind, which has nothing to do with loud noise. Thus, Shaer shows that the compositionality hypothesis is valid, and that Wyner's apparent counterexamples can be explained within the framework.

5.1.3   Wijler Sentences in a Syntax Free Model

Prima facie, the alternation between Infl. sentences and Wijler sentences could be used as further evidence for Wyner's model, because the adverbs are found out of their 'normal' syntactic position, but since there are semantic distinctions characterizing the

alternation, it is in fact, an evidence for compositionality hypothesis. There is no reason why certain interpretations are blocked in Wijler sentences, when they are possible in Infl. sentences with the same associate. For example, it cannot account for for the exhaustivity effects with *tamid* 'always' (12b), or for the existential entailment with anti-veridical adverbs *lo* 'not' and *kim'at* 'almost', illustrated for *kim'at* almost in (13b).

(12) a   hu metaken tamid et <u>ha-mexonit hayeruka</u>, #ve gam et hakxula
          he fixes always acc the-green car, and also acc the-blue (one)

      b   hu metaken tamid et <u>ha-mexonit hayeruka</u>, #ve gam et hakxula
          he fixes always acc the-green car, and also acc the-blue (one)

(13) a   haxec kim'at paga <u>bamatara aval basof hu lo paga beklum</u>
          The arrow almost hit the target, but at the end it not hit nothing

      b   haxec paga kim'at <u>bamatara aval basof hu lo paga beklum</u>
          The arrow hit almost the target, #but at the end it not hit nothing

Moreover, there is no way in the syntax free model, to account for the inferences introducing the speaker's point of view in these configurations.

(14) a   ben davka hexna et hamexonit <u>al maavar haxacaya</u>
          Ben contra belief parked acc the car on the pedestrian crossing

There is no inference regarding the speaker's views about the sentence

      b   ben hexna et hamexonit davka <u>al maavar haxacaya</u>
          Ben parked acc the car contra belief on the pedestrian crossing

Inference: the speaker considers it wrong of Ben to park where he did

To conclude, the motivation for the syntax free model of adverb grammar was to account for cases in which adverbs appear in distinct syntactic positions with no effect on their interpretation. Shaer 2003 supports the compositionality hypothesis, providing a theory to account for the relative freedom of the parentheticals, and showing that the allegedly semantically 'rigid' adverbs are semantically affected by their syntactic position.

Finally, I showed that the syntax-free model also fails to account for Wijler sentences, which constitute an empirical support for the compositionality hypothesis, to we turn now.

5.2. Compositionality hypothesis

There are two kinds of theories accepting the compositionality hypothesis , one claiming that adverbs are specifiers of functional projections (originated by Cinque 1999), and the other claiming that adverbs are syntactic adjuncts (originated by Ernst 2002). The Functional-specifier model predicts that there can be at most one adverb for each category, and that each category syntactically selects only adverbs from a given semantic class. The adjunction model allows for more flexibility in the matching of syntactic positions and interpretations, because there can be a number of adjuncts piling up one on top of the other in one projection, and adjuncts can precede or follow the modified projection. Ernst derives the restrictions on the syntax of adverbs from the interfaces with semantics (LF) and phonology (PF), in accordance with the Minimalist framework (Chomsky 1995 and subsequent studies). The main challenge for Cinque's 1999 Functional-specifier theory is found in cases in which adverbs show in more than one position with no real change of interpretation. The challenge for Ernst's 2002 unbounded adjunction theory is to account for the regularities in adverb syntax, and its fixed correlation with functional elements in the grammar. I begin with Ernst's model of unbounded adjunction, and a relaxation of it, as proposed by Shaer 2003.

5.2.1 Unbounded Adjunction Model (Ernst 2002, 2007) and a Proposed Relaxation (Shaer 2003)

5.2.1.1   Unbounded Adjunction in Adverb Syntax – (Ernst 2002)

Ernst 2002 argues that adverbs are syntactic adjuncts, and that adjunction is syntactically unbounded. This implies that adjuncts can precede or follow the adjoined projection; there can be numerous adjunctions to a given projection; and adjuncts are not syntactically restricted to a unique projection.

Ernst assumes the Minimalist Program (Chomsky 1995 and subsequent studies) and argues that the restrictions on the distribution of adverbs follow from the interfaces with phonology (PF) and semantics (LF), and the general principles of UG. The position of VP-modifiers is determined by the Head Parameter, so that VP adverbs are ordered on

par with complements. Thus, VP adverbs in VO languages are predicted to follow the verb, and VP adverbs in OV languages are predicted to precede it. This generalization is true for Hebrew, which is a VO language, and its VP modifiers follow the verb.

(15) a Max cava et ha-bayit bimhirut
          Max painted acc the-hous quickly

      b *Max bimhirut cava et ha-bayit
          Max quickly painted acc the-hous

In addition to the Head Parameter, Ernst assumes a rightward dislocation applying after PF spell-out, which is motivated by prosodic weight. This would account for heavy NP shift.

(16) a *Max ate rapidly the apple

      b Max ate rapidly the apple that Mary gave him yesterday

In order to derive other restrictions on the syntax of adverbs, Ernst argues that an adverb must be semantically interpretable with the projection to which it is syntactically adjoined. He assumes that in the interface between syntax and Semantic Representation (LF), adverbs must c-command the modified projection, and that the Semantic Representation determines whether or not they can be interpreted in a given position.

5.2.1.2 Semantic Interpretation Model (Ernst 2002) and the FEO

The basic elements of Ernst's model are FACT, EVENT, and OBJECT. OBJECTs and verbs are combined yielding EVENTs, which can then be converted to propositions and FACTS (i.e., true propositions). This is a semantic processing system, which he calls the FEO calculus. The FEO contains semantic rules to convert an EVENT to a proposition, and a proposition to a FACT.

In addition he defines COMPLEX EVENT and COMPLEX PROPOSITION, resulting from the application of a semantic element (e.g., an adverb) that does not affect the semantic type. The FEO calculus allows conversion only from the bottom up, i.e., an EVENT can be converted to a PROPOSITION, but not vice versa. Crucially, the FEO allows flexibility in the syntax-semantics association of adverbs. The conversion to

EVENT occurs at the PredP (analogous to Chomsky's *v*P, containing the VP and the trace of the subject), but the conversion from EVENT to a PROPOSITION may occur in different clausal projections up to IP. The implication of this is that the clausal projections up to IP allow modifiers of both EVENTs and PROPOSITIONs, provided that the appropriate semantic object is accessible.

In order to make the model clear, let us start with an example of an FEO analysis of a sentence with no adjuncts.

> (17)   Theo bought flowers

(i) **Conversion of *verb* and *arguments* to an EVENT:** $\exists e \; [B(e) \wedge Agt \; (e,t) \wedge Th \; (e,f)]$

   i.e., There is an EVENT, which is a *buying* event, and its agent is *Theo* and its theme is *flowers*.

(ii)   **Conversion of EVENT to PROPOSITION**:

   $\exists p \; [\; p \; asserts \; that \; \exists e \; [B(e) \wedge Agt \; (e,t) \wedge Th \; (e,f)]]$

   i.e., There is a PROPOSITION asserting that there is an EVENT, which is a *buying* event, and its agent is *Theo* and its theme is *flowers*.

Ernst proceeds to illustrate the way in which the relative ordering of facts are derived within his model, using the case of an agent-oriented adverb *cleverly* and a modal adverb *probably*.

> (18) a   Theo probably cleverly bought flowers
>   b   *Theo cleverly probably bought flowers

The descriptive generalization regarding (18) is that the modal adverb *probably* must precede the agent-oriented adverb *cleverly*. In Ernst's model these two adverbs are licensed in the same syntactic positions i.e., all clausal positions. The restriction on their relative ordering comes from the semantic rules by which they are interpreted. Let us start with the agent-oriented adverb *cleverly*.

Adverbs like *cleverly* are found in the McConell-Ginet 1982 paradigm, allowing a manner interpretation and an interpretation of a comment on the event (cf. (1a): *Luisa rudely departed* vs. (1b): *Luisa departed rudely*). Ernst argues that in each of the readings of the adverb (manner or comment), in (1a) and (1b) there is something in Luisa's

behavior in the described event that is qualified as *rude*. According to Ernst, agent-oriented adverbs take two arguments: the EVENT and its AGENT. For example, in (1) *rudely* takes the EVENT of *Luisa's departure*, as one argument, and its agent *Luisa*, as its second argument. The semantic rule deriving the interpretation of such adverbs in the clausal position (as in 1a) is presented in (19).

(19). *Semantics for Agent[23] oriented adverbs (higher position)* (his 2.39: p 55):

    a. $ADV(e) = e$ [$_{REL}$ warrants positing] P_{ADJ} in agent

    b. P_{ADJ} (e, Agt)

(19a) states that relative to other events ($_{REL}$), the discussed event warrants positing the property denoted in the corresponding adjective, in agent. In (1a) it would be that relative to other events, the event of '*Luisa's departure*' warrants positing the property of being *rude*, in *Luisa*. (19b) states that the property is posited onto the agent of the event. Bearing this analysis in mind, we now return to the mapping of the agent-oriented adverb from the syntax to Semantic Representation.

(20) Theo cleverly bought flowers

In (20), the adverb *cleverly* takes two semantic arguments: the EVENT of *Theo buying flowers,* and its agent *Theo.* Applying the semantic rule (19a-b) results in a COMPLEX EVENT, in which *Theo* is the agent of the event of *Theo bought flowers*, and this event warrants positing the property denoted by the adjective *clever* in *Theo*, relative to other events, i.e., Theo was clever to act as agent in the event of *Theo's buying flowers*. Now let us turn to the modal adverb *probably*.

(21) Theo probably bought flowers

The modal epistemic adverb *probably* takes PROPOSITION as its only argument, and the result of its application is a COMPLEX PROPOSITION, asserting that the original PROPOSITION is probable. In (21) the adverb *probably* takes the PROPOSITION,

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[23] For the purposes of this rule, Ernst defines *agent* to include more than the thematic agents, and his definition refers to entities that can control the eventuality, in that they can choose not to do some action, enter into a state, and so on (e.g., *John* in the sentence *John lay in bed*, is an agent in the intended sense, because he could choose to lie in bed).

asserting that there was an EVENT of *Theo buying flowers*, and gives a COMPLEX PROPOSITION, asserting that it is *probable* that this PROPOSITION is true. According to Ernst, both higher agent-oriented adverbs and modal adverbs can be adjoined in all clausal projections. The EVENT, its agent and the PROPOSITION can be made accessible in these positions, because PredP denotes an EVENT, which can be converted to a proposition, at any syntactic position above PredP. The two adverbs are semantically interpretable (in whatever clausal projection they occur in), provided that the proper semantic object is accessible, i.e., for modal adverbs this requires conversion to a proposition, and the agent-oriented adverb requires the EVENT, denoted by PredP. Since Ernst does not assume a restriction on the number of adjuncts per projection, it follows that the two adverbs can be adjoined to the same projection, one above the other. Ernst assumes that when there is more then one adverb to a given projection, the adverbs are processed from the inside out, so that the adverb closest to the verb is the first one to be semantically processed, right after PredP. First, consider (22).

(22) Theo probably cleverly bought the flowers

(i) *The EVENT*: $\exists e$ [B(e) $\wedge$ Agt (e,t) $\wedge$ Th (e,f)]

i.e., There is an EVENT, which is a *buying* event, and its agent is *Theo* and its theme is *flowers*.

(ii) *Cleverly*:

$\exists e$ [B(e) & Agt (e,t) & Th (e,f) & e [$_{REL}$ warrants positing] P_{CLEVER} in Agt (e,t)& P_{CLEVER} is posited in Agt (e,t)]

i.e., There is a complex EVENT, which is a *buying* EVENT, and its agent is *Theo* and its theme is *flowers*, and this EVENT warrants positing the property denoted by the adjective *clever* in the agent *Theo*.

(iii) *Conversion of EVENT to PROPOSITION*:

$\exists p$ [p asserts that $\exists e$ [B(e) & Agt (e,t) & Th (e,f) & e [$_{REL}$ warrants positing] P_{CLEVER} in Agt (e,t)& P_{CLEVER} is posited in Agt (e,t)]]

i.e., There is a PROPOSITION asserting that there is a complex EVENT, which is a *buying* event, and this EVENT warrants positing the property denoted by the adjective *clever* in the agent *Theo*.

(iv) *Applying probably to the PROPOSITION*:

$\exists$p'[p' asserts that $\exists$p [p asserts that $\exists$e [B(e) & Agt (e,t) & Th (e,f) & e [$_{REL}$ warrants positing] P$_{CLEVER}$ in Agt (e,t)& P$_{CLEVER}$ is posited in Agt (e,t)] & p is probable]]

i.e., There is a PROPOSITION p', asserting that there is a proposition p asserting that there is a complex EVENT, which is a *buying* event, and its agent is *Theo* and its theme is *flowers*, and this EVENT warrants positing the property denoted by the adjective *clever* in the agent of the event *Theo*, and this PROPOSITION is *probable*.

There is no problem in applying either the rule for interpreting *cleverly*, or the one for interpreting *probably*, and Ernst therefore correctly predicts that (22) to be syntactically acceptable. Now let us see what happens when we choose the reverse order for the adverbs.

(23) #Theo cleverly probably bought the flowers

In (23), the modal adverb is the first to apply, but this requires the EVENT to be converted to a PROPOSITION. Once the agent-oriented adverb *cleverly* gets in, there is no accessible EVENT. The PROPOSITION cannot be converted backward to an EVENT, and therefore the sentence fails to be assigned semantic interpretation, and Ernst correctly predicts it to be unacceptable.

Let us return now to the McConell-Ginet 1982 paradigm. Ernst claims that agent-oriented adverbs form a lexico-semantic class, where each adverb semantically allows manner and agent-oriented interpretations. This makes the correct prediction that the ambiguity pattern is not a characteristic of a given adverb, but of a class of adverbs.

In order to account for the ambiguity, Ernst proposes an additional semantic rule applying to agent-oriented adverbs when they are adjoined to PredP. He introduces an additional

element of the FEO model, the Specified Event (SpecEvent), as the argument for agent-oriented adverbs in the manner reading, and he defines its correlation with PredP as part of the characterization of the FEO calculus[24].

(24)   *The FEO Calculus* (Ernst 2002: p. 50, his 2.25)

a.   Any FEO type may be freely converted to any higher FEO type, but not to a lower one, except:

b.   Any FEO (sub)type to another FEO (sub)type as required by lexical items or coercion operators.

c.   Events may be interpreted as specified events (SpecEvent) within PredP.

Ernst's system does not allow a direct matching between semantic rules and syntactic positions. A semantic rule can operate anywhere in the hierarchy, provided that there is nothing to block accessibility of the arguments it involves. However, when an adverb takes a SpecEvent as its argument the situation is different, because while the clausal FEOs can be accessible in all clausal projections, SpecEvent is accessible only in PredP. The manner rule deriving the PredP interpretation of agent-oriented adverbs is a semantic rule that instead of [$_{REL}$ *warrants positing*], as in the clausal semantic rule (19) has [$_{REL}$ *manifests*], and whose semantic argument is a *specified EVENT* (SpecEvent), instead of *EVENT*.

(25) *The manner rule*:

ADV (e) = e [$_{REL}$ manifests] P_{ADJ} in Agent

i.e., The event manifests the property denoted by the related adjective in the agent, relative to other specified events.

(26)   Luisa departed rudely   (repeated from (1b))

According to (25), (26) asserts that in the specified event of *Luisa's departure*, *Luisa* manifests the property of *being rude* more than in other specified events of *departure*. The comparison class for $_{REL}$ in the manner rule contains similar specified events with the same predicate, and the comparison class for $_{REL}$ in the rule for clausal agent-oriented adverbs contains other possible events with the same agent. We see then that Ernst

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[24] The properties of the specified event are defined in the semantic rules to be soon presented.

derives the McConell-Ginet paradigm based on one semantic rule with two versions. In the clausal version the adverb takes EVENT as its argument, and in the PredP version the adverb takes a SpecEvent as its argument.

To sum up, the unbounded adjunction model also predicts the relative ordering facts without having to assume that different adverbs are designated for specific syntactic positions, based on the accessibility of the semantic argument. Moreover, Ernst's model correctly predicts flexibility in adverb grammar, depending on the semantics of the adverbs. Adverbs taking an EVENT as a semantic argument (e.g., agent-oriented) can be placed in any clausal position, provided that they do not follow an operator requiring conversion of the event to a proposition. Similarly, adverbs taking a proposition as their semantic argument can also appear in any clausal position, provided that the proposition has not been converted to fact, and adverbs taking a fact as a semantic argument (e.g., evaluative adverbs like *fortunately*), can also show up in any clausal projection, since a conversion from event to proposition, and from proposition to fact is always allowed. In the following section, I present Shaer's claim that the unbounded adjunction model is too strong to account for adverb grammar, and that it should therefore be relaxed to allow some syntactic information in adverb grammar.

5.2.1.2   Relaxation of Ernst's Model – (Shaer 2003)

Shaer 2003 adopts Ernst's main assumption that adverbs are syntactically less restricted then arguments, but he argues that there must be some syntactic properties of adverbs.

(27) a   Karen unfortunately ate cake spiked with whiskey
      b   Karen has unfortunately eaten cake spiked with whiskey
      c   * Karen has been unfortunately eating cake spiked with whiskey
      d   * Karen must have unfortunately been eating cake spiked with whiskey

Shaer claims that for many speakers (27c-d) are unacceptable despite the fact that according to Ernst 2002, they are semantically interpretable. Shaer argues that this is evidence that the syntax of adverbs is not completely unbounded, and that when an

adverb appears outside of its syntactically designated position the sentence would be odd, even when it is semantically interpretable.

Furthermore, Shaer shows that in some cases where Ernst's model predicts flexibility, comma intonation is necessary. In Ernst's model evaluative adverbs like *fortunately* and modal adverbs like *probably* can show up in the same syntactic positions. The modal adverb requires a PROPOSITION as its argument, and the evaluative adverb requires a FACT. Since propositions are convertible to facts at any position in the clausal structure, then both evaluative and modal adverbs can be interpreted at any position above PredP. In order to demonstrate this Ernst (1998) provided the following example, where the two adverbs seem to be in the same position.

(28) a   Eddie unfortunately left
         b   Eddie probably left

Shaer cites Taglicht 1998 that showed that English evaluative adverbs in non-initial positions require a comma intonation, as a rule, and Shaer claims that this intonation indicates that the two adverbs are not interchangeable. Assuming Shaer's 2003 analysis of comma intonation, this indicates that the adverb in (28a) is a syntactic disjunct, while the one in (28b) is adjoined to a clausal projection. Shaer argues that these facts indicate that Ernst's model must be relaxed, in order to admit some syntactic information (e.g., evaluative adverbs must be adjoined to a CP).

To conclude, Ernst's unbounded-adjunction model can account for some of the relative ordering data, and for the McConel-Ginet 1982 paradigm. His model is especially suited to account for syntactically flexible adverbs (e.g., time-quantificational adverbs). However, as Shaer 2003 shows, Ernst's model is incorrect in assuming that adverb syntax is completely unbounded, as is shown in the variations in judgments of semantically interpretable sentences, and in the ordering restrictions imposed on clausal adverbs. In the next section the possibility to account for Wijler sentences within Ernst's unbounded adjunction model will be explored.

5.2.1.3   Ernst's Unbounded Adjunction Model and Wijler sentences

Ernst's 2002 unbounded adjunction model states that adverbs can adjoin to any category, including nominal categories (DP) and prepositional categories (PP). The model determines that adjunction of an adverb is licensed if the adverb can take the semantic denotation of that argument as its semantic argument, and Ernst takes the flexibility of only as evidence that adverbs indeed can adjoin to any category.

(29) a   Ben introduced only <u>Sara</u> to Sally

     b   Ben introduced Sara only to <u>Sally</u>

(29a) and (29b) illustrate the possibility of only to linearly precede Sara or Sally. The associate of only in (29a) must be *Sara* implying that there is nobody other than Sara s.t., Ben introduced this person to Sally. Similarly, in (29b) the adverb is necessarily associated with the PP *to Sally*, implying that the only individual to whom Ben introduced Sara was Sally. Furthermore, there is evidence that the adverb and argument form a syntactic constituent.

(30) $[$rak et Sara$]_j$ hiclaxti lenaSek t_j
      only acc Sara managed-1st-sg to kiss (I managed to kiss only Sara)

Both these arguments are applicable to other adverbs in the Wijler sentences. As I showed above the adverb and argument are obligatorily associated in Wijler sentences (e.g., obligatory exhaustivity of *always*), and the adverbs and arguments can be fronted as a constituent:

(31) $[$tamid et haxulca hazot$]_k$ at omeret li lilboS t_k (from actual discourse)
      always this shirt you tell me to wear

Ernst explains this paradigm, assuming that the adverb is left adjoined to the DP (or sometimes to the PP). This would be possible in his model if the semantics of these adverbs is such that they can take the semantic type denoted by DP (an individual or a generalized quantifier) and a PP (whatever it may be) as its semantic argument. Let us turn now to another implementation of the compositionality hypothesis.

5.2.2   Functional-Specifier Model – (Cinque 1999, Tenny 2000)

The Functional-Specifier (henceforth F-specifier) model (Cinque 1999) determines that adverbs are syntactically positioned in the specifiers of functional projections. As such, they are not adjuncts and are restricted by the grammar both linearly and hierarchically. There is only one specifier per projection, so each adverb in a sentence occupies a specifier of a distinct functional projection.

In this model, the functional projections are hierarchically ordered by UG. Thus, the semantics is read off the structure, leaving no room for flexibility. The main challenge for this model is presented by adverbs occupying various positions.

5.2.2.1 Arguments for the Functional-Specifier Model – (Cinque 1999)

Cinque's (1999) main goal is to create a theory of the universal syntactic structure of sentences, and he uses adverbs as a diagnostic for this structure.

(32) a Luckily, Gretchen had willingly been loudly screaming at everybody.

b *Willingly, Gretchen had luckily been loudly screaming at everybody.

c *Loudly, Gretchen had luckily been willingly screaming at everybody.

d *Luckily, Gretchen had loudly been willingly screaming at everybody.

Cinque argues that grammaticality contrasts such as the one in (32) show that the ordering of adverbs is fixed in the grammar. The evaluative adverb *luckily* must precede the subject-oriented adverb *willingly*, which must precede the manner adverb *slowly*. The syntax of the grammatical (32a) would be analyzed as in (33) (omitting much of the structure for presentational purposes[25]).

(33)

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[25] In Cinque's model all functional heads automatically project as part of the universal structure of the sentence, so all projections exist for each sentence.

```
        advp              Man'
                    Man        VP
Luckily,∅ willingly   ∅   had   loudly ∅         /\
                                               /____\
                                                .....
```
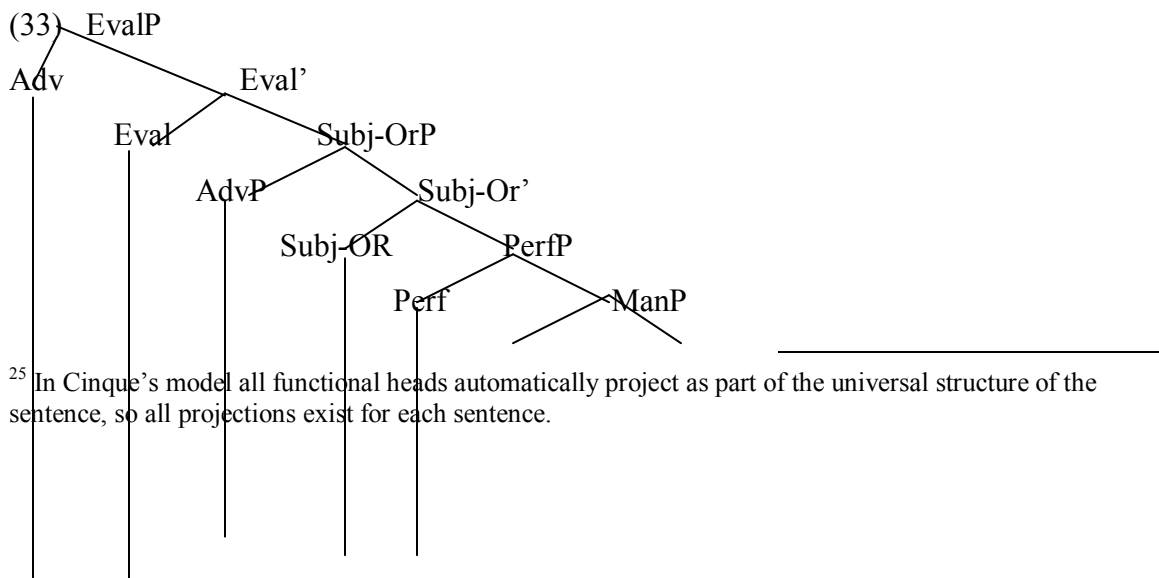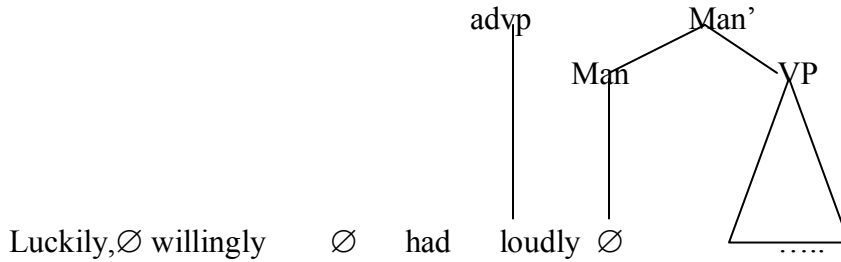
In (32a), represented in (33), all the adverbs are licensed in the appropriate specifier positions, and the derivation is correctly predicted to be grammatical. By contrast, in (32b), the manner adverb *loudly* is correctly positioned in the specifier of ManP, but the subject-oriented adverb *willingly* must be incorrectly positioned in the specifier of EvalP, and the evaluative adverb *luckily* must be incorrectly positioned in the specifier of SubjOrP. Cinque would claim that the head contains uninterpretable features that the adverb has to check off. The derivations of (32b-d) would each contain uninterpretable features that failed to be eliminated before LF, because the adverb did not match them, causing the derivation to crash.

Another type of evidence that Cinque provides for the F-Specifier model comes from the relative ordering of adverbs and different participles. Following Pollock 1989, Cinque assumes that adverbs do not move, so that if a participle can show up on both sides of an adverb, it implies that the participle had (optionally) moved over the adverb. The Italian adverbs *mica* 'not' and *piú* 'any longer' are both found on either side of the past participle.

(34) a Non hanno mica mangiato
        not they-have not(adv) eaten

     b Non hanno mangiato mica
        not they-have eaten not(adv)

(35) a Non hanno piú mangiato
        not they-have any-longer eaten

     b Non hanno mangiato piú
        not they-have eaten any-longer

According to Cinque, the two orders are a result of optional movement of the participle to a higher functional head. One could speculate that the two orders are a result of

adjunction to either side of the participle, but Cinque shows that this would make the wrong predictions, when both adverbs occur in the same sentence, as in (36).

(36) a   Non hanno mica mangiato piú
         not they-have not(adv) eaten any longer

     b   *Non hanno piú mangiato mica
         not they-have any longer eaten not(adv)

Cinque argues that a linearly unbounded adjunction model would wrongly predict examples like (36b) to be grammatical; *mica* is predicted to be licensed following the verb, on a par with (35b), and *piú* is predicted to be licensed preceding the verb as in (35a). Cinque accounts for the contrast in (36) based on the UG hierarchical order of the functional projections hosting the two adverbs. The projection hosting *mica* is hierarchically higher than the projection hosting *piú*, and therefore *piú* cannot precede *mica*. Cinque provides additional evidence for the proposed universal functional complex, from the cross-linguistic order of affixal morphemes. The following are Korean verbal affixes based on Sohn 1994:

- -hi – passive voice
- -si – subject honorific
- -ess – anterior or past tense (or anterior of past when duplicated)
- -keyss – conjectural (epistemic) modality
- -sup – addressee honorific
- -ti – evidential mood suffix, used to recall a fact that one has witnessed
- -kka – speech act mood of interrogative, contrasting with declarative –(t)a
  and other speech act moods

(37)   Ku pwun-i caphi-si-ess-ess-keyss-sup-ti-kka
       the person-NOM catch-PASS-AGR-ANT-PAST-EPISTEM-AGR-EVID-Q
      (Did you feel that he had been caught?)

(38)   Ku say-ka-cwuk-ess-keyss-kwun-a
       that bird-NOM die-ANT-EPISTEM-EVALUAT-DECL
      (That bird must have died)

Cinque uses Baker's 1996 Mirror Principle to establish that the order of the affixes reflects a structure in which the morphemes are positioned such that the morpheme

closest to the head reflects the lowest functional head, and so on. In (37), the speech-act suffix is at the right edge of the verb, preceded by the modal epistemic adverb, and this shows that it corresponds to a head higher in the tree. The two suffixes are intervened by an evaluative suffix in (38), just as modal epistemic adverbs and speech-act adverbs allow evaluative adverbs between them. Cinque's Functional-Specifier (F-specifier) theory accounts for the relative ordering of adverbs, the relative ordering of morphemes and the cross-linguistic correlation between the two phenomena.

We now turn to Cinque's account of the McConell-Ginet 1982 paradigm.

(39) a   Luisa rudely departed

b   Luisa departed rudely

On the F-Specifier model, the two orders reflect two structures, with *rudely* in the specifier of Subj-OrP in (39a), and in the specifier of ManP in (39b), as illustrated in (40a-b) below. (As before, I simplify the structure and draw only the projections relevant to the phenomenon).

(40) a.

Luisa   rudely₁   ∅   ∅   departed

(40) b.

```
          Advp        Man'
                   Man      VP
                    |      /\
Luisa             ∅  rudely₂ ∅  departed
```
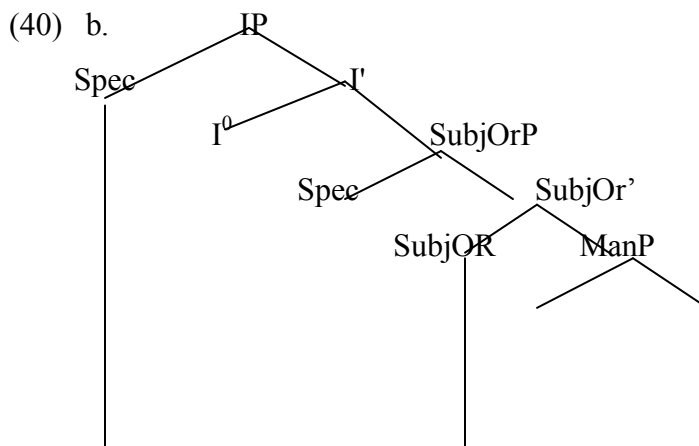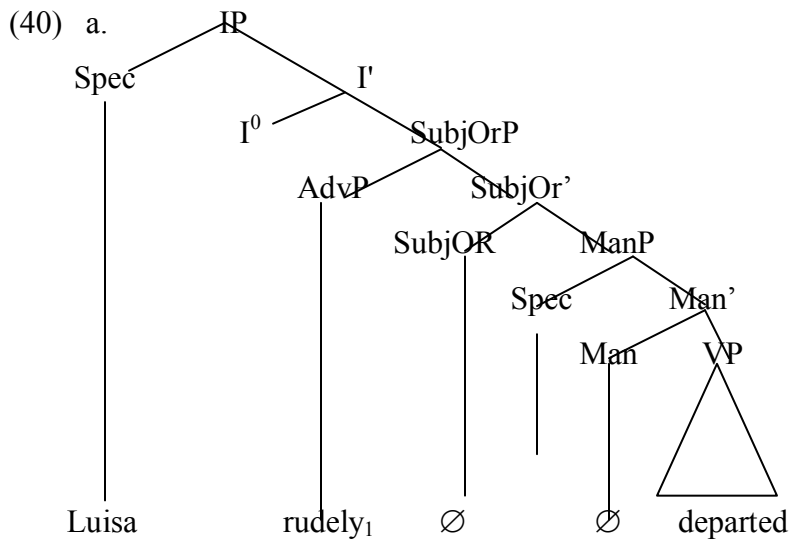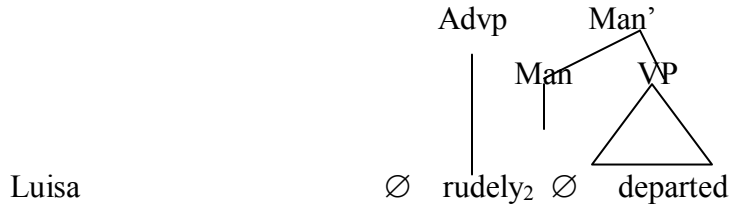
In the F-specifier model each adverb is licensed only in the specifier of one functional projection, and there is no option for one adverb to be licensed in two different projections. Hence Cinque argues that *rudely* is lexically ambiguous, with one lexical entry for each reading, thus deriving the paradigm from lexical ambiguity.

To sum up, Cinque's F-Specifier model can explain the relative ordering data and the McConell-Ginet 1982 paradigm; it also accounts for the correlations between the relative ordering of adverbs, and of functional morphemes. In addition, Cinque accomplishes his goal and provides a universal functional structure of sentences based on a cross-linguistic study of adverbs and functional morphemes.

5.2.2.2 Problems with the F-specifier Model

The F-specifier model offers a theory of the functional structure of sentences, and this theory accounts for adverb grammar as a bonus. The main challenge that it encounters in adverb grammar is presented by the syntactic flexibility shown by some adverbs. Let us first focus on McConell-Ginet's 1982 paradigm. According to Cinque, adverbs like *rudely* or *cleverly* are lexically ambiguous between the Manner and Subject-oriented interpretations. The phenomenon is general, and given Shaer's 2003 account of the alleged semantically 'rigid' adverbs, we can predict that all manner adverbs show the effects of this paradigm. Cinque's theory misses this generalization, since it describes the generalization as a series of arbitrary ambiguities, making no prediction about them. Ernst 2007 raises another problem to the F-Specifier model, involving frequency adverbs. He shows that frequency adverbs can be found in various positions preceding or following adverbs from different semantic classes, in contrast with the prediction of the F-specifier model, that there is only one possible position for each adverb (Ernst 2007: pp. 1017-8).

(41) a She frequently has wisely gone there on Sundays

b She wisely has frequently gone there on Sundays

As we have seen in section (4.2.1.1) Ernst accounts for this based on the semantics of frequency and agent-oriented that take an EVENT as their argument. Ernst (2007) argues that this would force the F-Specifier model to assume lexical ambiguity where the lexical entries differ only in the position in which they are syntactically allowed. In addition, Cinque would have to assume corresponding functional projections, for FREQ1, FREQ2 etc, which would also unnecessarily complicate the theory of the universal clause structure.

The theory, thus, looses explanatory power, since it has no prediction about the adverbs showing multiple ambiguities, or the kinds of functional projections, which are multiplied.

To sum up, the problems with the F-specifier model stem from the claim that each adverb is appropriate for one functional projection. This claim is incongruous with adverbs displaying syntactic flexibility. The ambiguity analysis of the F-specifier model misses the generalization underlying the McConell-Ginet's paradigm, and the generalization underlying syntactic flexibility among some semantic classes of adverbs. In the next section we will discuss Tenny's (2000) relaxation of the F-specifier model.

5.2.2.3 Relaxation within the F-Specifier Model – (Tenny 2000)

Tenny[26] 2000 adopts Cinque's idea that adverbs convey information about the functional structure of the sentence. She argues for a reduced number of functional projections motivated independently by semantic considerations; the functional complex she assumes is sketched in (42) below:

(42) [Point of view [Deictic time [Truth value [Subject oriented [Middle Aspect Core events]]]]]]

---

[26] The main claim of Tenny 2000 regards the inner structure of the VP, which is omitted here for presentational purposes.

The reduced number of functional projections implies that there are larger classes of adverbs corresponding to each projection.
For example:

(43)   'Point of view': *frankly* (speaker oriented), *fortunately* (evaluative), *allegedly* (evidential) and *probably* (epistemic modal).

Each of these adverbs is assigned to a distinct functional projection in Cinque's model, in order to account for the relative order among them.

(44) a   She frankly has fortunately ignored him
     b   *She fortunately has frankly ignored him
(45) a   Fortunately, Janet probably forgot to read my paper
     b   * Probably, Janet fortunately forgot to read my paper
(46) a   She frankly has probably not thought about it
     b   *She probably has frankly not thought about it

The grammaticality contrasts in (44) – (46) show that the adverbs hosted by Tenny's 'Point of View' projection, must be ordered with respect to one another: The speaker-oriented adverb *frankly* must precede the evaluative *fortunately* and the epistemic modal *probably*, must follow both the speech-act *frankly* and the evaluative *fortunately*. Tenny argues that order regulations within a given projection are to be accounted for by semantic considerations. Tenny does not specify the considerations, but she says that a system along the lines of Ernst 2002 could work. Furthermore, under Cinque's assumption that there is one specifier per projection, the reduction of the number of functional projections also eliminates the possibility of assuming that adverbs are specifiers, or else the model would wrongly rule out (44a), (45a) and (46a). Tenny's model is situated in between Cinque's 1999 'F-Specifier' model and Ernst's 2002 'Unbounded adjunction model'. She retains the F-Specifier idea of the relevance of adverb positions to the identification of the clause structure, and the adverbs in her framework are syntactically restricted to functional projections, as in the F-Specifier model. However, the syntactic ordering is fixed by UG only for a reduced set of

functional projections, and therefore semantic considerations determine at least some of the relative ordering data, in accordance with the Unbounded Adjunction model.

5.2.2.4   The F-Specifier Model (Cinque 1999) and Wijler sentences

The Wijler sentences present a challenge for the F-Specifier model because it predicts that each adverb has one designated position, and the adverbs in the paradigm show ordering alternations. Cinque proposes that all sentential adverbs can occur in something similar to Wijler sentences, provided that that the argument is a focus.

He observes that sentential adverbs are grammatical in the 'wrong' positions only when they are immediately followed by a focus argument.

(47) a   *Gianni lo merita
francamente/fortunatamente/evidentemente/probabilmente…
Gianni it deserves frankly/fortunately/evidently/probably/

b   Gianni lo merita
francamente/fortunatamente/evidentemente/probabilmente…
[per più di una ragione]_{Focus}
(Gianni it deserves frankly/fortunately/evidently/probably/… for more than one reason)

In (47a) the sentential adverbs follow the verb and the sentence is ungrammatical, but in (47b) they are in the same position, only followed by a focus argument, and the sentence is grammatical. Cinque argues that sentential adverbs can head a syntactic Focus phrase, of which the focus DP/PP is the syntactic complement. He proposes that adverbs are licensed as heads of a syntactic focus argument when they are semantically associated with the focus.

(48) a   Max only ate an apple [for breakfast]_F
(he did not eat an apple for other meals)

b   Max only ate [an apple]_F for breakfast
(he did not eat other things for breakfast)

Crucially, Cinque relies on the explanation of association with focus, because his theory predicts no syntactic/semantic flexibility of adverbs. However, as I showed in chapter 4, the DP/PP immediately following the adverb in Wijler sentences need not be the focus, so this leaves him with an unmotivated constituent, of which an adverb may serve as a

head (not a trivial decision), and in which some adverbs can show, regardless of their specific lexical properties. It thus seems that Ernst's adjunction model fares better in this respect, because he predicts flexibility (provided that the semantic restrictions are met).

5.3   Conclusion

In this chapter I reviewed some of the literature concerning the issue of compositionality in the grammar of adverbs. I presented the compositionality hypothesis, and showed that Wijler sentences provide evidence supporting it. I then presented two distinct models, assuming the compositionality hypothesis: Cinque's 1999 model, in which the syntax and semantics of adverbs are determined by UG, and Ernst's 2002 model of adjunction, in which adverbs are syntactically unbounded, but the denotation of their syntactic argument must be a possible semantic argument. Both theories argued that adverbs and arguments in constructions similar to the Wijler sentences form a constituent. In Ernst's model this does not present a problem since adjunction is unbounded, and is predicted to be possible with any category, provided that the semantic requirements are met. However, one would have to specify what is it about the semantics of the adverbs under consideration allowing them to take the semantic denotation of a DP or a PP as a semantic argument. In Cinque's model, such configurations do present a problem, since he assumes that each adverb has one designated position on the tree. Cinque proposes to solve this problem assuming that these adverbs are licensed as heads in a focus phrase, which in itself is licensed by the fact that these adverbs can associate with the focus. However, as I showed in chapter 4, we could not assume that the argument in Wijler sentences is obligatorily the focus. In the following chapter, I will take the adjunction and the focus phrase hypotheses as a starting point for my theory of the syntax and semantics of Wijler sentences.

Capter 6:   The Syntax and Semantics of Wijler Sentences

6.1   The Syntax

We expect a syntactic theory of Wijler sentences to have the adverbs and the immediately following DP or PP form a syntactic constituent.

Consider:

(1)   maks rak hicig   et sara le-ruti beyom riSon
        Max only introduced acc Sara to Ruti on Sunday

Placing *rak* 'only' immediately preceding a DP or a PP, affects the choice of its associate in a predictable way. For example:

(a) maks hicig   et   sara le-ruti   rak   beyom riSon
    Max   introduced acc Sara to Ruti only on Sunday

    Associate: <u>on Sunday</u> : he did not introduce Sara to Ruti on any other day

(b) maks hicig   et   sara rak   le-ruti   beyom riSon
    Max   introduced acc Sara only to Ruti on Sunday

    Associate: <u>to Ruti</u> : he did not introduce Sara on Sunday to any other
                                                  person

(c) maks hicig   rak et   sara le-ruti   beyom riSon
    Max   introduced only acc Sara to Ruti on Sunday

    Associate: <u>Sara</u>: he did not introduce to Ruti on Sunday anybody else

(d) rak   maks hicig   et   sara   le-ruti   beyom riSon
    only Max   introduced acc Sara to Ruti on Sunday

    Associate: <u>Max</u>: nobody other than Max introduced Sara to Ruti on
                                              Sunday

(2)   [tamid et haxulca hazot]$_k$ at omeret li lilboS t$_k$ (from actual discourse)
      always this shirt you tell me to wear
      (repeated from chapter 5 above)

If we assume that the adverb forms a syntactic constituent with the immediately following DP or PP, then we can easily predict the paradigm in (1), and we account for the fronting possibility illustrated in (2).

As shown in chapter 5 above, Ernst 2002 argues that adverbs can be adjoined to the following DP or PP, and Cinque 1999 proposes that sentential adverbs can head a focus phrase. The two analyses are represented below, for the DP *acc Sara*, and for the PP *on Sunday*:
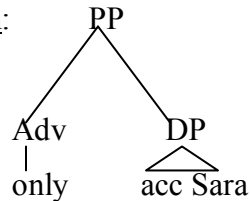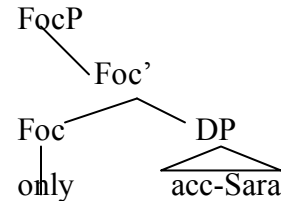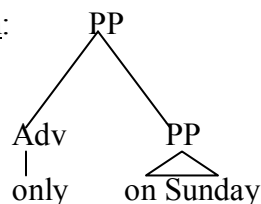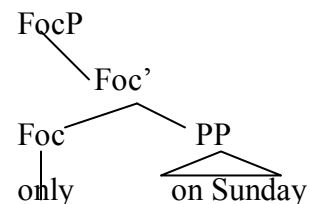
Either of these syntactic analyses could be used to account for the 'association' facts and the fronting. In fact in Ernst's model of the semantics of adverbs he argues that adverbs always semantically comment on their syntactic argument[27]. The relative 'freedom' in ordering illustrated in (1) follows directly on Ernst's assumptions; adverbs may be adjoined to any projection, provided that they can take that projection as their semantic argument. This 'free' ordering is problematic for Cinque, because his model does not allow syntactic flexibility. Cinque proposed that these configurations are licensed by semantic association with focus, but as I showed in chapter 4, this assumption cannot be maintained, so this leaves us with Ernst's adjunction hypothesis.

However, there is also empirical evidence against Ernst's adjunction hypothesis. Modifying a noun with 'only' in Hebrew requires the use of the **adjective:** *ayaxid/hayexida/hayexidim/hayexidot* 'the-only-number-gender', and it cannot be done with the adverb *rak* 'only'.

Adverbs in Wijler sentences including *rak* 'only' cannot immediately precede any DP or PP which are syntactic arguments of **a noun** or of **a preposition** (this is also shown to be the case for the German translation of *only*, *also* and *even* in (Büring and Hartmann 2001)). I underline the

'associate'.

(3) a   dan diber rak im <u>sara</u> bamesiba
Dan talked only with Sara at-the-Party

     b   *dan diber im   rak <u>sara</u> bamesiba
Dan talked with only Sara at-the-Party

(4) a   maks ibed rak et hasefer <u>mi-hasifriya</u>
Max lost only acc the-book from-the-library

     b   *maks ibed et hasefer rak <u>mi-hasifriya</u>
Max lost acc the-book only from-the-library

(5) a   dan roked tamid im   ota yalda
Dan dances always with acc-the-same girl

[27] Though his system allows for some ambiguity in the Infl. domain where an adverb could take either a proposition or an event as its semantic argument.

      b   *dan roked im   tamid ota yalda
           Dan dances with always acc-the-same girl

(6)   a   dan katav et   hamaamar davka   biglal   sara
          Dan wrote Acc the-article contra-belief because (of) Sara

      b   *dan katav et hamaamar biglal   davka   sara
           Dan wrote Acc the-article because(of) contra-belief Sara

Assuming that the adverb can adjoin to a DP or a PP, there is no way to block its adjunction in (3b), (4b), (5b) and (6b). This implies the DP/PP adjunction hypothesis could not be maintained.

     The generalization in (3)-(6) is that *rak* 'only' can immediately precede **arguments of the verb**, or **adjuncts of VP**, but not arguments of a noun or of a preposition. Based on similar data in Geraman, Büring and Hartman (2001) argue that the German adverb *nur* 'only' must adjoin to a *V-extended projection* (VP, IP non-argument CP and whatever comes in between the VP and IP) and that the linear position of the adverb is determined by a PF requirement for maximal closeness to the *nuclear accent* within the extended VP projection.

     One problem with Büring and Hartmann's hypothesis is that it would fail to account for the fact that the adverb and the DP or PP immediately following can be preposed as one syntactic constituent. Even if we could solve this problem[28], applying this hypothesis to Wijler sentences would predict that *rak* 'only' should immediately precede a DP/PP only if it contains the nuclear accent of the sentence, but this prediction is not borne out. Consider for example (repeated from chapter 4; nuclear accent is bodfaced):

(7)   A: lama at meduket
          why (are) you depressed?

     B: niSaru rak yomaim ad sof **haxofeS hagadol**
        Left   only two-days till end the big vacation
        (only two days are left till the end of the summer vacation)

The DP immediately following *rak* 'only' (with which it associates) is *yomaim* 'two days'. Crucially, this DP does not contain the nuclear accent of the sentence, which is assigned to *the big vacation*. Moreover, Büring and Hartmann's hypothesis could not be used to

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[28] In fact Büring and Hartmann propose an explanation for similar constituency tests in their data of German.

explain the restrictions on the semantic interpretation of adverbs in Wijler sentences (e.g., the existential entailment with negation and *almost*).

I conclude that both Büring and Hartmann's theory and Ernst's theory of adjunction to a DP or PP cannot be used to account for the syntax of Wijler sentences. What we need is a way to have the adverb and the following DP or PP in one syntactic constituent, which would be restricted to DPs and PPs which are either **arguments of a verb**, or are **adjuncts of VP**.

I propose that arguments of the verb and adjuncts of VP are headed by a V-functional head. The adverbs in Wijler sentences are adjoined to the functional phrase of which the lexical argument is the DP/PP immediately following them. For lack of a better name, I will call the proposed functional head V-Fnc and the corresponding projection V-FncP. Thus, I propose that:

[A]. Every argument of a verb and optional adjunct of the verb phrase is introduced into the syntax via a V-FncP.

For example, the syntax of: *Max kissed Sara* is as follows:
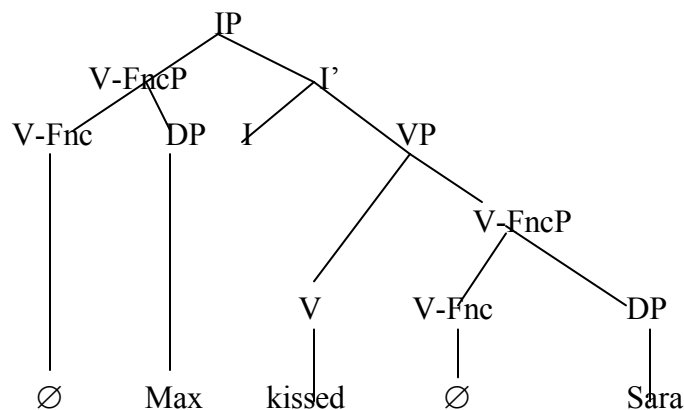
An immediate consequence of the V-FncP analysis is that it distinguishes between PPs and DPs which are arguments of a noun or of a preposition and DPs and PPs which are

arguments of the verb or adjuncts of VP. This will allow for an account of the restrictions on the adjunction of adverbs; they can adjoin to V-FncPs but not to DPs or PPs[29].

In addition, I propose the following:

[B]. Arguments of the verb enter the derivation annotated for their relative hierarchical position, reflecting the order in which they are inserted into the derivation (assuming a bottom up derivation).

♦ That is, given a transitive verb, the V-Fnc heading the V-FncP of which the lexical argument is the direct object of the verb is annotated with the subscript 1 (V-Fnc$_1$) and the corresponding V-FncP is V-Fnc$_1$P, while the V-Fnc head of the V-FncP which is the sister of I' (the one in which the subject DP is the lexical argument) is annotated with 2, the corresponding V-FncP being V-Fnc$_2$P. This annotation is a reflection of the syntactic hierarchy, and I will use it for the semantic derivation.

[C]. Adjoined V-FncPs (that is, ones in which the lexical arguments are optional modifiers of the verb phrase) are not annotated for order.

♦ This reflects the fact that modifiers of a given projection can be adjoined in any order, as illustrated in example (9) (from Landman 2000).

(9) a John buttered the toast slowly in the bathroom with a knife
      b John buttered the toast with a knife in the bathroom slowly
      c John buttered the toast with a knife slowly in the bathroom
      …

My syntactic analysis is illustrated below for the sentence *John cut the bread with a knife.*

---

[29] In fact, I personally believe that there would be analogous N-FncPs to which they can't be adjoined, but this lies outside the scope of this paper.

```
                              IP
                             /  \
                            /    \
                           /      I'
                          /      /  \
                         /     I⁰    VP
                        /      /    /  \
                       /      /   VP    \
                      /      /   /  \    \
                     /      /   /    \    \
              V-Fnc₂P      /  V-Fnc₁P  V-FncP
               /  \       /   /  \      /  \
          V-Fnc₂ DP     V  V-Fnc₁ DP  V-Fnc PP
             |    |      |    |    /\    |   /\
             ∅  John   cut   ∅   /  \    ∅  /  \
                                the bread   with a knife
```
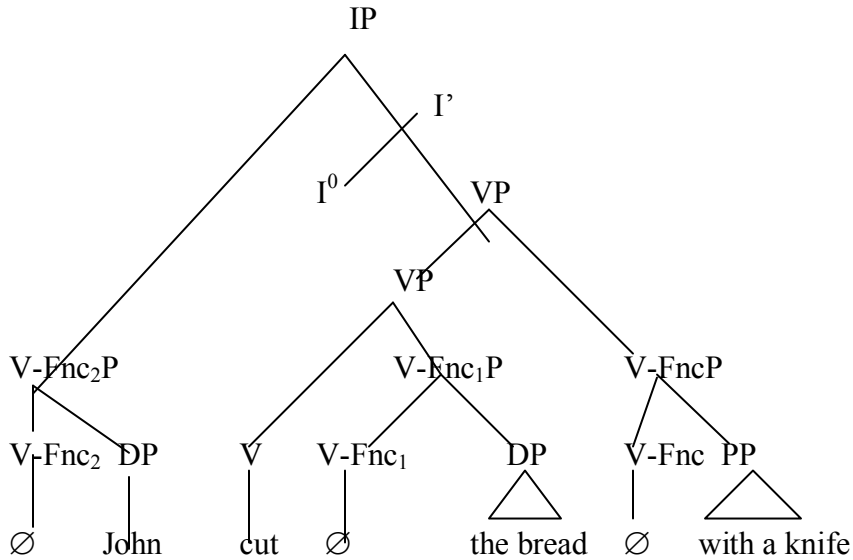
This concludes my proposal of the syntax of Wijler sentence. The main motivation for this syntax comes from the semantic interpretation of these sentences, as will become clear shortly.

6.2.   The Semantics of Wijler Sentences

6.2.1   The Semantic Argument of the Adverb is Not the DP or PP Following it

I have established based on syntactic empirical evidence that in Wijler sentences, an adverb preceding a DP or a PP is not syntactically adjoined to that DP or PP. I think this is not an arbitrary fact; rather, there is something semantically wrong with it modifying the DP or PP. Let me illustrate this with the case of *kim'at*   'almost'.

One fact concerning Wijler sentences with *kim'at* 'almost' that our semantics must explain is the existential entailment:
e.g.,

(10)   sara niSka kim'at eser banot
        Sara kissed almost ten girls

…#aval basof hi lo niSka af axat
… but in the end she did not kiss any girl

The first clause in (10) entails that Sara did kiss some girl(s) and the conjunct negating this claim is therefore contradictory. Crucially, there is no problem in adding such a conjunct to the corresponding sentence with the adverb in Infl.:

(10')   sara kim'at niSka eser banot
         Sara almost kissed ten girls

         …aval basof   hi lo   niSka   af axat
         …but in-the-end she not kissed any one(fem.)

The same distinction shows up when the following expression is a PP:

(11)   sara higi'a laavoda kim'at bazman
         Sara arrived to-work almost on-the-time

         …#aval basof   hi lo higi'a laavoda bixlal
         … but in-the-end she not arrived to-work at-all

The first clause in (11) entails that there is a time at which Sara arrived at work, and the denial conjunct is contradictory.

(11')   sara kim'at higi'a laavoda bazman
         Sara almost arrived to work on-the-time

         …aval basof hi lo higi'a laavoda bixlal
         …but in the end she not arrived at all

(11') with the adverb in Infl, does not entail that Sara arrived at work, and therefore, there is no contradiction. Assume the following lexical information about *kim'at* 'almost'.

Lexical information about *kim'at* ('almost'):

Syntax: When in Infl. position, its syntactic argument is the IP.

Semantics (Sevi 1995)*: almost* applies to a single argument, of type t
Let φ be a formula and let I be a discrete set and let < be a three place relation s.t. for every $i^* \in I$, $<_{i^*}$ is a strict partial order on I ($i_1 <_{i^*} i_2$ is read as i_1 is closer to i^* than i_2). $�median almost \varphi ⟧^{i^*} = 1$ iff $⟦\varphi⟧^{i^*} = 0$ and there is $i' \in I$, s.t., for any $i'' \in I$, $i' <_{i^*} i''$ and $⟦\varphi⟧^{i''} = 1$

We may also allow *kim'at* to apply to arguments of other semantic types, as follows.

Let Y be a variable of type $\langle ty,t\rangle$, for an arbitrary type ty. For any type ty and any corresponding type Y,

$almost(Y) = \lambda x[almost\ [Y(x)]]$,   where x is a variable of type ty.

Or, somewhat informally:

$kim'at(Y) =$ $\lambda x[\neg Y(x) \wedge$ relative to a minimally more lenient standard of precision, or a minimally different possible world, (etc.,) $Y(x)]$

Where x is a variable of type ty

<u>constraint:</u> The semantic argument is always the syntactic argument.

Note that the semantic rule does not say that the standard is minimally more lenient; a standard $s' \in S$ (closer to s^* than any arbitrary s") could be either minimally stricter or minimally more lenient, but assuming $9\varphi0^{s^*}=0$, φ cannot be true relative to any s' stricter than s^*. Only a minimally more lenient standard s' can be such that $9\varphi0^{s^*}=0$ and $9\varphi0^{s'}=1$.

Let us see what happens if we try to account for the existential entailment of (10) assuming that *kim'at* 'almost' does modify the DP *10 girls*.

ten girls $\rightarrow \lambda P[\exists y \in\ ^*GIRL\ (|y|=10 \wedge P(y))]$ type $\langle\langle d,t\rangle,t\rangle$

♦ d is type of individuals

♦ *GIRL denotes the set of sums of girls or the property of being a sum of girls

According to my assumptions about the semantics of *almost*:

almost ten girls $\rightarrow$ *almost* ($\lambda P[\exists z \in\ ^*GIRL\ (|z|=10 \wedge P(z))]$)

$= \lambda Q[almost\ [\exists z \in\ ^*GIRL(|z|=10 \wedge Q(z))]]$

In order to get the generalized quantifier of type $\langle\langle d,t\rangle,t\rangle$ as an argument of the verb,

kiss of type $\langle d,\langle d,t\rangle\rangle$, would have to be lifted to type $\langle\langle\langle d,t\rangle,t\rangle\ \langle\langle\langle d,t\rangle,t\rangle,t\rangle\rangle$:

$KISS = \lambda P[\lambda x[P(\lambda y[kiss(x,y)])]]$ where P is a variable of type $\langle\langle d,t\rangle,t\rangle$

kiss almost ten girls $\rightarrow$

$\lambda P[\lambda x[P(\lambda y[kiss(x,y)])]]$ $(\lambda Q[almost\ [\exists z \in\ ^*GIRL(|z|=10 \wedge Q(z))]])$

$= \lambda x[\lambda Q[almost\ [\exists z \in\ ^*GIRL\ (|z|=10 \wedge Q(z))]]\ (\lambda y[kiss(x,y)])]$

$= \lambda x[almost\ [\exists z \in\ ^*GIRL\ (|z|=10 \wedge \lambda y[kiss(x,y)]\ (z))]]$

$= \lambda x[almost\ [\exists z \in\ ^*GIRL\ (|z|=10 \wedge kiss(x,z))]]$

Applying this to *Sara* we get:

$\lambda x[almost [\exists z\in {}^{*}GIRL (|z|=10 \wedge(kiss(x,z)))]](s)$

$= almost [\exists z\in {}^{*}GIRL (|z|=10 \wedge(kiss(s,z)))]$

i.e., somewhat informally:

$= \neg\exists z\in {}^{*}GIRL (|z|=10 \wedge (kiss(s,z))) \wedge$ relative to a minimally more lenient standard of precision, or a minimally different possible world, (etc.,) $\exists z\in {}^{*}GIRL (|z|=10 \wedge (kiss(s,z)))$

i.e., It is not the case that Sara kissed a sum of ten girls, but relative to a minimally more lenient standard of precision, or a minimally different possible world Sara did kiss a sum of ten girls.

This captures some aspects of the meaning of (10), but it fails to capture the existential entailment, since it is compatible with the claim that Sara did not kiss any girl.

Well, Suppose, then, that we have the adverb take IP as its syntactic argument as in Büring and Hartmann 2001, in which case it would modify the proposition denoted by the IP to which the adverb adjoins. In that case, the semantics of (10) would end up the same as in our previous attempt, viz. the following,

$\neg\exists z\in {}^{*}GIRL(|z|=10 \wedge (kiss(s,z))) \wedge$ relative to a minimally more lenient standard of precision or a minimally different possible world (etc.,) $\exists z\in {}^{*}GIRL(|z|=10 \wedge (kiss(s,z)))$

again failing to predict the existential entailment.

6.2.2   The Real Semantic Argument of the Adverb: Preliminaries

What **does** the adverb modify? Consider the following examples:

(12) a   maks lo niSek et   lusi
         Max not kissed Acc Lucy

     b   *maks niSek lo et   lusi
          Max kissed not Acc Lucy

     c   maks niSek lo et   lusi ela   et braxa
         Max kissed not Acc Lucy but-rather acc Bracha

(12b) is confidently judged as bad. There isn't anything syntactically wrong with it, as becomes clear when we compare it with (12c). What is wrong with it then? My intuition is that what is wrong with (12b) is that it asserts that there was an event of kissing of

which the agent was Max, but **provides no argument for the theme role**. It is not merely that 'not Lucy' does not provide enough information about who the individual filling the theme role might actually be, as can be seen when we contrast (12b) with (13).

(13) maks niSek miSehi Seena   lusi
      Max kissed someone who-is-not Lucy

(13) is not any more informative than (12b) concerning the identity of the individual filling the theme role, and yet it is perfectly acceptable. The contrast between (12b) and (13) can be explained if we assume that (13) succeeds in filling the theme role, albeit not very informatively, whereas (12b) does not succeed in providing this role at all. It seems to me that the role of *lo* in the unacceptable (12b) is to tell us that it is not the case that the individual filling in the theme role in the event of Max's kissing is Lucy. I therefore suggest that what the negation in (12b) and (12c) modifies is the **choice of Lucy for the role of the theme argument**.

The V-Fnc Phrases introduced in section 6.1 above can be put to use in order to express this idea. We may assume that semantically, the adverb in a Wijler sentence modifies the interpretation of its syntactic argument the V-FncP. I propose that what V-FncP expresses semantically is precisely an association between the denotation of its lexical argument and a given thematic role.

In order to provide a formal analysis along these lines, I will need to use event semantics. I present below Landman's 2000 event semantics.

6.2.3   Event Semantics (Landman 2000)

i.   *The Language of events*:

Following is the language of events given in Landman 2000, section 2.2.1, with minor modifications. In addition, I will present elements of Landman's language of plurality: 'sum of' and 'part of'[30]. Landman assumes Montague type theory to which he adds more set theoretic elements.

TYPE: is the smallest set such that:

---

[30] These constitute a part of Landman's theory of plurality.

1. d, pow(d), e, pow(e), t∈TYPE

2. if a,b ∈TYPE, then <a,b> ∈TYPE

- d is the type of individuals
- pow(d) is the type of sets of individuals
- e is the type of events
- pow(e) is the type of sets of events
- t is the type of truth values
- <a,b> is the type of functions from type a to type b.

Constants:

1. CONd: j, b, …   individual constants
2. CONpow(d): BOY, GIRL…   nominal constants

Nominal constants correspond to nouns, and nouns will consequently be interpreted as sets of individuals.

3. SUMd   a sortal constant

4. CONpow(e): KISS, WALK…   verbal constants

Verbal constants correspond to verbs, which are consequently interpreted as sets of events.

pow(d) and pow(e) have another type of constant:

5. D ∈ pow(d), E∈ pow(e)

D will denote the whole domain of individuals, E the whole domain of events.

6. CON<e,d>: Ag, Th, etc.

these constants denote thematic roles, and they will be interpreted as functions from events into individuals.

Variables:

for every type a: VARa = $\{x_{1,a}, x_{2,a}, …\}$

Expressions:

for every type a: EXPa = the set of expressions of type a
α∈EXPa will also be written, for short, as: α∈a

Constants and Variables:

1. for every type a: CONa∪VARa ⊆ EXPa

Functional abstraction:

2. for any types a,b: if $x \in$ VARa and $\beta \in$ b, then $\lambda x[\,\beta\,] \in$ <a,b>[31]

Functional application:

3. for any types a,b: if $\alpha \in$ <a,b> and $\beta \in$ a, then $(\alpha\,(\beta)) \in$ b

Connectives, identity:

4. a. if $\varphi,\psi \in$ t, then $\neg\varphi$, $(\varphi\wedge\psi)$, $(\varphi\vee\psi) \in$ t
    b. if $\alpha_1,\alpha_2 \in$ d, then $(\alpha_1{=}\alpha_2) \in$ t
       if $\alpha_1,\alpha_2 \in$ e, then $(\alpha_1{=}\alpha_2) \in$ t

Set formation:

5. if $x \in$ VARd and $P \in$ pow(d) and $\varphi \in$ t then: $\{x \in P : \varphi\} \in$ pow(d)
   if $x \in$ VARd and $P \in$ pow(d) and $\varphi \in$ t then: $\{x \in P : \varphi\} \in$ pow(d)

Set application:

6. if $\alpha \in$ d and $P \in$ pow(d), then $(\alpha \in P) \in$ t
   if $\alpha \in$ e and $P \in$ pow(e), then $(\alpha \in P) \in$ t

Restricted Quantification:

7. if x is a variable of any type and $\varphi,\psi \in$ t, then[32]:

   $\forall x\,(\varphi)\,(\psi) \in$ t, and

   $\exists x\,(\varphi)\,(\psi) \in$ t

♦ I use the shorthand illustrated by the following:
   $\forall d(d \in BOY)(\psi)$ will be written as $\forall d \in BOY(\psi)$
   $\exists e(e \in WALK)(\psi)$ will be written as $\exists e \in WALK(\psi)$
   etc.
♦ Another shortand I use is omitting the restriction when it is trivial.
   e.g., $\forall d(d \in D)(\varphi)$ will be written as $\forall d(\varphi)$.

Definites:

8. if $P \in$ pow(d) then $\sigma(P) \in$ d   e.g., $\sigma(BOY)$ translates *the boy*.

Plurality (Part-of and sum)[33]:

9. if $\alpha,\beta \in$ d then $(\alpha$ **part-of** $\beta) \in$ t

   if $\alpha,\beta \in$ e then $(\alpha$ **part-of** $\beta) \in$ t

10. if $\alpha,\beta \in$ d then $(\alpha$ **u** $\beta) \in$ d

---

[31] Landman 2000 uses a dot to mark the scope of the function $(\lambda x.\beta)$, but I use square brackets $(\lambda x[\beta])$.
[32] I diverge from Landman 2000 in giving a more general schema for restricted quantification: I assume quantification over any type, where the restriction and scope may vary as long as they are of type t.
[33] A bit clumsily, I use **u** for sum, and **part-of** for the part-of relation.

if $\alpha,\beta \in e$ then $(\alpha \sqcup \beta) \in e$

11.   if $P \in pow(d)$ then $\sqcup(P) \in d$

if $P \in pow(e)$ then $\sqcup(P) \in e$

ii.   *Models for the language of events*

A model for the language of events (with the added elements of plurality) is a tuple:

M=<D,E,N, $\perp$,i>

where:

    1. D is a non-empty domain of individuals,

    2. E is a non-empty domain of events,

    3. $D \cap E = \varnothing$

    4. N is <N, <>,the set of natural numbers with the standard order

    5. $\perp$ the undefined object is an object not in $D \cup E \cup N$

    6. i is an **interpretation function**:

The interpretation function i assigns to each constant of type a some member of Da,

for any type a.

    where the logical constants D and E are interpreted thus: i(D)=D and i(E)=E;

    and Da is defined as follows.

Semantic domains based on model M:

For every type a: Da = the **semantic domain** for type a

              (i.e., the set of possible denotations for expressions of type a)

    Semantic domains:

Dd = $D \cup \{\perp\}$ (the semantic domain of individuals)

De = $E \cup \{\perp\}$ (the semantic domain of events)

Dn = N   (the semantic domain of natural numbers)

Dt = $\{0,1\}$ (the semantic domain of propositions)

Dpow(d) = pow(D)   (the semantic domain of sets of individuals)

Dpow(e) = pow(E)   (the semantic domain of sets of events)

D<a,b> = (Da → Db), the set of functions from Da to Db

Assignment functions:

An assignment function *g* assigns to each variable of type a some member of Da, for any type a.

g[x→d] := the assignment at most differing from g in that g[x→d](x)=d

iii   *Semantics for the language of events*:

We recursively define $⟦α⟧^{M,g}$, the semantic value of α in M relative to g, for any expression α:

Constants and Variables:

1.   For any constant c, $⟦c⟧^{M,g} = i(c)$

For any variable x, $⟦x⟧^{M,g} = g(x)$

Functional abstraction and application:

For any type a:

2. $⟦λx_a[β]⟧^{M,g} = λd∈Da [⟦β⟧^{M,g[xa→d]}]$

This is the function that maps every object in Da onto the semantic value of β relative to M and g[x_a→d]

3. $⟦(α(β))⟧^{M,g} = ⟦α⟧^{M,g}(⟦β⟧^{M,g})$

Connectives, identity:

4.   a. $⟦¬φ⟧^{M,g}=1$ iff $⟦φ⟧^{M,g}=0$; 0 otherwise

$⟦φ∧ψ⟧^{M,g}=1$ iff $⟦φ⟧^{M,g}=1$ and $⟦ψ⟧^{M,g}=1$; 0 otherwise
$⟦φ∨ψ⟧^{M,g}=1$ iff $⟦φ⟧^{M,g}=1$ or $⟦ψ⟧^{M,g}=1$; 0 otherwise

b. $⟦α_1=α_2⟧^{M,g}=1$ iff $⟦α_1⟧^{M,g} = ⟦α_2⟧^{M,g}$ and $⟦α_1⟧^{M,g}, ⟦α_2⟧^{M,g} ≠ ⊥$; 0 otherwise

Set formation and set application:

5. $⟦\{x∈ P:φ\}⟧^{M,g} = \{d∈ ⟦P⟧^{M,g}: ⟦φ⟧^{M,g[x→d]}=1\}$;

6. $⟦t∈ P⟧^{M,g}=1$ iff $⟦t⟧^{M,g} ∈ ⟦P⟧^{M,g}$; 0 otherwise

Quantification:

7. $⟦∀x(φ)(ψ)⟧^{M,g}=1$ iff

for every $d \in D$ s.t. $⟦\varphi⟧^{M,g[x \to d]}=1$, $⟦\psi⟧^{M,g[x \to d]}=1$; 0 otherwise

$⟦\exists x(\varphi)(\psi)⟧^{M,g}=1$ iff

for some $d \in D$ s.t. $⟦\varphi⟧^{M,g[x \to d]}=1$, $⟦\psi⟧^{M,g[x \to d]}=1$; 0 otherwise

Definites:

8. $⟦\sigma(P)⟧^{M,g}= d$ iff $⟦P⟧^{M,g}= \{d\}$; undefined otherwise

Plurality (Part-of and sum):

First some definitions:

An i-join semilattice is a structure:

$D = \langle D, u \rangle$ where:

i. D is a non-empty set

ii. u is a function that assigns to every non-empty subset X of D:

uX, the sum of X

iii. We define the relation **part-of** by:

a **part-of** b iff $u\{a,b\} = b$

♦ We require **part-of** to be a partial order on D (reflexive transitive and antisymmetric)

9. $⟦\alpha \text{ part-of } \beta⟧^{M,g}= 1$ iff $⟦\alpha⟧^{M,g}$ **part-of** $⟦\beta⟧^{M,g}$; 0 otherwise

10. $⟦\alpha \text{ u } \beta⟧^{M,g}= ⟦\alpha⟧^{M,g} \text{ u } ⟦\beta⟧^{M,g}$ if $⟦\alpha⟧^{M,g} \neq \bot$, $⟦\beta⟧^{M,g} \neq \bot$; $\bot$ otherwise

11. $⟦u(P)⟧^{M,g} = u(⟦P⟧^{M,g})$ if $⟦P⟧^{M,g} \neq \emptyset$; $\bot$ otherwise

iv *The Grammar*

Some terminology:

$\langle d^n, a \rangle := \langle d, \langle d, \ldots, \langle d, a \rangle \ldots \rangle$ where $a \in$ TYPE and $n \geq 0$
              n times
An **n place property** is a function in $\langle d^n, t \rangle$

An **n-place event type** is a function in $\langle d^n, pow(e) \rangle$

• An n place property maps n individuals onto a truth

value

- An n place event type maps n individuals onto a set of events

VERBS:

An n-place verb denotes an n-place event type, viz., a function that maps n individuals onto a set of events in which the individuals are assigned some lexically designated thematic roles.

e.g.,

Intransitive verbs: We associate with *walk* a constant WALK of type pow(e). We translate *walk* as a one-place event type:

$walk \rightarrow \lambda x$ [{e∈WALK: Ag(e)=x}] $\qquad$ <d,pow(e)>

i.e., *walk* is a function that maps an individual onto the set of walking events with that individual as agent.

transitive verbs with two arguments: We associate with *kiss* a constant KISS of type pow(e). We translate *kiss* as a two-place event type:

$kiss \rightarrow \lambda y \lambda x$ [{e∈KISS: Ag(e)=x ∧ Th(e)=y}] $\qquad$ <d,<d,pow(e)>>

i.e., *kiss* is a function that maps an individual in object position and an individual in subject position onto the set of kissing events with the individual in object position as theme and the individual in subject position as agent.

NOUN PHRASES:

Assumption: there are two kinds of NPs:

(i) **Non-quantificational NPs**: proper names, definites and indefinites: *John*, *the woman*, *a girl*, *10 girls*

(ii) **Quantificational NPs**: *every boy*, *no girl*, etc.

Interpretation of noun phrases:

$John \rightarrow j$ $\qquad\qquad\qquad\qquad$ j∈CONd

$a\ boy \rightarrow \lambda P[\exists x \in BOY(P(x))]$ P∈VAR<d,t> $\qquad$ *a boy* of type <<d,t>,t>

$the\ boy \rightarrow \sigma(BOY)$ $\qquad\qquad\qquad$ of type d

$every\ boy \rightarrow \lambda P[\forall x \in BOY(P(x))]$ $\qquad$ of type <<d,t>,t>

$no\ boy \rightarrow \lambda P[\neg \exists x \in BOY(P(x))]$ $\qquad$ of type <<d,t>,t>

$ten\ girls \rightarrow \lambda P[\exists x \in {}^{*}GIRL: |x|=3 \wedge P(x)]$ $\qquad$ of type <<d,t>,t>

<u>COMBINING A VERB WITH ITS ARGUMENTS</u>:

Landman elaborates on the distinct ways in which quantificational and non-quantificational NPs are associated with the verb.

Event type principle: Non-quantificational NPs can be entered into event types. Quantificational NPs cannot be entered into event types

This implies that non-quantificational elements may be associated with the verb through in situ functional application or through quantifying in, but quantificational NPs are necessarily associated with the verb through quantifying-in[34].

Type lifting rules:

NPs:

$\quad$ LIFT: $d \rightarrow <<d,t>,t>$

$\quad$ LIFT $[\alpha] = \lambda P [P(\alpha)]$

Let $T=<<d,t>,t>$, the type of generalized quantifiers.

Intransitive verb phrases:

$\quad$ LIFT: $<d,pow(e)> \rightarrow <T,pow(e)>$

$\quad$ LIFT $[V] = \lambda T[\{e \in E: T(\lambda x[e \in V(x)])\}]$

Transitive verb phrases:

$\quad$ LIFT: $<d,<d,pow(e)> \rightarrow <T,<d,pow(e)>>$

$\quad$ LIFT $[V] = \lambda T [\lambda x[\{e \in E: T(\lambda y[e \in V(x,y)])\}]]$

Generalized functional application:

APPLY:

1. if $\alpha \in <a,b>$ and $\beta \in a$ then: $\quad$ APPLY$[\alpha,\beta] = (\alpha(\beta))$

2. if LIFT$[\alpha] \in <a,b>$ and $\beta \in a$ then: $\quad$ APPLY$[\alpha,\beta] = (LIFT[\alpha](\beta))$

3. if $\alpha \in <a,b>$ and LIFT$[\beta] \in a$ then: $\quad$ APPLY$[\alpha,\beta] = (\alpha(LIFT[\beta]))$

In situ application:

The verb applies to its arguments through APPLY:

---

[34] Quantifying in is not relevant for the present research, in which I will have only non-quantificational NPs, associating with the verb through in situ functional application.

V_t+NP$\rightarrow$VP   *Interpretation*: V_t' NP'   APPLY[V_t', NP']

NP+VP$\rightarrow$S   *Interpretation*:   NP'   VP'   APPLY[NP',VP']

Examples:

       John walks

  John $\rightarrow$ j
  Walk $\rightarrow \lambda$x[{e$\in$WALK: Ag(e)=x}]

In situ application:

  John walks $\rightarrow$ APPLY [λx[{e$\in$WALK: Ag(e)=x}],j]
        = λx[{e$\in$WALK: Ag(e)=x}](j)
        = {e$\in$WALK: Ag(e)=j}

      i.e., the set of walking events with John as agent

     a girl walks

  a girl $\rightarrow \lambda$P[$\exists$x$\in$GIRL(P(x))]
  Walk $\rightarrow \lambda$x [{e$\in$WALK: Ag(e)=x}]

In situ application:

  A girl walks $\rightarrow$ APPLY [λx [{e$\in$WALK: Ag(e)=x}], λP[$\exists$x$\in$GIRL(P(x))]]

      = LIFT[λx [{e$\in$WALK: Ag(e)=x}]] (λP[$\exists$x$\in$GIRL(P(x))])

      = LIFT [λv[{e$\in$WALK: Ag(e)=v}]] (λP[$\exists$z$\in$GIRL(P(z))])

= λT[{e$\in$E: T(λx[e$\in${e$\in$WALK: Ag(e)=x }])}] (λP[$\exists$z$\in$GIRL(P(z))])

={e$\in$E: λP[$\exists$z$\in$GIRL(P(z))] (λx[e$\in${e$\in$WALK: Ag(e)=x }])}

={e$\in$E: $\exists$z$\in$GIRL(λx[e$\in${e$\in$WALK: Ag(e)=x }] (z)) }

={e$\in$E: $\exists$z$\in$GIRL(e$\in${e$\in$WALK: Ag(e)=z }) }

={e$\in$E: $\exists$z$\in$GIRL(e$\in$WALK $\wedge$ Ag(e)=z) }

={e$\in$WALK: $\exists$z$\in$GIRL(Ag(e)=z) }

    i.e., the set of walking events whose agent is a girl

Example of transitive:

      A boy kisses a girl

    a girl $\rightarrow \lambda$P[$\exists$x$\in$GIRL(P(x))]
    kiss $\rightarrow \lambda$xλy [e$\in$WALK: Ag(e)=x $\wedge$ Th(e)=y]

We derive the VP *kissed a girl* in much the same way as we derived *a boy walks.* Since the verb is a function from type d expressions to sets of event, we would need first to lift it in order to apply to *a girl* of type T, arriving (after reductions) at:

kiss a girl $\rightarrow \lambda x[\{e \in KISS: Ag(e)=x \wedge \exists y \in GIRL(Th(e)=y)\}]$

We then need to lift the VP to accept a type T subject, and we finally arrive at:

$$\{e \in KISS: \exists x \in BOY(Ag(e)=x) \wedge \exists y \in GIRL(Th(e)=y)\}$$

i.e., the set of kissing events of which the agent is a boy and the theme is a girl

EXISTENTIAL CLOSURE:

Once we derive an object of type pow(e) (a set of events), there is **default existential closure** deriving a proposition. Thus, the sentences *A girl walks* and *A boy kisses a girl* treated above end up interpreted as follows:

A boy walks

We have derived: $\{e \in WALK: \exists z \in GIRL (Ag(e)=z)\}$

Applying Existential Closure, we get:

$$\exists e \in WALK (\exists z \in GIRL(Ag(e)=z))$$

i.e., there is a walking event whose agent is a girl

A boy kisses a girl

We had: $\{e \in KISS: \exists x \in BOY(Ag(e)=x) \wedge \exists y \in GIRL(Th(e)=y)\}$

Existential Closure:

$$\exists e \in KISS (\exists x \in BOY(Ag(e)=x) \wedge \exists y \in GIRL(Th(e)=y))$$

i.e., there is a kissing event whose agent is a boy and whose theme is a girl

MODIFIERS:

Transitive verb phrase modifiers:

Let $V \in VAR<d,<d,pow(e)>>$.

 quickly $\rightarrow \lambda V \lambda y \lambda x[\{e \in E: e \in V(x,y) \wedge Mann(e) = QUICK^{35})\}]$

Intransitive verb phrase modifiers:

Let $V \in VAR<d,pow(e)>$.

 quickly $\rightarrow \lambda V \lambda x[\{e \in E: e \in V(x) \wedge Mann(e) = QUICK)\}]$

---

[35] I diverge from Landman 2000: where he writes QUICK(MANNER(e))

Prepositions:

The instrumental reading of the preposition *with*:

Let V be a variable of type <d,pow(e)>, and let Ins be the instrumental role.

with → λyλVλx[{e∈E: e∈V(x) ∧ Ins(e)=y}]

P+NP→PP   INTERPRETATION: P'   NP'   APPLY[P', NP']

We need a type shifting rule for P in case the NP is not of type d:

LIFT: <d,<<d,pow(e)>,<d,pow(e)>>> → <T,<<d,pow(e)>,<d,pow(e)>>>

LIFT [α]= λTλVλx[{e∈E : T(λy[e∈α(x,V,y))]}]

With these rules we derive:

With a knife → λyλVλx[{e∈E : e∈V(x) ∧ Ins(e)=y}](λP[∃z∈KNIFE(P(z))])

= λVλx[{e∈E : e∈V(x) ∧ ∃y∈KNIFE (Ins(e)=y)}]

6.2.4   The Semantics of V-Fnc Phrases

In previous sections, I proposed based on syntactic and semantic evidence that adverbs in Wijler sentences take a V-FncP as their syntactic and semantic argument. I proposed that arguments of the verb and adjuncts of the VP are all introduced into the syntax via V-Fnc Phrases. For example, in (10: *Sara kissed almost ten girls*), *almost* modifies a V-FncP whose lexical argument is a thematic DP, and in (14) below, *only* modifies a V-FncP whose lexical argument is a modifier of VP.

(14)   ben xatax et halexem rak besakin
        Ben cut acc the-bread only in-knife (Ben cut the bread only with a knife)

I am now going to give the semantics for the V-FncP, starting with the denotation of the V-Fnc head. I propose that in general, the semantic role of the V-Fnc head is to make sure that arguments and modifiers of the verb enter the semantic derivation as a **property of events (type <e,t>)**.

Let us first look at the case of V-Fnc$_n$Ps which are arguments of the verb. I will assume that for all thematic arguments, the lexical argument of V-Fnc is introduced as a DP; when the lexical argument looks like a PP, the preposition marks Case and it is

semantically null (e.g., the preposition *to* with dative arguments, or the Hebrew Case marker *et* with accusative arguments).

Consider for instance example (15), whose syntactic structure is presented below.

(15) Ben kissed Lucy
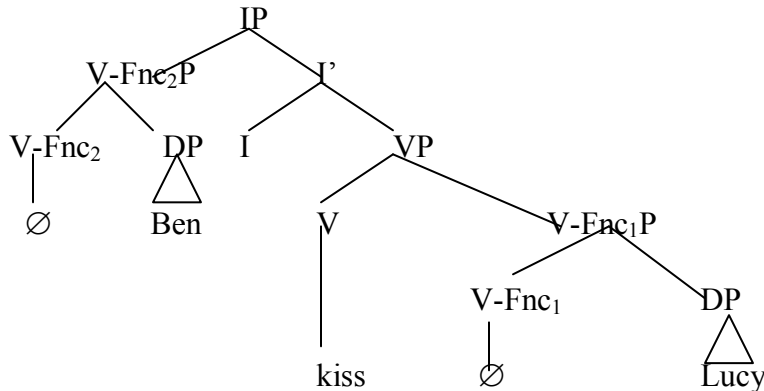
Recall that the subscripts on the V-Fnc$_n$Ps encode their relative position in the syntactic hierarchy, and hence, given compositionality, it also encodes the relative order in which these arguments are semantically processed.

I propose the following:

Let $\theta_1, \theta_2\ldots$ be variables of type <e,t>, representing thematic roles.

V-Fnc$_n$ $\rightarrow$ $\lambda d \lambda e\,[\,\theta_n(e)=d\,]$ type: <d,<e,t>>

'n' is a variable for a natural number s.t. n≥1 and, we see that the number in the translation of the V-Fnc is identical to the number on the V-Fnc head.

SYNTAX of V-Fnc$_n$P: V-Fnc$_n$+DP $\rightarrow$ V-Fnc$_n$P

INTERPRETATION of V-Fnc$_n$:   V-Fnc$_n$ 'DP'   APPLY[V-Fnc$_n$ 'DP']

Let us derive, for instance, the interpretation of V-Fnc$_1$P in the above tree.

V-Fnc$_1$ $\rightarrow$ $\lambda d \lambda e\,[\,\theta_1(e)=d\,]$ type <d,pow(e) >

V-Fnc$_1$P (applying V-Fnc$_1$ to the denotation of *Lucy*):

V-Fnc$_1$+lucy $\rightarrow$ $\lambda d \lambda e[\theta_1(e)=d](l) = \lambda e[\theta_1(e)=l]$

i.e., the property that an event has if thematic role θ_1 of that event is filled by Lucy

Note that θ_1 is a free variable of type $<e,d>$. As will become clear below, it will get bound when V-Fnc$_1$P is taken as an argument by the verb *kiss*, and will end up being "filled in" by the thematic role associated with the 1st argument of *kiss*, viz., by the Theme role. But that means that we may informally read

$\lambda e[\theta_1(e)=l]$

as:

the property that an event has if the thematic role associated with the first argument of the relevant verb is filled by Lucy

We see then that V-Fnc$_n$P does indeed express an association between the individual denoted by the lexical argument of V-Fnc$_n$ and a given thematic role. The role of the V-Fnc$_n$ head is to take that individual and return the property that an event has if the individual denoted by the lexical argument fills a given thematic role, where the actual thematic role is not specified, but it is to eventually get "filled in" in accordance with the event (as determined by the lexical entry for the verb).

6.2.5   A Revised Semantics for Verbs

It is usually assumed in event semantics that a (basic) verb takes individuals as its arguments. But on my theory, the arguments of a (basic) verb are syntactically V-Fnc$_n$Ps, and they are semantically properties of events. I must revise the semantics of verbs accordingly. Thus on my theory an intransitive verb will not be of type $<d,pow(e)>$ but rather of type $<<e,t>,pow(e)>$, a transitive verb (with two arguments) will not be of type $<d,<d,pow(e)>>$ but rather of type $<<e,t>,<<e,t>,pow(e)>>$, etc.

In addition, my semantics of verbs will have to ensure that the denotations of the lexical arguments of the V-Fnc$_n$Ps will end up filling the correct thematic roles. Recall that instead of taking as its arguments individuals d_1, d_2, etc., we want a verb to take as its arguments the property an event has if the thematic role θ_1 (whatever it may be) is filled by d_1, the property an event has if the thematic role θ_2 (whatever it may be) is filled by d_2, etc. And that in turn means that I will have to make sure that each of the free variables θ_n

present in the translations of the V-Fnc$_n$Ps will get 'filled in' by the thematic role which is supposed to be associated with the nth argument of the verb.

The interpretation of an intransitive verb V:

An intransitive verb is a function that maps a property of events onto a set of events.

Consider the following example:

(16) Ben sneezed

Let α be a variable of type $\langle e,t \rangle$

sneezed$\rightarrow \lambda\alpha[\{e \in SNEEZ: \lambda\theta_1[\alpha](Ag)(e)\}]$

i.e., A function which takes a property of events α and returns the set of sneezing events s.t., the thematic role in property α is "filled-in with" the thematic role AGENT and the result is a property of the sneezing event.

Let us derive the semantics of (16):

V-Fnc$_1$ $\rightarrow \lambda d\lambda e[\theta_1(e)=d]$ type $\langle d,pow(e) \rangle$

V-Fnc$_1$P (applying V-Fnc$_1$ to the denotation of *Ben*):

V-Fnc$_1$+ben $\rightarrow \lambda d\lambda e[\theta_1(e)=d](b) = \lambda e[\theta_1(e)=b]$

i.e., the property that an event has if thematic role θ_1 of that event is filled by Ben

ben sneezed$\rightarrow$

$\lambda\alpha[\{e \in SNEEZ: \lambda\theta_1[\alpha] (Ag)(e)\}](\lambda e[\theta_1(e)=b])$

$= \{e \in SNEEZ: \lambda\theta_1[\lambda e[\theta_1(e)=b] (Ag)(e)\}$

$= \{e \in SNEEZ: \lambda e[Ag (e)=b](e)\}$

$= \{e \in SNEEZ: Ag (e)=b\}$

i.e., the set of sneezing events of which the agent is Ben

E-closure:

$\exists e \in SNEEZ (Ag (e)=b)$

i.e., there was a sneezing event whose agent is Ben

The interpretation of a transitive verb V$_t$ (with one external and one internal argument):

A 2-place verb is a function that maps two properties of events onto a set of events.

e.g.,

Let α,β be variables of type $\langle e,t \rangle$.

kiss→λαλβ[{e∈KISS: [λθ$_1$[α]](Th)(e) ∧ [λθ$_2$[β]](Ag) (e)}]

i.e., A function which takes properties of events α and β and returns the set of kissing events s.t., property α is "filled-in with" the thematic role THEME and the result is a property of the kissing event, and β is "filled-in with" the thematic role AGENT and the result is a property of the kissing event.

Let us now derive the interpretation of (14) repeated below.

Ben kissed Lucy:

VP (Applying kiss to V-Fnc$_1$-P) →

λαλβ[{e∈KISS: [λθ$_1$[α]](Th)(e) ∧ [λθ$_2$[β]](Ag) (e)}](λe[θ$_1$(e)=l]

=λβ[{e∈KISS: [λθ$_1$[λe[θ$_1$(e)=l]]](Th)(e) ∧ [λθ$_2$[β]](Ag) (e)}]

=λβ[{e∈KISS: [λe[Th(e)=l]](e) ∧ [λθ$_2$[β]](Ag) (e)}]

=λβ[{e∈KISS: Th(e)=l ∧ [λθ$_2$[β]](Ag) (e)}]

IP (Applying kiss Lucy to V-Fnc$_2$P) →

λβ[{e∈KISS: Th(e)=l ∧ [λθ$_2$[β]](Ag) (e)}](λe[θ$_2$(e)=b])

={e∈KISS: Th(e)=l ∧ [λθ$_2$[λe[θ$_2$(e)=b]]](Ag) (e)}

={e∈KISS: Th(e)=l ∧ [λe[Ag(e)=b]](e)}

={e∈KISS: Th(e)=l ∧ Ag(e)=b}

E-closure:

∃e∈KISS (Th(e)=l ∧ Ag (e)=b)

i.e., there is a kissing event whose agent is Ben and whose theme is Lucy

6.2.6   The semantics of VP modifiers

Let us turn now to V-FncPs of which the lexical argument is a VP-modifier. Consider for instance example (17), whose syntactic structure is presented below. (I circled the V-FncP which I am going to interpret).

(17)   ben xatax et   halexem   be-sakin
        Ben cut   acc the-bread in-knife   (Ben cut the bread with a knife)
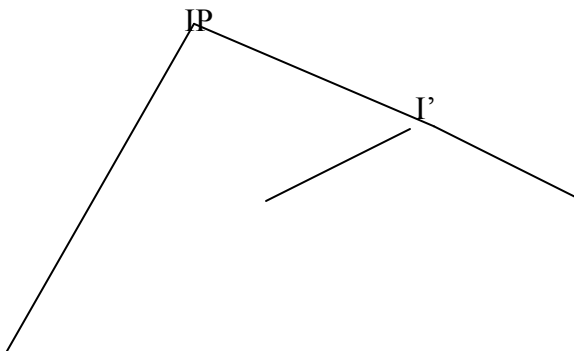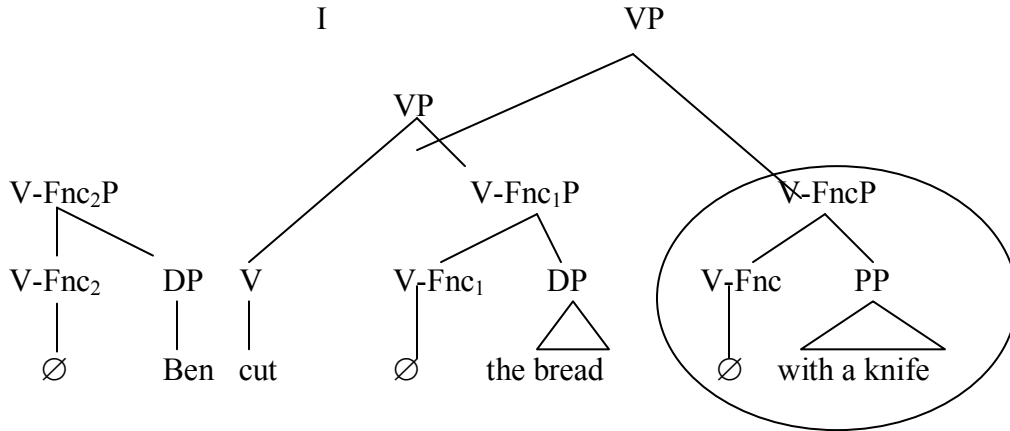
I assume that there are two kinds of modifiers which the V-Fnc head may take as its lexical argument:

    (a)   PPs:

with a knife $\rightarrow \lambda e[\exists z \in KNIFE\ (Ins(e)=z)]$

    (b)   VP-Adverbs:

rudely $\rightarrow \lambda e[Man(e)=rude]$

We saw that the function of the V-Fnc whose argument is a DP is to take that argument and turn it into a property of events. I will assume that the semantic function of the V-Fnc is in general just to ensure that the V-FncP denotes a property of events. In the case of a V-FncP whose argument is a modifier of the verb phrase, that argument is itself a property of events, so I will assume that if the argument of a V-Fnc is a modifier of the verb phrase, the V-Fnc denotes the identity function from properties of events to properties of events.

SYNTAX of V-FncP with a modifier: V-Fnc+MOD $\rightarrow$ V-FncP

INTERPRETATION of V-FncP: V-Fnc 'MOD'   APPLY[V-Fnc, 'MOD']

Hence, the denotation of the V-FncP is identical to that of the modifier.

The grammar of VP modification:

SYNTAX of VP modification: VP+V-FncP $\rightarrow$ VP

SEMANTICS of VP modification: VP' V-FncP'   APPLY[VP', V-FncP']

We have APPLY here and as always the question is what applies to what. The simplest thing as far as the types go is to apply the VP to the V-FncP. However, that will give us an entirely inappropriate result, because:

1. Individuals denoted by the lexical argument of the V-fnc will end up filling in the role which the verb is supposed to associate with the subject of the sentence; and
2. The top VP will receive an interpretation of type pow(e) and there will be no way of combining it semantically with the V-FncP containing the subject DP.

I propose that V-FncPs containing a modifier are not arguments of the VP, but on the contrary, the V-FncP takes the VP as its argument. I propose a type shifting rule which lifts the V-FncP from type <e,t> to type <<e,t>,pow(e)>, <<e,t>,pow(e)>> (that is: from VP to VP(transitive or intransitive)). This rule (i) ensures that the V-FncP can take the verb phrase as its argument; and (ii) adds a variable for yet another property of events, bound by a λ operator, so that the resulting VP will be able to take the V-FncP of which the lexical argument is the subject as its argument.

LET δ and γ be variables of type <e,t> and let *VP* be a variable of type <<e,t>, pow(e)>.
LIFT: <e,t> $\rightarrow$ <<e,t>,pow(e)>, <<e,t>,pow(e)>>
LIFT [δ] = $\lambda VP \lambda\gamma[\{e \in E: \delta(e) \wedge e \in VP(\gamma)\}]$

For example:
The V-FncP *with a knife* is lifted to this:
$\lambda VP \lambda\beta[\{e \in E: \exists z \in KNIFE (Ins(e)=z) \wedge e \in VP(\beta)\}]$ <<e,t>pow(e)>, <<e,t>,pow(e)>>
The V-Fnc *rudely* is lifted to this:
$\lambda VP \lambda\beta[\{e \in E: Man(e)=RUDE \wedge e \in VP(\beta)\}]$

Let us now derive (17) (*Ben cut the bread with a knife*):
cut the bread $\rightarrow \lambda\beta[\{e \in CUT: Th(e)=\sigma(BREAD) \wedge \lambda\theta_2[\beta](Ag) (e)\}]$
The V-FncP: *with the knife* takes the VP: *cut the bread* as its argument:
cut the bread with a knife $\rightarrow$

$\lambda VP \lambda \beta [\{e \in E: \exists z \in KNIFE (Ins(e)=z) \wedge e \in VP(\beta)\}]$
$(\lambda \beta [\{e \in CUT: Th(e)=\sigma(BREAD) \wedge \lambda \theta_2[\beta] (Ag) (e)\}])$

$= \lambda \beta [\{e \in E: \exists z \in KNIFE (Ins(e)=z) \wedge e \in \lambda \beta [\{e \in CUT: Th(e)=\sigma(BREAD) \wedge$
$\lambda \theta_2[\beta](Ag) (e)\}] (\beta)\}]$

$= \lambda \beta [\{e \in E: \exists z \in KNIFE (Ins(e)=z) \wedge e \in \{e \in CUT: Th(e)=\sigma(BREAD) \wedge$
$\lambda \theta_2[\beta](Ag) (e)\}\}]$

$= \lambda \beta [\{e \in CUT: Th(e)=\sigma(BREAD) \wedge \lambda \theta_2[\beta](Ag) (e) \wedge \exists z \in KNIFE (Ins(e)=z)\}]$

ben cut the bread with a knife $\rightarrow$

$\lambda \beta [\{e \in CUT: Th(e)=\sigma(BREAD) \wedge \lambda \theta_2[\beta] (Ag) (e) \wedge \exists z \in KNIFE (Ins(e)=z)\}]$
$(\lambda e[\theta_2(e)=b])$

$= \{e \in CUT: Th(e)=\sigma(BREAD) \wedge \lambda \theta_2[\lambda e[\theta_2(e)=b]] (Ag) (e) \wedge \exists z \in KNIFE (Ins(e)=z)\}$

$= \{e \in CUT: Th(e)=\sigma(BREAD) \wedge Ag(e)=b \wedge \exists z \in KNIFE (Ins(e)=z)\}$

E-closure:

$\exists e \in CUT (Th(e)=\sigma(BREAD) \wedge Ag(e)=b \wedge \exists z \in KNIFE (Ins(e)=z))$

i.e., there is a cutting event whose agent is Ben, whose theme is the bread, and it was carried out using a knife.

6.2.7 The Semantics of the Adverbs

My main concern in this dissertation is to identify the syntactic and semantic properties of the Wijler sentence configuration. I am not studying the semantics of the specific adverbs. For each of the relevant adverbs, I will assume, for the purposes of this dissertation, a certain (possibly simplified) semantic analysis, adapted to my system. I will assume that the adverbs under consideration take either a proposition (denoted by the IP) or a set of events (denoted by the *v*P) or a property of events (either the property denoted by a V-FncP or the one denoted by the VP). Following are my assumptions regarding the lexical information associated with each of the adverbs.

kim'at ('almost'):
Syntax: When in Infl. position, its syntactic argument is the IP.
Semantics (Sevi 1995)*: almost* applies to a single argument, of type t

Let φ be a formula and let I be a discrete set and let $<$ be a three place relation s.t. for every $i^* \in I$, $<_{i*}$ is a strict partial order on I ($i_1 <_{i*} i_2$ is read as i_1 is closer to i^* than i_2). 9almost $\varphi 0^{i^*} = 1$ iff $9\varphi 0^{i^*} = 0$ and there is $i' \in I$, s.t., for any $i'' \in I$, $i' <_{i*} i''$ and $9\varphi 0^{i''} = 1$

We may also allow *kim'at* to apply to properties of events, type $<e,t>$, as follows.
   Let Y be an expression of type $<e,t>$.

   $almost(Y) = \lambda e[almost [Y(e)]],$

Or, somewhat informally:

kim'at(Y) = $\lambda e [\neg Y(e) \wedge$ relative to a minimally more lenient standard of precision, or
             a minimally different possible world, (etc.,) Y(e) $]$

<u>*constraint:*</u> The semantic argument is always the syntactic argument.

Note that the rule does not say that the standard is minimally more lenient; a standard $s' \in S$ (closer to s^* than any arbitrary s") could be either minimally stricter or minimally more lenient, but assuming $9\varphi 0^{s^*} = 0$, φ cannot be true relative to any s' stricter than s^*. Only a minimally more lenient standard s' can be such that $9\varphi 0^{s^*} = 0$ and $9\varphi 0^{s'} = 1$.

lo ('not'):

<u>*Syntax*</u>: When in Infl. position, its syntactic argument is the IP.

<u>*Semantics:*</u> *lo* applies to a single argument, of type t
   Let p be a variable of type t. For any p, $lo(p) = \neg[p]$

We may also allow *lo* to apply to properties of events, type $<e,t>$, as follows.
   Let Y be an expression of type $<e,t>$.
   $lo(Y) = \lambda e[\neg[Y(e)]]$.

<u>*constraint:*</u> The semantic argument is always the syntactic argument.

bekoSi ('barely'):

<u>*Syntax*</u>: When in Infl. position, its syntactic argument is the IP.

<u>*Semantics* (Sevi 1995):</u> *bekoSi* applies to a single argument, of type t
Let φ be a formula and let I be a discrete set and let $<$ be a three place relation s.t. for every $i^* \in I$, $<_{i*}$ is a strict partial order on I ($i_1 <_{i*} i_2$ is read as i_1 is closer to i^* than i_2). 9bekoSi$\varphi 0^{i^*} = 1$ iff $9\varphi 0^{i^*} = 1$ and there is $i' \in I$, s.t., for any $i'' \in I$, $i' <_{i*} i''$ and $9\varphi 0^{i''} = 0$

I argue that *bekoSi* can also apply to expressions of type $<e,t>$, as follows.
   For any expression Y of type $<e,t>$,
   $barely(Y) = \lambda e[barely[Y(e)]],$

Or, somewhat informally:

bekoSi(Y) =   λe[Y(e) ∧ relative to a minimally stricter standard of precision, or a
minimally different possible world, (etc.,) ¬Y(e)]

<u>constraint:</u> The semantic argument is always the syntactic argument.

Note that the rule does not say that the standard is minimally stricter, a standard s'∈S (closer to s* than any arbitrary s") could be either minimally stricter or minimally more lenient, but assuming $9φ0^{s^*}$=1, φ is true relative to any s' more lenient than s*. Only a minimally stricter standard s' can be such that $9φ0^{s^*}$=1 and $9φ0^{s'}$=0.

tamid ('always'):

<u>Syntax</u>: When in Infl, the syntactic argument of tamid is *v*P.<u>Semantics:</u>   *tamid* is an adverb of quantification. It has two arguments of type t: a restriction and a nuclear scope. It contributes a restricted universal quantifier, which may simultaneously bind a series of variables of different types. Part or all of the restriction
may be contextually supplied (rather than based on linguistic material).

<u>constraint 1:</u>   If there is a main clause and an *if*-clause or *when*-clause, then the semantic
material in the *if/when*-clause becomes part of (possibly all of) the
restriction.

<u>constraint 2:</u>   The syntactic argument of *tamid* must be its nuclear scope.

<u>constraint 3:</u>   All the semantic material in the main clause must be included either in the
restriction or in the nuclear scope.

<u>Constraint 4</u>:   *tamid* has a strong tendency to quantify over events and/or times.

e.g.,
A quadratic equation always has a solution.

∀x(quadratic-equation(x)) (∃y (quadratic-equation(x) ∧solution-of(y,x)))

'for **every** quadratic equation, it is an equation and there is a solution of it', which boils down to: for every quadratic equation, there is a solution.

Note: the occurrence of quadratic-equation(x) in the nuclear scope follows from

constraint (2) + the assumption that the syntactic scope of *tamid* in Infl. is the vP.

rak ('only'):

<u>Syntax</u>: When in Infl. position, its syntactic argument is the VP.

<u>Semantics:</u>   *rak* has two arguments:
(i) a **<u>skeleton</u>** – i.e., syntactically: an open formula, or a λ-abstract; semantically:
the set of values for the free variable which verify the open formula = the set
represented by the λ-abstract; and
(ii) a **<u>filled in value</u>** – i.e., an element which can be combined with the <u>skeleton </u>to
produce, syntactically, a closed formula, and semantically, a proposition.

A rough approximation of the semantics of *rak/only*[36]:
Let T,S be variables ranging over possible denotations of the type of the <u>filled-in value</u>, and let P be a variable ranging over possible denotations of the type of the <u>skeleton</u> (of the λ-abstract). For any T,S,P,
$$rak(T,P) = P(T) \wedge \forall S[P(S) \rightarrow S=T]$$

Discourse function: *rak/only* comments on an overly strong expectation concerning the values which verify the skeleton.

constraint 1: The 'skeleton' and 'filled in value' must always constitute a way of factoring out the prejacent (the sentence minus *only*) into two parts (ones which could be combined to yield the prejacent again)[37]

constraint 2: The 'filled in value' must be the syntactic argument[38].

afilu ('even'):

Syntax: When in Infl. position, its syntactic argument is the IP.

Semantics: *afilu* has two arguments:
(i) a **skeleton** – i.e., syntactically: an open formula, or a λ-abstract; semantically: the set of values for the free variable which verify the open formula = the set represented by the λ-abstract; and
(ii) a **filled in value** – i.e., an element which can be combined with the <u>skeleton</u> to produce, syntactically, a closed formula, and semantically, a proposition.
A rough approximation of the semantics of *afilu* ('even'):
Let T,S be variables ranging over possible denotations of the type of the <u>filled-in value</u>, and let P be a variable ranging over possible denotations of the type of the <u>skeleton</u> (of the λ-abstract). For any T,S,P[39],
$$afilu(T,P) = \exists S[S \neq T \wedge P(S)] \wedge P(T) \wedge \forall S'[S' \neq T \rightarrow P(S') \text{ is more likely than } P(T)]$$

constraint 1: The 'skeleton' and 'filled in value' must always constitute a way of factoring out the prejacent (the sentence minus *even*) into two parts (ones which could be combined to yield the prejacent again)

constraint 2: The 'filled in value' must be the syntactic argument.

gam ('also'):

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[36] For a well supported formal analysis of *only*, see Kadmon and Sevi 2010 (closely based on Sevi 2005's semantics for the exhaustivity operator posited in Groenendijk and Stokhof 1984).

[37] The factoring out of the prejacent into a skeleton and a filled-in value looks, of course, a lot like a 'structured meaning'. However, it is not a property of the prejacent as such, and does not correspond to any grammatical marking of any constituent in the prejacent as a focus. Rather, it is a conventionally imposed way of figuring out what the two arguments required by the semantics of *only* might actually be.

[38] I depart here from Sevi 2005, for whom the 'filled in value' can be any part of the syntactic argument.

[39] For simplicity I collapse the additive presupposition and the assertion into this one rule.

Syntax: When in Infl. position, its syntactic argument is the IP.

Semantics: *gam* has two arguments:

> (i) a **skeleton** – i.e., syntactically: an open formula, or a λ-abstract; semantically: the set of values for the free variable which verify the open formula = the set represented by the λ-abstract; and
> (ii) a **filled in value** – i.e., an element which can be combined with the skeleton to produce, syntactically, a closed formula, and semantically, a proposition.
>> A rough approximation of the semantics of *gam* ('also'):
> Let T,S be variables ranging over possible denotations of the type of the filled-in value, and let P be a variable ranging over possible denotations of the type of the skeleton (of the λ-abstract). For any T,S,P,
> *gam*(T,P)= ∃S[S≠T ∧ P(S)] ∧ P(T)

> *constraint 1:* The 'skeleton' and 'filled in value' must always constitute a way of factoring out the prejacent (the sentence minus *only*) into two parts (ones which could be combined to yield the prejacent again)
> *constraint 2:* The 'filled in value' must be the syntactic argument.

With these assumptions in place, I can now turn to showing how the proposed theory accounts for the data presented throughout this dissertation.

6.3 Predicting the Data

6.3.1 Existential Entailment of *not* and *almost*

Consider the contrast presented above between (10a) and (10b):

> (10) a *Sara almost kissed all girls ...and in fact she did not kiss anybody*
>
>   b *Sara kissed almost all girls ...#and in fact she did not kiss anybody*

Let us start with the Infl sentence (10a). *almost* in Infl takes the IP as its syntactic argument, and the proposition denoted in the IP as its semantic argument.

kissed → λαλβ[{e∈KISS : λθ₁[α](Th) (e) ∧ [λθ₂[β]](Ag) (e)}]

V-Fnc₁ → λdλe[θ₁(e)=d]   type <d,pow(e)>

ten girls → λP[∃y∈*GIRL (│z│=10 ∧P(z))]   type <<d,t>,t>

Assume T is a variable of type <<d,t>,t>.

Lift V-Fnc₁ from type <d,pow(e)> to type <T,pow(e)>:

Lifted *V-Fnc₁* → λTλe[T (λx[θ₁(e)=x])]

Applying lifted *V-Fnc₁* to *ten girls*:

$\lambda T \lambda e[T(\lambda x[\theta_1(e)=x])]$ $(\lambda P[\exists y \in {}^*GIRL(|z|=10 \wedge P(z))])$

$= \lambda e[\lambda P[\exists y \in {}^*GIRL(|z|=10 \wedge P(z))](\lambda x[\theta_1(e)=x])]$

$= \lambda e[\exists y \in {}^*GIRL(|z|=10 \wedge \lambda x[\theta_1(e)=x](z))]$

$= \lambda e[\exists y \in {}^*GIRL(|z|=10 \wedge \theta_1(e)=z)]$

I.e., the property of an event of which the thematic role associated with the lexical argument of V-Fnc₁ is filled in with *ten girls*

kissed ten girls $\rightarrow \lambda\alpha\lambda\beta[\{e \in KISS: \lambda\theta_1[\alpha](Th)(e) \wedge \lambda\theta_2[\beta](Ag)(e)\}]$
$(\lambda e[\exists y \in {}^*GIRL(|z|=10 \wedge \theta_1(e)=z)])$

$= \lambda\beta[\{e \in KISS: \lambda\theta_1[\lambda e[\exists y \in {}^*GIRL(|z|=10 \wedge \theta_1(e)=z)]](Th)(e) \wedge \lambda\theta_2[\beta](Ag)(e)\}]$

$= \lambda\beta[\{e \in KISS: \lambda e[\exists y \in {}^*GIRL(|z|=10 \wedge Th(e)=z)](e) \wedge \lambda\theta_2[\beta](Ag)(e)\}]$

$= \lambda\beta[\{e \in KISS: \exists y \in {}^*GIRL(|z|=10 \wedge Th(e)=z) \wedge \lambda\theta_2[\beta](Ag)(e)\}]$

sara kissed 10 girls $\rightarrow$

$\lambda\beta[\{e \in KISS: \exists y \in {}^*GIRL(|z|=10 \wedge Th(e)=z) \wedge \lambda\theta_2[\beta](Ag)(e)\}](\lambda e[\theta_2(e)=s])$

$= \{e \in KISS: \exists y \in {}^*GIRL(|z|=10 \wedge Th(e)=z) \wedge \lambda\theta_2[\lambda e[\theta_2(e)=s]](Ag)(e)\}$

$= \{e \in KISS: \exists y \in {}^*GIRL(|z|=10 \wedge Th(e)=z) \wedge Ag(e)=s\}$

E-closure:

$\exists e \in KISS(\exists y \in {}^*GIRL(|z|=10 \wedge Th(e)=z) \wedge Ag(e)=s)$

almost[*sara kissed 10 girls*] $\rightarrow$

$\neg\exists e \in KISS(\exists y \in {}^*GIRL(|z|=10 \wedge Th(e)=z) \wedge Ag(e)=s) \wedge$ relative to a minimally more lenient standard of precision, or a minimally different possible world
$\exists e \in KISS(\exists y \in {}^*GIRL(|z|=10 \wedge Th(e)=z) \wedge Ag(e)=s)$

♦ Since the negation introduced by *almost* scopes over the existential
closure, we correctly predict no existential entailment.

Let us turn now to (10b), where there is an existential entailment.

almost (V-Fnc₁+ten girls) $\rightarrow \lambda e'[$ *almost* $[\lambda e[\exists y \in {}^*GIRL(|z|=10 \wedge \theta_1(e)=z)](e')]]$

$= \lambda e'[$ *almost* $[\exists y \in {}^*GIRL(|z|=10 \wedge \theta_1(e')=z)]]$

kissed almost ten girls →

$\lambda\alpha\lambda\beta[\{e\in KISS : \lambda\theta_1[\alpha](Th)(e) \wedge \lambda\theta_2[\beta](Ag)(e)\}]$

$\qquad\qquad (\lambda e'[almost\ [\exists y\in {}^*GIRL\ (\mid z\mid=10 \wedge \theta_1(e')=z)]])$

$= \lambda\beta[\{e\in KISS : \lambda\theta_1[\lambda e'[almost\ [\exists y\in {}^*GIRL\ (\mid z\mid=10 \wedge \theta_1(e')=z)]](Th)(e) \wedge$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad \lambda\theta_2[\beta](Ag)(e)\}]$

$= \lambda\beta[\{e\in KISS : \lambda e'[almost\ [\exists y\in {}^*GIRL\ (\mid z\mid=10 \wedge Th(e')=z)]](e) \wedge \lambda\theta_2[\beta](Ag)$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad (e)\}]$

$= \lambda\beta[\{e\in KISS : almost\ [\exists y\in {}^*GIRL\ (\mid z\mid=10 \wedge Th(e)=z)] \wedge \lambda\theta_2[\beta](Ag)(e)\}]$

sara kissed almost ten girls →

$\lambda\beta[\{e\in KISS : almost\ [\exists y\in {}^*GIRL\ (\mid z\mid=10 \wedge Th(e)=z)] \wedge \lambda\theta_2[\beta](Ag)(e)\}]$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad (\lambda e[\theta_2(e)= s])$

$= \{e\in KISS : almost\ [\exists y\in {}^*GIRL\ (\mid z\mid=10 \wedge Th(e)=z)] \wedge \lambda\theta_2[\lambda e[\theta_2(e)= s](Ag)(e)\}$

$= \{e\in KISS : almost\ [\exists y\in {}^*GIRL\ (\mid z\mid=10 \wedge Th(e)=z)] \wedge Ag(e)=s\}$

E-closure:

$\exists e\in KISS\ (almost\ [\exists y\in {}^*GIRL\ (\mid z\mid=10 \wedge Th(e)= z)] \wedge Ag(e)= s)$

$= \exists e\in KISS\ (\ \neg\exists y\in {}^*GIRL\ (\mid z\mid=10 \wedge Th(e)= z) \wedge$ relative to a minimally more lenient standard of precision, or a minimally different possible world $\exists y\in {}^*GIRL\ (\mid z\mid=10 \wedge Th(e)= z) \wedge Ag(e)= s)$

i.e. there is a kissing event s.t. its agent is Sara, and it is not the case that its theme is a sum of ten girls, but relative to a minimally more lenient standard, or a minimally different possible world, its theme is a sum of ten girls.

♦ The existential quantifier scopes over the negation introduced by *almost*, and we correctly predict an existential entailment.

As we have already observed, negation too has an existential entailment in Wijler sentences, which would be derived in the same way. Consider:

(18) a   ha'iSa lo xacta et hakviS bemaavar haxacaya
    the-woman not crossed acc-the street at the pedestrian crossing

    …ve basof hi lo xacta bixlal
    and in the end she did not cross at all

    b   ha'iSa xacta et hakviS lo bemaavar haxacaya
    the-woman crossed acc-the street not at the pedestrian crossing

…#ve basof hi lo xacta bixlal
and in the end she did not cross at all

Let us start with (18b). Since *not at the pedestrian crossing* takes the VP as its argument, let us first derive the VP:

Cross the street→

$\lambda\alpha\lambda\beta[\{e\in CROSS : \lambda\theta_1[\alpha](Th)\ (e) \wedge \lambda\theta_2[\beta](Ag)\ (e)\}]\ (\lambda e[\theta_1=\sigma(STREET)])$

$= \lambda\beta[\{e\in CROSS : \lambda\theta_1[\lambda e[\theta_1=\sigma(STREET)]](Th)\ (e) \wedge \lambda\theta_2[\beta](Ag)\ (e)\}]$

$= \lambda\beta[\{e\in CROSS : Th(e)=\sigma(STREET) \wedge \lambda\theta_2[\beta](Ag)\ (e)\}]$

V-Fnc+at the pedestrian crossing $\rightarrow \lambda e[Loc(e)=\sigma(PC)]$

not [*V-Fnc+at the pedestrian crossing*] $\rightarrow$

$\lambda e'[\neg[\lambda e[Loc(e)=\sigma(PC)]\ (e')]]$

$= \lambda e'[\neg Loc(e')=\sigma(PC)]$

Since the V-FncP *not at the pedestrian crossing* takes the VP as its argument, it must be lifted from type <e,t> to type <<e,t>,pow(e)>, <<e,t>,pow(e)>>.

LIFT [*not at the pedestrian crossing*] $\rightarrow$

$\lambda VP\ \lambda\gamma[\{e\in E : \lambda e'[\neg Loc(e')=\sigma(PC)]\ (e) \wedge e\in VP(\gamma)\}]$

$= \lambda VP\ \lambda\gamma[\{e\in E : \neg Loc(e)=\sigma(PC) \wedge e\in VP(\gamma)\}]$ <<e,t>pow(e)>, <<e,t>,pow(e)>>

Now this V-FncP takes the VP as its argument:

$\lambda VP\ \lambda\gamma[\{e\in E : \neg Loc(e)=\sigma(PC) \wedge e\in VP(\gamma)\}]$
              $(\lambda\beta[\{e\in CROSS : Th(e)=\sigma(STREET) \wedge \lambda\theta_2[\beta](Ag)\ (e)\}])$

$= \lambda\gamma[\{e\in E : \neg Loc(e)=\sigma(PC) \wedge e\in \lambda\beta[\{e\in CROSS : Th\ (e)=\sigma(STREET) \wedge$
                            $[\lambda\theta_2[\beta]](Ag)\ (e)\}](\gamma)\}]$

$= \lambda\gamma[\{e\in CROSS : Th(e)=\sigma(STREET) \wedge \lambda\theta_2[\gamma](Ag)\ (e) \wedge \neg Loc(e)=\sigma(PC)\}]$

the woman crossed the street not at the pedestrian crossing $\rightarrow$

$\lambda\gamma[\{e\in CROSS : Th(e)=\sigma(STREET) \wedge \lambda\theta_2[\gamma](Ag)\ (e) \wedge \neg Loc(e)=\sigma(PC)\}]$
                               $(\lambda e[\theta_2(e)=\sigma(WOMAN)])$

$= \{e\in CROSS : Th(e)=\sigma(STREET) \wedge \lambda\theta_2[\lambda e[\theta_2(e)=\sigma(WOMAN)]](Ag)\ (e) \wedge$

$$\neg Loc(e)=\sigma(PC)\}$$

$$=\{e\in CROSS : Th(e)=\sigma(STREET) \wedge Ag(e)=\sigma(WOMAN) \wedge \neg Loc(e)=\sigma(PC)\}$$

E-closure:

$$\exists e\in CROSS \; (Th(e)=\sigma(STREET) \wedge Ag(e)=\sigma(WOMAN) \wedge \neg Loc(e)=\sigma(PC))$$

i.e., there is a crossing event whose agent is the woman, whose theme is the street, and whose location is not the pedestrian crossing

This analysis accounts for the existential entailment of (18b), since the negation is under the existential closure.

As for (18a), the syntactic argument of the adverb in Infl. is the IP and the semantic argument is the proposition. It is easy to see that its semantic derivation would end up as follows:

$$\neg \exists e\in CROSS \; (Th(e)=\sigma(ST) \wedge Ag(e)= \sigma(WOMAN) \wedge Loc(e)=\sigma(PC))$$

i.e., its is not the case that there is a crossing s.t., its agent is the woman, and its theme is the street and its location is the pedestrian crossing.

This does not entail the existence of an event of crossing.

Thus, the proposed theory has been shown to account for:

♦ The existential entailment of Wijler sentences with *not* and *almost*.

6.3.2 The '*but-rather*' Conjunct with Negation and Restrictions on the Interpretation of *almost*

6.3.2.1 The Occasionally Obligatory *'but-rather'* Conjunct and the Constraint on Arguments of Verbs

Another fact for which my theory needs to account is the occasionally obligatory but-rather conjunct (e.g., (12b): #*Max kissed not acc Lucy* vs. (12c): *Max kissed not acc Lucy but rather acc Bracha*).

Let us begin with the unacceptable (12b).

V-Fnc$_1$+lucy$\rightarrow \lambda e[\theta_1(e)=l]$

not(V-Fnc$_1$+lucy) $\rightarrow \lambda e'[\neg \lambda e[\theta_1(e)=l](e')]] \;=\; \lambda e'[\neg \theta_1(e')=l]$ type $<e,t>$

kiss → λαλβ[{e∈KISS: λθ$_1$[α](Th) (e) ∧ λθ$_2$[β](Ag) (e)}]

kiss not Lucy→

λαλβ[{e∈KISS: λθ$_1$[α] (Th) (e) ∧ λθ$_2$[β] (Ag) (e)}](λe'[¬ θ$_1$(e')=l])

= λβ[{e∈KISS: λθ$_1$[λe'[¬ θ$_1$(e')=l]](Th) (e) ∧ λθ$_2$[β](Ag) (e)}]

= λβ[{e∈KISS: λe'[¬Th (e')=l](e) ∧ λθ$_2$[β] (Ag) (e)}]

= λβ[{e∈KISS: ¬Th(e)=l ∧ λθ$_2$[β](Ag) (e)}]

Max kiss not Lucy→

λβ[{e∈KISS: ¬Th(e)=l ∧ λθ$_2$[β] (Ag) (e)}](λe[θ$_2$(e)=m])

={e∈KISS: ¬Th(e)=l ∧ λθ$_2$[λe[θ$_2$(e)=m]](Ag) (e)}

={e∈KISS: ¬Th(e)=l ∧ λe[Ag(e)=m] (e)}

={e∈KISS: ¬Th(e)=l ∧ Ag(e)=m}

E-closure:

∃e∈KISS (¬Th(e)=l ∧ Ag(e)=m)

i.e., there is an event of kissing whose agent is Max and whose theme is not Lucy

Well, we did derive a meaning for (12b), but since it is in fact unacceptable, we must say something more about it. Intuitively, the problem with (12b) is that *kiss* requires that **there be someone** that Max kissed, and so (12b) fails to assign an individual to fill in an *obligatory thematic role*. This intuition draws an analogy between the unacceptability of sentences like *Max kissed, where the theme argument is missing, and the unacceptability of (12b).

However, since I assumed that the semantics of the verb is a function from *event properties* to sets of events, then there is nothing to prevent me from placing the property *λe[¬θ$_1$(e)=l]* as the value of α as in the above derivation. We need to say something more about the event properties which serve as the arguments of the verb (the properties which after λ-conversion are 'filled in' for the variables α,β, etc. in the translation of the verb). We must ensure, roughly, that each property specify for some thematic role of the event that it is 'filled in' with some expression of type d (constant or variable).

I therefore stipulate the following constraint:

<u>Constraint on the Arguments of Verbs</u>:

An expression α of type $<e,t>$ may serve as an argument of a verb only if the following condition holds.

For any M,g, and any event $\mathbf{e} \in E$,

if $v\alpha b_{M,g}(\mathbf{e})=1$ then $v\lambda e[\theta(e)=\mathbf{x}]b_{M,g}(\mathbf{e})=1$,

for some expression θ of type $<e,d>$ and expression $\mathbf{x}$ of type d.

This constraint determines that we cannot take a property of events as the nth argument of a verb unless it **entails that the thematic role associated with the lexical argument of V-fnc$_n$ is filled in with some individual** (be it the value of a constant or of a variable). Given this stipulation, *not(V-Fnc$_1$+lucy)*, translated as $\lambda e[\neg\theta_1(e)=l]$, can no longer be the argument of *kiss* (it cannot after λ-conversion replace the variable α), because it does not entail an individual filling in the thematic role associated with θ_1. Hence, we correctly predict the unacceptability of (12b).

The reason for the contrast between (18b) '*the woman crossed not at the pedestrian crossing*' and (12b) is that the V-FncP *not at the pedestrian crossing* is not an argument of the verb, and therefore, the above constraint does not apply to it.

Let us turn now to the acceptable (12c: *Max kissed not acc Lucy, but-rather acc Bracha*). I propose that syntactically '*not acc Lucy but-rather acc Bracha*' is a conjunction of two V-Fnc$_n$Ps. I will argue that semantically, they form a conjunction of two properties of events, which yields a conjoined property of events. Let us see how this works:

not V-Fnc$_1$+ Lucy $\rightarrow$ $\lambda e[\neg\theta_1(e)=l]$

V-Fnc$_1$+ Bracha $\rightarrow$ $\lambda e[\theta_1(e)=b]$

I assume the following conjunction rule for properties of events.

If $\alpha \in <e,t>$ and $\beta \in <e,t>$ then $v\alpha \wedge \beta b_{M,g} = \lambda e[\alpha(e) \wedge \beta(e)]$

not V-Fnc$_1$ Lucy but rather V-Fnc$_1$ Bracha $\rightarrow$

$\lambda e[\neg\theta_1(e)=l] \wedge \lambda e[\theta_1(e)=b]$

$=\lambda e' [\lambda e [\neg\theta_1(e)=l] (e') \wedge \lambda e[\theta_1(e)=b] (e')]$

$=\lambda e' [\neg\theta_1(e')=l \wedge \theta_1(e')=b]$

i.e., the property of an event of which the thematic role associated with the lexical argument of V-Fnc$_1$ is not filled in with the individual Lucy and it is filled in with the

individual Bracha

This satisfies our constraint on the arguments of verbs since it entails $\lambda e'[\theta_1=b(e')]$ (the property of an event of which the thematic role associated with the the lexical argument of V-Fnc$_1$ is filled in with Bracha). Thus, we correctly predict (12c) to be acceptable.

Let us turn now to (13: *Max kissed someone who was not Lucy*), which is not more informative than (12b) concerning the identity of the individual filing in the theme role, but is nevertheless acceptable. This results because this sentence succeeds in filling in the theme role with a type d expression.

Someone who is not Lucy $\rightarrow \lambda P[\exists z\ (z{\neq}l \wedge P(z)]$

Since the expression *Someone who is not Lucy* is of type $<<d,t>,t>$, *V-Fnc$_1$* must be lifted accordingly. Applying the lifted *V-Fnc$_1$* to *Someone who is not Lucy*, we get:

$\lambda T\lambda e[T\ (\ \lambda x[\theta_1(e)=x]\ )]\ \ (\ \lambda P[\exists z\ (z{\neq}l \wedge P(z))]\ )$

$= \lambda e\ [\ \lambda P[\exists z\ (z{\neq}l \wedge P(z))]\ (\ \lambda x[\theta_1(e)=x]\ )\ ]$

$= \lambda e[\exists z(z{\neq}l \wedge \lambda x[\theta_1(e)=x]\ (z))]$

$= \lambda e[\exists z\ (\ z{\neq}l \wedge \theta_1(e)=z)]$

Clearly, this expression has a type d expression (the variable z) filling in the thematic role to be associated with θ_1 (in (13), it is the theme role), and we correctly predict the sentence to be acceptable.

6.3.2.2 The Constraint on Arguments of Verbs and the Restrictions on the Interpretation of *kim'at* ('almost') in Wijler sentences

Unsurprisingly, the constraint on arguments of verbs also affects the semantics of *almost*. Consider the following examples.

(19) a   sara kim'at pag'a bamatara
        Sara almost hit in-the-target (Sara almost hit the target)

     b   sara pag'a kim'at bamatara
         Sara hit almost in-the-target (Sara hit almost the target)

(20) a   sara kim'at pag'a be-lusi

Sara almost hit in-Lucy (Sara almost hit Lucy)

b   #sara pag'a kim'at be-lusi
Sara hit almost in-Lucy (Sara hit almost Lucy)

Let us first see what interpretations we derive for the Infl. sentence (19a):

hit → $\lambda\alpha\lambda\beta[\{e\in HIT: \lambda\theta_1[\alpha](Th)\ (e) \wedge \lambda\theta_2[\beta](Ag)\ (e)\}]$

hit the target→

$\lambda\alpha\lambda\beta[\{e\in HIT: \lambda\theta_1[\alpha](Th)\ (e) \wedge \lambda\theta_2[\beta](Ag)\ (e)\}](\lambda e[\theta_1(e)= \sigma TARGET])$

$= \lambda\beta[\{e\in HIT: \lambda\theta_1[\lambda e[\theta_1(e)= \sigma TARGET]](Th)\ (e) \wedge \lambda\theta_2[\beta](Ag)\ (e)\}]$

$=\lambda\beta[\{e\in HIT: Th(e)= \sigma TARGET \wedge \lambda\theta_2[\beta](Ag)\ (e)\}]$

Sara hit the target→

$\lambda\beta[\{e\in HIT: Th(e)= \sigma TARGET \wedge \lambda\theta_2[\beta](Ag)\ (e)\}]\ (\lambda e[\theta_2(e)=s])$

$=\{e\in HIT: Th(e)= \sigma TARGET \wedge \lambda\theta_2\ [\lambda e[\theta_2(e)=s]](Ag)\ (e)\}$

$=\{e\in HIT: Th(e)= \sigma TARGET \wedge Ag(e)=s\}$

E-closure:

$\exists e\in HIT\ (Th(e)= \sigma TARGET \wedge Ag(e)=s)$

kim'at (Sara hit the target)→

$\neg\exists e\in HIT\ (\ Th(e)= \sigma TARGET \wedge Ag(e)=s) \wedge$ relative to a minimally more lenient standard /a minimally different possible world, $\exists e\in HIT\ (\ Th(e)= \sigma TARGET \wedge Ag(e)=s)$

i.e., It is not the case that Sara hit *the target,* but relative to a minimally more lenient standard/a minimally different possible world Sara did hit the target

Possible contexts in which (19a) could be used:

(a) A minimally different possible world:

> (On a computer game): Sara came close to hitting the target when the computer broke down: in the actual world she did not hit the target, but in a minimally different world in which the computer broke down just a little later, she did hit the target.

(b) A minimally different (more lenient) standard:

> (On the same game): Sara hit a location which is not the target relative to the contextually accepted standard, but relative to a minimally more lenient standard it would be considered within the target (i.e., it is spatially proximate

to the target).

Let us turn now to (19b) (*Sara hit almost the target*). *kim'at* 'almost' takes V-FncP$_1$ 'be-the-target' as its syntactic and semantic argument.

almost (*the target*) $\rightarrow$ λe'[*almost* [λe[θ_1(e)= σTARGET] (e')]]
= λe'[*almost* [θ_1(e')= σTARGET]]
= λe'[$\neg\theta_1$(e')=σTARGET $\wedge$ relative to a minimally more lenient standard of precision or
  a minimally different possible world θ_1(e')=σTARGET]

i.e., the property of an event of which the thematic role associated with the lexical argument of V-Fnc$_1$ is not filled in with *the target*, and relative to a minimally more lenient standard of precision or a minimally different possible world, the thematic role associated with the lexical argument of V-Fnc$_1$ is filled in with *the target*.

hit almost the target$\rightarrow$

$\lambda\alpha\lambda\beta$[{e$\in$HIT: $\lambda\theta_1$[α](Th) (e) $\wedge$ $\lambda\theta_2$[β](Ag) (e)}]
(λe'[$\neg\theta_1$(e')=σTARGET $\wedge$ relative to a minimally more lenient standard of precision or a
                minimally different possible world θ_1(e')=σTARGET])

But is this a legitimate move?

According to the constraint on arguments of verbs, the argument must entail a property that an event has if one of its thematic roles is filled in with some individual. Well, suppose the minimally different world had to do with the computer breaking down. Then relative to a minimally different world, e.g., a world in which the computer broke down just a little bit later and the target was hit, *the target* was the theme of this event. But this does not entail that anything has in fact (in the real world) been hit and can be said to fill the theme role. So such an interpretation is blocked by our constraint.

That leaves us with the option of a more lenient standard for the theme being the target. World knowledge tells us that the object which we consider the target could be spatially narrow or spatially broader. This is illustrated in the diagram below with a narrow black circle in the middle and a gray broader one around it.
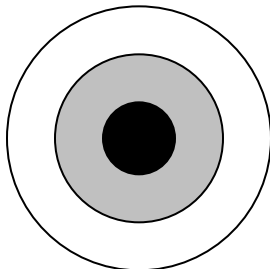
Suppose the more lenient view is that the black+gray circle is the target. Then when would it be true that relative to a minimally more lenient standard the theme of the event was 'the target'? It would work only if the arrow has in fact hit the gray circle (which relative to a minimally more lenient standard is part of the target). That is, we interpreted the sentence as 'Sara hit something else (not the target, relative to a strict standards), which could be considered 'the target' relative to a minimally more lenient standard'. So the event has an individual which is its theme (the gray circle in the above diagram), and I correctly predict this interpretation to be possible.[40]

Now what happens if, given the properties of the object, world knowledge etc., such an interpretation could not be established? That is the case for instance in (20b): *Sara hit almost Lucy*. We cannot assume a standard by which a given object is Lucy relative to some but not all standards; a person is either Lucy or not. In such a case, we cannot apply *almost* to *Lucy* without violating the constraint on arguments of verbs, and I correctly predict that (20b) is unacceptable. Of course there is no such restriction on the Infl. sentence, because the verb takes as its argument the V-Fnc$_1$P *be-lusy*, not modified by *almost*. (*almost* applies to the whole proposition.)

To sum up what we have seen so far:

♦ I showed that the proposed theory accounts for the existential entailment with negation and *almost*.

    o I stipulated the constraint on arguments of verbs determining that we cannot take a property of events as the nth argument of a verb unless it **entails that the thematic role associated with the lexical argument of V-fnc$_n$ is filled in with some individual** (be it the value of a constant or of a variable).

♦ I showed that given this constraint, the proposed theory accounts for:

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[40] Note that (10): '*Sara kissed almost ten girls'*, works in the same way. Relative to a strict standard Sara did not kiss ten girls, but we could apply a more lenient standard to 'ten girls' relative to which even if she kissed only eight or nine girls it would be considered that she did kiss ten girls, but that implies that there is a sum of girls that she did kiss.

❖ The obligatory but-rather conjunct with arguments of the verb

❖ The fact that it is not obligatory with optional event modifiers

❖ The restriction on the meaning of *almost* in Wijler sentences

6.3.3   The Restrictions on the Interpretation of *bekoSi* ('barely')

Consider (21).

(21)   a   #ben diber bekoSi im sara
           Ben talked barely with Sara

   b   ben bekoSi diber im sara
       Ben barely talked with Sara

A possible interpretation of (21b) is that Ben talked to Sara in the actual world, but if his older brother hadn't taken him by the hand so to speak, he would probably have retreated and never said a word to her. Crucially, this reading is not possible for (21a). Let us see how we explain this.

I repeat below my assumptions about the lexical information concerning *bekoSi* ('barely'):

Lexical information about bekoSi ('barely'):
Syntax: When in Infl. position, its syntactic argument is the IP.

Semantics (Sevi 1995)*:* *bekoSi* applies to a single argument, of type t
Let φ be a formula and let I be a discrete set and let < be a three place relation s.t. for every $i^* \in I$, $<_{i*}$ is a strict partial order on I ($i_1 <_{i*} i_2$ is read as i_1 is closer to i^* than i_2).
$⟨bekoSi\varphi⟩^{i^*} = 1$ iff $⟨\varphi⟩^{i^*} = 1$ and there is $i' \in I$, s.t., for any $i'' \in I$, $i' <_{i*} i''$ and $⟨\varphi⟩^{i''} = 0$

I argue that *bekoSi*can may also apply to expressions of type <e,t>, as follows.
For any expression Y of type <e,t>,
$⟨bekoshi(Y(e))⟩^{i^*} = 1$ iff $⟨Y(e)⟩^{i^*} = 1$ and there is $i' \in I$, s.t., for any $i'' \in I$, $i' <_{i*} i''$ and $⟨Y(e)⟩^{i'} = 0$

Or, somewhat informally:
$bekoSi(Y) = \lambda e[Y(e) \wedge$ relative to a minimally stricter standard of precision, or a minimally different possible world, (etc.,) $\neg Y(e)]$

constraint: The semantic argument is always the syntactic argument.

Note that the rule does not say that the standard is minimally stricter, a standard $s' \in S$ (closer to s^* than any arbitrary s") could be either minimally stricter or minimally more

lenient, but assuming $9\varphi0^{s^*}=1$, φ cannot be true relative to any s' more lenient than s^*. Only a minimally stricter standard s' can be such that $9\varphi0^{s^*}=1$ and $9\varphi0^{s'}=0$.

Now, let us derive the unacceptable (21a).

barely to Sara:

barely ($\lambda e[\theta_1(e)=s]$) $\rightarrow$

$\lambda e'$ [$\lambda e[\theta_1(e)=s]$ (e') $\wedge$ relative to a minimally stricter standard / minimally different possible world $\neg\lambda e[\theta_1(e)=s]$ (e')]

= $\quad\lambda e'$ [$\theta_1(e')=s$ $\wedge$ relative to a minimally stricter standard / minimally different possible world $\neg\theta_1(e')=s$]

I.e., the property an event of which the thematic role associated with the lexical argument of V-Fnc$_1$ is filled in with *Sara*, but relative to a minimally stricter standard / different possible world the lexical argument of V-Fnc$_1$ is not filled in with *Sara*

The above property of events satisfies the condition imposed by the constraint on arguments of verbs, so it can serve as the argument of *talked*.

talked barely with Sara $\rightarrow$

$\lambda\alpha\lambda\beta[\{e\in TALK : \lambda\theta_1[\alpha](Th) (e) \wedge \lambda\theta_2[\beta](Ag) (e)\}](barely (\lambda e' [\theta_1(e')=s]))$

= $\lambda\beta[\{e\in TALK : \lambda\theta_1[barely (\lambda e' [\theta_1(e')=s])](Th) (e) \wedge \lambda\theta_2[\beta](Ag) (e)\}]$

= $\lambda\beta[\{e\in TALK : barely (Th (e)=s) \wedge \lambda\theta_2[\beta](Ag) (e)\}]$

Ben talked barely with Sara $\rightarrow$

$\lambda\beta[\{e\in TALK : barely (Th (e)=s) \wedge \lambda\theta_2[\beta]](Ag) (e)\}(\lambda e[\theta_1(e)=b])$

= $\{e\in TALK : barely (Th (e)=s) \wedge \lambda\theta_2[\lambda e[\theta_1(e)=b]](Ag) (e)\}$

= $\{e\in TALK : barely (Th (e)=s) \wedge Ag (e)=b\}$

E-closure:

$\exists e\in TALK (barely (Th (e)=s) \wedge Ag (e)=b)$

I.e., there is an event of talking whose agent is Ben and whose theme is Sara, and relative to a minimally stricter standard /minimally different world its theme is not Sara

Why doesn't this yield an acceptable reading for (21a)? Let us see what it could mean.

One possibility would be to interpret the property of the theme being Sara relative to precision standards, s.t. the theme was Sara relative to a contextually accepted

standard, but not so relative to a minimally stricter standard. However, this reading is unavailable, because a person is or isn't Sara relative to every standard.

Another possibility would be to use possible worlds, s.t. the theme was Sara in the real world, but not in some minimally different world. But how do we know what counts as a minimally different possible world? Suppose we take a probability scale, consisting of the following possibilities: Ben talked to Debbie, Ben talked to Lucy, Ben talked to Sara,,…, ordered with respect to how probable or improbable each of the girls is for Ben to talk to – Lucy is highly probable for him to approach (maybe because she is his cousin who lives next door), Sara is also probable for him to approach, but a little less so (maybe she is a girl who works with him on the science project at school), while (popular cheer leader) Debbie is highly improbable for him to approach. Then we could think that in the real world Ben talked to Sara, but in a minimally different world he talked to a girl he is more likely to talk to, viz., Lucy. The scale is dependent on the episode depicted in the sentence; in particular, it depends on what we know of Ben's habits in talking to girls. I will propose that the reason that we don't get an interpretation along these lines for (21a) lies in the organizing principle underlying the scale.

When the adverb modifies the IP, the organizing principle for a scale based on which we can identify possible worlds as being more or less similar to the real world is based on the episode depicted in the sentence. For example in (21b): *Ben barely talked to Sara*, we can have a reading where the organizing principle involves Ben's habits in talking to girls, with possible worlds ordered according to how probable or improbable it is for Ben to talk to a given girl.

I propose that (21a) cannot be interpreted relative to the same scale, because the adverb does not comment on the **event depicted in the sentence**, but rather on the claim that ***the theme is Sara***. My claim is that the syntax of Wijler sentences determines that the organizing principle underlying the scale may not be based on the event depicted in the sentence.

Note that the fact that the syntax restricts possible interpretations of an adverb is not some esoteric property of *barely* in Wijler sentences. In fact, this is a special case of the principle of compositionality in the semantics of adverbs, discussed in the previous chapter. Consider for example McConell Ginet's example (repeated from chapter 5):

(22) a   Sally rudely left the party

   b   Sally left the party rudely

McConell-Ginet observed that (22a) is interpreted as a comment on the event of Sally's leaving characterizing it as showing rudeness in Sally, and (22b) adds a restriction on the set of events saying that they have a property of a rude manner. McConell-Ginet argued that *rudely* lexically allows both readings, but restrictions on the set of events are introduced by arguments (or modifiers) in the VP, whereas a comment on a specific event (e.g., on what it shows about the agent) is only compatible with the projections above the VP. The distinction between *bekoSi* ('barely') in Wijler sentences and in Infl. sentences is similar; when *bekoSi* 'barely' modifies one property of a given event, it may not make use of a scale organized based on information about the entire event.

One could imagine that the claim that the theme of the event is Sara in (21b) could be interpreted as true or not true relative to different possible worlds based exclusively on the claim that *the theme is Sara*. Well, what would the organizing principle be, such that we could say that the claim that the theme is Sara is true relative to the world of evaluation and false relative to a minimally different world? There is no organizing principle that suggests itself. If we could find such an organizing principle, the prediction is that the sentence would be acceptable.

Based on the discussion so far, one could wonder how come there are any acceptable Wijler sentences with *bekoSi* ('barely') at all. This issue will be addressed in chapter 7 below.

To conclude:

♦ I argued that the interpretation of *bekoSi* 'barely' could not make use
   of a scale based on the information in the event in the sentence.

I showed that the proposed theory accounts for the unacceptability of many *bekoSi* Wijler sentences.

6.3.4   Restrictions on the Semantics of *tamid* ('always')

Consider the following example:

(23) a   ben tamid metaken et hamexonit hakxula
        Ben always fixes acc the—car   the-blue

        …ve hu gam metaken et hatraktor
          and he also fixes acc the-tractor

     b   ben metaken tamid et hamexonit hakxula
        Ben fixes   always acc the-car   the-blue

        #…ve hu gam metaken et hatraktor
          and he also fixes   acc the-tractor

The contrast between (23a) and (23b) results because (23a) may but need not be interpreted as exhaustive (implying that there are no events in which Ben fixes anything other than the blue car), whereas in (23b) that is the only possible interpretation. Let us see how we explain this fact.

I assume the following lexical information about *tamid*:

tamid 'always';

Syntax: When in Infl, the syntactic argument of tamid is *v*P,

Semantics: *tamid* is an adverb of quantification. It has two arguments of type t: a restriction and a nuclear scope. It contributes a restricted universal quantifier, which may simultaneously bind a series of variables of different types. Part or all of the restriction may be contextually supplied (rather than based on linguistic material).

constraint 1:   If there is a main clause and an *if*-clause or *when*-clause, then the semantic material in the *if/when*-clause becomes part of (possibly all of) the restriction.
constraint 2:   The syntactic argument of *tamid* must be its nuclear scope.
constraint 3:   All the semantic material in the main clause must be included either in the restriction or in the nuclear scope.
Constraint 4:   *tamid* has a strong tendency to quantify over events and/or times.

e.g.,
A quadratic equation always has a solution.

$$\forall x \big(\text{quadratic-equation}(x) \big) \big(\exists y \,(\text{quadratic-equation}(x) \wedge \text{solution-of}(y,x))\big)$$

'for **every** quadratic equation, it is an equation and there is a solution of it' which boils down to: for every quadratic equation, there is a solution.

Note: the occurrence of quadratic-equation(x) in the nuclear scope follows from constraint (2) + the assumption that the syntactic scope of *tamid* in Infl. is the vP.

In the interpretation of the sentences in (23), *tamid* must quantify over events. I assume that in general, when *always* quantifies over event, there can be two distinct event variables, one introduced in the restriction and one in the nuclear scope. Following Rothstein 1995, I assume that the two variables must stand in some relation R to one another, and that each must be bound. When the variable in the restriction is bound by the universal quantifier contributed by *tamid,* and there is an additional event variable in the nuclear scope, the variable in the nuclear scope gets bound by a default existential quantifier.

The choice of the restriction is relatively free, and therefore *tamid* in Infl. allows many interpretations. Let us see how this works for (23a: *Ben always fixes the blue car*).

We must first derive the set of events of the *v*P:

Fixes → $\lambda\alpha\lambda\beta[\{e\in FIX: \lambda\theta_1[\alpha]$ (Th) (e) $\wedge \lambda\theta_2[\beta]$ (Ag) (e)$\}]$

V-Fnc$_1$+ the blue car → $\lambda e[\theta_1(e)=\sigma(BLUE\ CAR)]$

fixes the blue car →

$\lambda\alpha\lambda\beta[\{e\in FIX: \lambda\theta_1[\alpha](Th)\ (e) \wedge \lambda\theta_2[\beta]\ (Ag)\ (e)\}]\ (\lambda e[\theta_1(e)=\sigma(BLUE\ CAR)])$

$=\lambda\beta[\{e\in FIX: \lambda\theta_1[\lambda e[\theta_1(e)=\sigma(\ BLUE\ CAR)]](Th)\ (e) \wedge \lambda\theta_2[\beta]\ (Ag)\ (e)\}]$

$=\lambda\beta[\{e\in FIX: Th(e)=\sigma(\ BLUE\ CAR) \wedge \lambda\theta_2[\beta](Ag)\ (e)\}]$

Ben fixes the blue car→

$\lambda\beta[\{e\in FIX: Th(e)=\sigma(\ BLUE\ CAR) \wedge \lambda\theta_2[\beta](Ag)\ (e)\}]\ (\lambda e[\theta_2(e)=b])$

$=\{e\in FIX: Th(e)=\sigma(\ BLUE\ CAR) \wedge \lambda\theta_2[\lambda e[\theta_2(e)=b]](Ag)\ (e)\}$

$=\{e\in FIX: Th(e)=\sigma(\ BLUE\ CAR) \wedge Ag(e)=b\}$

I.e., the set of fixing events whose agent is Ben and whose theme is the blue car

Possible interpretations for (23a):

 (a).

Suppose the restriction is set to events of a day of work at the garage, and the relation between the two event variables is a subset relation, then:

ben always fixes the blue car →

$\forall e(day\ of\ work\ at\ the\ garage(e))\ (\exists e'\ (e'\subseteq e \wedge e'\in FIX\ )\ (Th(e')=\sigma(CAR\wedge BLUE) \wedge$
$$Ag(e')=b)$$

I.e., every day of work in the garage, contains an event of fixing whose agent is Ben and whose theme is the blue car

This reading is not exhaustive (i.e., it does not imply that there are no events of Ben fixing other objects), since a day in the garage could contain other subevents in which Ben fixes a bicycle, or a motorcycle, etc.

(b):

Suppose we set the restriction to events of Ben fixing something and the relation to identity, then:

ben always fixes the blue car $\rightarrow$

$$\forall e\ (e\in FIX \wedge \exists x(Th(e)=x) \wedge Ag(e)=b)$$
$$(\exists e'\ (e'=e \wedge e'\in FIX)\ (Th(e)=\sigma(CAR\wedge BLEW) \wedge Ag(e)=b))$$

I.e., every event of fixing s.t. its agent is Ben and its theme is something is identical to an event of fixing s.t. its agent is Ben and its theme is the blue car

This reading is exhaustive.

Let us turn now to the obligatorily exhaustive (23b).

The syntax of Wijler sentences determines that *always* takes *V-Fnc$_1$+the blue car* as its syntactic argument. Constraint (2) determines that the syntactic argument must always be the nuclear scope. Well, the syntactic argument is translated as follows,

V-Fnc$_1$-the blue car $\rightarrow \lambda e[\theta_1(e)= \sigma(BLUE\ CAR)]$

but this, as it stands, cannot serve as the nuclear scope, because the nuclear scope must be of type t, and the above is of type $<e,t>$. I therefore stipulate the following:

- ◆ When the syntactic argument of *always* denotes a **property of events**, the nuclear scope is derived by applying that property of events to an event variable introduced in the restriction.

This way of deriving the nuclear scope is justified by the fact that the hearer (i) must obviously find a way of turning the type $<e,t>$ denotation of the syntactic argument into a formula; and (ii) is seeking to ensure that the universal quantification over the event(s) introduced in the restriction is non-vacuous, and has something to bind in the nuclear scope.

Thus, before we derive the nuclear scope, let us first derive the restriction. The rest of our example sentence, viz. *Ben fixes*, must go into the restriction (constraint 3). We know that parts of the restriction may also be contextually supplied. Since the restriction must be of type t, we must treat the verb as taking an unspecified object. It is natural to supply as the first argument of the verb this property of events: $\lambda e[\exists x(\theta_1(e)=x)]$ – i.e., the property of having some individual filling the first thematic role.

fixes V-Fnc$_1$-something$\rightarrow$

$\lambda\alpha\lambda\beta[\{e\in FIX: \lambda\theta_1[\alpha] (Th) (e) \wedge \lambda\theta_2[\beta] (Ag) (e)\}] (\lambda e[\exists x(\theta_1(e)=x)])$

$= \lambda\beta[\{e\in FIX: \lambda\theta_1[\lambda e[\exists x(\theta_1(e)=x)]] (Th) (e) \wedge \lambda\theta_2[\beta] (Ag) (e)\}]$

At this point, I would like to make one more assumption: I assume (without specifying the relevant mechanism) that when the value of θ_1 gets filled in as the Theme role, the information that this is the first thematic role is retained. Let us mark this by writing Th_1. So when we do λ-conversion we get this:

$= \lambda\beta[\{e\in FIX: \lambda\theta_1[\lambda e[\exists x(\theta_1(e)=x)]] (Th_1) (e) \wedge \lambda\theta_2[\beta] (Ag) (e)\}]$

$= \lambda\beta[\{e\in FIX: \lambda e[\exists x(Th_1(e)=x)] (e) \wedge \lambda\theta_2[\beta](Ag) (e)\}]$

$= \lambda\beta[\{e\in FIX: \exists x(Th_1(e)=x) \wedge \lambda\theta_2[\beta] (Ag) (e)\}]$

ben fixes something$\rightarrow$

$\lambda\beta[\{e\in FIX: \exists x(Th_1(e)=x) \wedge \lambda\theta_2[\beta] (Ag) (e)\}] (\lambda e[\theta_2(e)=b])$

$= \{e\in FIX: \exists x(Th_1(e)=x) \wedge \lambda\theta_2[\lambda e[\theta_2(e)=b]] (Ag) (e)\}$

$= \{e\in FIX: \exists x(Th_1(e)=x) \wedge Ag(e)=b\}$

We take the universal quantifier introduced by *always* to quantify over the events in the above set, so given the lexical semantics above, we get the following formula:

$\forall e\ (e\in FIX\ (\exists x(Th_1(e)=x) \wedge Ag(e)=b)\ (\lambda e[\theta_1(e)=\sigma(CAR\wedge BLUE)]\ (e)\ )$

$= \forall e\ (e\in FIX: \exists x(Th_1(e)=x) \wedge Ag(e)=b)\ (\theta_1(e)=\sigma(CAR\wedge BLUE))$

But since the Theme role is the first argument, the value of the free theta-role variable in the nuclear scope must be Th_1. So this is equivalent to:

$\forall e\ (e \in FIX:\ \exists x(Th_1(e)=x) \wedge Ag(e)=b)\ (Th_1(e)=\sigma(CAR \wedge BLUE))$

I.e., for every fixing event whose agent is Ben which has some theme (which is in turn the first thematic role of that event): the thematic role of its first argument (which is known to be its theme) is filled in with the blue car.

This captures our intuition about this sentence and it correctly predicts that it is exhaustive (there are no event of Ben fixing any object other than the blue car).

However, there are contexts in which a Wijler sentence with *always* does not have to be exhaustive. Consider the following:

> CONTEXT: Ben is a teacher in a dancing course for teenage kids. Every Friday night he goes with his students to dancing parties where they all dance and he dances with several of them. He dances with Lucy at all these parties. Sara (a fellow student) says to her friend:
>
> (24) ben roked tamid   im   lusi (me'anyen ma ima shela taxshov   al   ze)
>   Ben dances always with Lucy (wonder what mom hers will-think about this)

If (24) were interpreted in the same manner as (23), then its meaning would come out the following (I assume that the PP *with Lucy* denotes the 1st argument of the verb; Prt=partner).

$\forall e\ (e \in DANCE:\ \exists x(Prt_1(e)=x) \wedge Ag(e)=b)\ (Prt_1(e)=l)$

I.e., at every dancing event of which Ben is the agent and the partner is someone, Lucy is the partner

This is an exhaustive reading; it does not allow for events in which Ben dances with any other partner. However, the context in (24) does not allow an exhaustive reading (it specifically mentions events of Ben dancing with other partners), and yet the sentence is felicitous, so something further must be said of the interpretation of *always* in Wijler sentences.

I believe that in order to arrive at the right reading, we should assume that the *partner* in a dancing event may consist of a sum of individuals (think of someone dancing and partners keep replacing one another). Given this assumption, we can say that the nuclear scope determines that Lucy is always **among** the people with whom Ben dances. The interpretation would be as follows,

$\forall e \, (e \in DANCE: \exists x(Prt_1(e)=x) \wedge Ag(e)=b) \, (l \; \text{part-of} \; Prt_1(e))$

I.e., for every dancing event of which the agent is Bill and someone(s) is/are the partner, Lucy is among the individuals constituting its partner.

and that is the non-exhaustive reading that we wanted.

However, one may suggest that we could arrive at a similar reading in a simpler way, if we assumed that the nuclear scope may consist of the whole sentence, in which case it could be a subevent of a distinct event in the restriction (e.g., a party). The result would be as follows:

$\forall e \, (\, e \in PARTY \,) \, (\, \exists e'(e' \subseteq e)(e' \in DANCE: Ag(e')=b \wedge Prt_1(e')=l) \,)$

i.e., every party contains an event of dancing of which Ben is the agent and the partner is Lucy

The problem with such an analysis is that there is evidence that the nuclear scope in Wijler sentences can only contain the property of events denoted by the V-FncP, and consequently, the restriction must contain the rest of the sentence.

Consider the examples in (25).

(25) a kSe lusi boxa, ben tamid roked im axota
     when Lucy cries, Ben always dances with her sister

b #kSe lusi boxa, ben roked tamid im axota
     when Lucy cries, Ben dances always with her sister

(25a) is interpreted with the *when clause* in the restriction (constraint 1), and the nuclear scope is derived from the set of events denoted in the vP by applying existential closure. The relation between the event in the restriction and the one in the nuclear scope is a subset relation. The interpretation of (25a) is as follows.

$\forall e \, (e \in CRY \wedge Ag(e)=l) \, (\exists e' \, (e' \text{ at time of } e \wedge e' \in DANCE) \, (Prt(e)=\textit{lucy's sister}^{41} \wedge$
$$Ag(e)=b))$$

i.e., every crying event whose agent is Lucy has an event overlapping with it in time which is a dancing event whose agent is Ben and whose partner is Lucy's sister.

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[41] For simplification, I skip the derivation of the property denoted in 'Lucy's sister'.

Now suppose we assume that the nuclear scope of the Wijler sentence in (25b) may also contain a proposition derived by applying existential closure to the set of events denoted by the vP. If so, there is nothing to prevent us from assigning (25b) the same meaning as (25a). However, empirically, this interpretation is not available for (25b). Most informants take (25b) to be unacceptable, arguing that the *when clause* is unrelated to *the main clause*. This implies that they failed to have the whole sentence in the nuclear scope, and consequently could not use the when clause in the restriction.

One informant suggested that (25b) is possible, but only on the following interpretation: *Whenever Lucy cries and **Ben dances with someone** that person is always her sister*. This interpretation is represented as follows:

$$\forall e,e' \; (e' \text{ at time of } e \land e \in CRY \land Ag(e)=l \land e' \in DANCE \land \exists x(Prt_1(e')=x) \land Ag(e')=b)$$
$$(Prt_1(e')=lucy's\ sister)$$

i.e., every event of Lucy crying which has an event overlapping with it in time of Ben dancing with a partner is an event in which the partner is Lucy's sister

This interpretation captures the meaning described by my informant, and it is exhaustive (it does not allow for there to be events of Lucy's crying and Ben dancing with a partner in which the partner is not Lucy's sister). On this interpretation the only thing in the nuclear scope is the denotation of the V-FncP, as predicted by constraint (2). The restriction contains the *when clause* in accordance with constraint (1), and all the material of the main clause is included, in accordance with constraint (3). The theory correctly predicts the sentence to be acceptable on this reading.

However, given that there is a way to derive a non-exhaustive reading for Wijler sentences, why is that reading so hard to obtain? Why did we need such an elaborate context in (23)? I believe that the reason for this is that we tend to think of a dancing event as having one individual per each thematic role. The context is required to make salient the alternative in which Ben dances at one event with a sum of individuals.

To sum up, I showed that the proposed theory of Wijler sentences explains:

❖ the exhaustivity of *always* as well as its occasional absence

6.3.5   Restrictions on Distribution: *rak* ('only'), *gam* ('also') and *afilu* ('even')

One of the facts we noted is that *rak* ('only'), *gam* ('also') and *afilu* ('even') cannot associate with an argument of the verb (or a modifier of the VP) when they are in Infl position. Let us look at the case of *rak* ('only').(the cases of *gam* and *afilu* are accounted for in the same way).

Consider the following:

(26) a   ben niSek rak et <u>lusi</u>
          Ben kissed only acc Lucy

     b   #ben rak niSek et <u>lusi</u>
          Ben only kissed acc Lucy

Let us first derive the acceptable (26a).

rak ('only') (repeated from 6.2.7):

Syntax: When in Infl. position, its syntactic argument is the VP.

Semantics: *rak* has two arguments:
      (i) a **skeleton** – i.e., syntactically: an open formula, or a λ-abstract; semantically: the set of values for the free variable which verify the open formula = the set represented by the λ-abstract; and
      (ii) a **filled in value** – i.e., an element which can be combined with the <u>skeleton</u> to produce, syntactically, a closed formula, and semantically, a proposition.
        A rough approximation of the semantics of *rak/only*:

Let T,S be variables ranging over possible denotations of the type of the <u>filled-in value</u>, and let P be a variable ranging over possible denotations of the type of the <u>skeleton</u> (of the λ-abstract). For any T,S,P,
$rak(T,P) = P(T) \wedge \forall S[P(S) \rightarrow S=T]$

Discourse function: *rak/only* comments on an overly strong expectation concerning the
     values which verify the skeleton.
constraint 1: The 'skeleton' and 'filled in value' must always constitute a way of factoring
     out the prejacent (the sentence minus *only*) into two parts (ones which could be
     combined to yield the prejacent again).
constraint 2: The 'filled in value' must be the syntactic argument.

Ben kissed only Lucy:

♦ the prejacent:

kiss Lucy → $\lambda\alpha\lambda\beta[\{e\in KISS: \lambda\theta_1[\alpha](Th) (e) \wedge \lambda\theta_2[\beta](Ag) (e)\}(\lambda e[\theta_1(e)=l])$

$=\lambda\beta[\{e\in KISS: \lambda\theta_1[\lambda e[\theta_1(e)=l]](Th) (e) \wedge \lambda\theta_2[\beta](Ag) (e)\}$

Ben kiss Lucy → $\lambda\beta[\{e\in KISS: \lambda\theta_1[\lambda e[\theta_1(e)=l]](Th) (e) \wedge \lambda\theta_2[\beta](Ag) (e)\}(\lambda e[\theta_2(e)=b])$

$= \{e\in KISS: \lambda\theta_1[\lambda e[\theta_1(e)=l]](Th) (e) \wedge \lambda\theta_2[\lambda e[\theta_2(e)=b](Ag) (e)\}$

E-closure:

$\exists e\in KISS (\lambda\theta_1[\lambda e[\theta_1(e)=l]](Th) (e) \wedge \lambda\theta_2[\lambda e[\theta_2(e)=b](Ag) (e))$

The syntactic argument of *rak* 'only' is V-Fnc$_1$P; hence, constraint 2 determines that the **'filled in value' must be the property of events denoted in V-Fnc$_1$P**.

♦ Factoring out and applying *rak* 'only' to a pair of a 'skeleton' and a 'filled in value':

skeleton: $\lambda\alpha[\exists e\in KISS (\lambda\theta_1[\alpha] (Th) (e) \wedge \lambda\theta_2[\lambda e[\theta_2(e)=b](Agt) (e))]$

filled-in value: $\lambda e[\theta_1(e)=l]$

rak $(\lambda e[\theta_1(e)=l]), \quad \lambda\alpha[\exists e\in KISS (\lambda\theta_1[\alpha](Th) (e) \wedge \lambda\theta_2[\lambda e[\theta_2(e)=b]](Agt) (e))])$

$= \exists e\in KISS (\lambda\theta_1[\lambda e[\theta_1(e)=l]](Th) (e) \wedge \lambda\theta_2[\lambda e[\theta_2(e)=b]](Ag) (e)) \wedge$
$\quad \forall\gamma[\lambda\alpha[\exists e\in KISS (\lambda\theta_1[\alpha](Th) (e) \wedge \lambda\theta_2[\lambda e[\theta_2(e)=b]](Ag) (e))] (\gamma) \rightarrow \gamma=\lambda e[\theta_1(e)=l]]$

After lambda conversions and reductions we get:

$= \exists e\in KISS(Th(e)=l \wedge Ag(e)=b) \wedge$
$\qquad\qquad\qquad \forall\gamma[\exists e\in KISS(\lambda\theta_1[\gamma](Th)(e) \wedge Ag(e)=b) \rightarrow \gamma=\lambda e[\theta_1(e)=l]]$

i.e., There is a kissing event s.t. its agent is Ben and its theme is Lucy; and
for every property of events γ which assigns some value to an event's n[th] thematic role
θ_n[42], if there is a kissing event s.t. its agent is Ben and its 1st thematic role is a Theme
whose value is assigned by γ, then γ assigns the value Lucy to the 1st thematic role.

(Or simply: There is a kissing event whose agent is Ben and whose theme is Lucy, and
every kissing event whose agent is Ben and whose theme is an individual, is an event of
kissing of which the agent is Ben and the theme is Lucy)

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[42] This must hold of γ, since it serves as an argument of a verb, and must therefore satisfy the constraint on
arguments of verbs.

The corresponding Infl. sentence (26b) would be unacceptable because the syntactic argument of the adverb in Infl. is VP, so constraint 2 determines that the 'filled in value' must be the property of events denoted in the VP, i.e.,

$\lambda\beta[\{e\in KISS: \lambda\theta_1[\lambda e[\theta_1(e)=l]](Th)(e) \wedge \lambda\theta_2[\beta](Ag)(e)\}$.

But, the interpretation we were after is one in which the 'filled in value' is:

$\lambda e[\theta_1(e)=l]$, and therefore this reading cannot be obtained from the Infl. sentence.

Crucially, constraint 2 implies that the semantics alone does not account for all cases of what we intuitively perceive as association. For example:

(27)   ben kana rak sefer Sel hemingwey
         Ben bought only a book of Hemingway

The semantics of (27) is as follows[43]:

$\exists e\in BUY (\exists x (BOOK\ OF\ HEMINGWAY(x) \wedge Th(e)=x) \wedge Ag(e)=b) \wedge$
$\forall\gamma[\exists e\in BUY(\lambda\theta_1[\gamma](Th)(e) \wedge Ag(e)=b) \rightarrow$
$\gamma = \lambda e[\exists x(BOOK\ OF\ HEMINGWAY(x) \wedge \theta_1(e)=x)]$

i.e., There is a buying event s.t. its agent is Ben and its theme is a book of Hemingway's; and for every property of events γ which assigns some value to an event's n^{th} thematic role θ_n, if there is a buying event s.t., its agent is Ben and its 1st thematic role is a Theme whose value is assigned by γ, then γ determines that its 1st thematic role is a book. (Or simply: There is a buying event whose agent is Ben and whose theme is book of Hemingway's, and every buying event whose agent is Ben and whose theme is an individual, is an event of buying of which the agent is Ben and the theme is book of Hemingway's)

However, this does not exhaust our knowledge about the domain of quantification for *rak* ('only'); if the context tells us that Ben was buying books we would understand (27) to mean that the only book that Ben bought is a book of Hemingway's. In this case we would intuitively define *Hemingway* as the 'associate'.

In chapter 4, I argued that in this case 'association' arises as a pragmatic inference, and that the semantic argument of *rak* is the property of events associating a book of Hemingway's with the theme. Note that there could be further contextually imposed restrictions on the domain of quantification; for example, if we knew that Ben was buying classics then we would understand the sentence to mean that the only classic book he bought was a book of Hemingway's, and if we knew that he was buying books from

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[43] Leaving out the details of the semantics of the DP *a book of Hemingway*.

the reading list of his English class, then we would understand the sentence to mean that the only book of that list that he bought was a book of Hemingway's. Thus, we independently need to assume pragmatically imposed restrictions on the domain of quantification; I argue that pragmatic association belongs with these restrictions.

6.3.6   Conclusion

In this section I proposed a semantic analysis of the various semantic phenomena associated with the Wijler sentences.

I added the following constraints and stipulations:

♦ I stipulated a constraint on arguments of verbs determining that we cannot take a property of events as the nth argument of a verb unless it **entails that the thematic role associated with the lexical argument of V-fnc$_n$ is filled in with some individual** (be it the value of a constant or of a variable).

♦ I stipulated is that the syntax of Wijler sentences restricts possible interpretations of bekoSi 'barely' as follows: when interpreting bekoSi 'barely'in Wijler sentences, it is impossible to make use of a scale of possible worlds, underlined by an organizing principle, based on **the event depicted in the sentence**.

With these in place, I showed that the proposed theory accounts for the following properties of the Wijler sentences:

(a)   the existential entailment with *negation* and *almost*

(b)   the obligatory but-rather conjunct with an argument of the verb

(c)   the optionality of a but-rather conjunct with optional modifiers of the verb phrase

(d)   the fact that *almost* cannot be interpreted relative to possible worlds

(e)   the fact that *barely* cannot be interpreted relative to possible worlds

(f)   the exhaustivity of *always* as well as its occasional absence

(g)   the unacceptability of *rak* 'only' in Infl. sentences, when associated with an argument of the verb, or with an optional modifier of the verb phrase

Capter 7: The Discourse Aspect of Wijler Sentences

7.1   What We haven't Explained So Far

The syntax-semantics theory presented in the preceding chapter was shown to account for much of the data under consideration. However, there are some properties of Wijler sentences for which it cannot account.

7.1.1   The Facts

We still need to explain the following.

[A]   **Remaining Gaps in Distribution**
Comparing Wijler sentences to the corresponding Infl. sentences with the same associate, we still have unexplained cases where in a given context, the Infl. sentence is perfectly natural, but the Wijler sentence is infelicitous.

The intuitive 'associate' in (1a) below is *an apple*, however, the corresponding (1b) with the same associate is unacceptable.

CONTEXT: Ziva saw Ben eating an apple, but his mother who was not there thinks that he ate some candy instead, and she is upset about it.

(1) a   Ziva: lama at   do'eget, hu davka   axal <u>tapuax</u>
              Why you worried? He DAVKA ate apple

     b   #Ziva: lama at   do'eget, hu axal davka <u>tapuax</u>
              Why you worried? He ate DAVKA apple

Gaps in distribution also show up with negation. Consider:

(2) A: eyfo   ben rac   axSav?
         where Ben run(ing) now

     B: ben lo   rac   <u>bamaslul</u>
         Ben not run(ing) on-the-track

     C: ben rac   lo <u>bamaslul</u>
         Ben run(ing) not <u>on-the-track</u>

(3) A: eyfo   ben rac   axSav
         where Ben run(ing) now?

     B: ben lo   rac   <u>ba-gina</u>
         Ben not run(ing) in-the-garden

     C: ??ben rac   lo <u>ba-gina</u>
           Ben run(ing) not <u>in-the-garden</u>

The intuitive 'associate' in (2B) and (2C) is *on the track*; it is natural to have both negation and *on-the-track* accented in that context, and both Infl sentence and Wijler sentence are felicitous as responses to A's question. (3) is analogous to (2) regarding context, associate and intonation, and yet while the Infl. sentence (3B) is felicitous, the corresponding Wijler sentence (3C) is infelicitous.

[B]   **The Inference about Conflicting Expectations**

Wijler sentences invariably imply that the reported state of affairs was expected to be different. In the case of the corresponding Infl. sentence with the same associate, such an implication is either completely absent or cancelable.[44]

Examples:

(4)   a   Salom axSav meyaceget bekoSi et <u>acma</u>
          Peace Now   represents barely acc itself

Inference: Peace Now was expected to represent more than just itself

b   Salom axSav bekoSi meyaceget et <u>acma</u>
          Peace Now   barely represents acc itself

No inference of conflicting expectations.

(*There is a different inference*: Peace Now would not succeed in representing anybody other than itself.)

(5)   a   sara higi'a kim'at <u>bazman</u>
          Sara arrived almost on-the-time
          (Sara arrived almost on time)

(5a) gives rise two interpretations, each of which giving rise to an inference of a different conflicting expectation:

Inference₁: Sara was expected to arrive later (later than 'on-the-time') (this reading is biased by a nuclear accent on the PP *on-the-time*)

Inference₂: Sara was expected to arrive exactly 'on-the-time' (this reading is biased by a nuclear accent on *almost*).

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[44] Infl. sentences with *davka* do have a similar implication, but see [C] below.

b   bsara kim'at higi'a <u>bazman</u>
Sara almost arrived on-the-time
(Sara almost arrived on time)

No inference of conflicting expectations.

(6) a   ben roked tamid im lusi
Ben dances always with Lucy

Inference: it is expected that there would be occasions on which
               Ben dances with other partners

b   ben tamid roked im <u>lusi</u>
Ben always dances with Lucy

No inference of conflicting expectations.

[C]   **Epistemic and Deontic Expectations**

The inference associated with Wijler sentences may involve either an
epistemic expectation (an expectation about what is the case) or a **deontic**
expectation (a view about what is proper, what ought to be the case).
When the expectation is a deontic one, Wijler sentences have the effect of
an accusation.

Interestingly, the deontic option distinguishes the inference associated
with Wijler sentences from the somewhat similar inference lexically
associated with the adverb *davka*. Infl. sentences containing *davka* have an
uncancelable implication that the reported state of affairs was assumed to
be different, but here the implication invariably involves **epistemic**
modality (never deontic modality).

Examples of inferences of deontic expectations:

(7) a   ben hexna et ha'oto   davka   al maavar-haxacaya
Ben parked acc the-car DAVKA on the-pedestrian-crossing

Accusation inference: the speaker considers it wrong of Ben to
                            have parked where he did

b   ben davka   hexna et ha'oto al maavar-haxacaya
Ben DAVKA parked acc the-car on the–pedestrian-crossing

Incompatible with the above inference

(8) a   ha'iSa   xacta   et hakviS lo bemaavar-haxacaya
the-woman crossed acc the-road not at-the–pedestrian-crossing

Accusation Inference: the speaker considers it wrong of the
                              woman to have crossed where she did

b   ha'iSa lo xacta bemaavar haxacaya
the-woman not crossed at the pedestrian crossing

No accusation inference.

[D]   **The "Queer" Reading with *bekoSi* ('barely')**

Wijler sentences with *bekoSi*, which are never acceptable on a
straightforward compositionally derived interpretation, exhibit instead an
unusual reading which cannot be derived compositionally.

For instance, consider (9).

(9)   ziva hivtixa   li   mixtav aval basof   hi Salxa li   bekoSi pitkit
Ziva promised me a letter   but in-the-end she sent me barely small-note
(*pitkit* is a diminutive form of *pitka* or *petek* ('a note'))

My intuition is that (9) means that what Ziva wrote was a (small) **note** relative to any

standard, but that as **a letter** what she wrote was lame. This is queer, because it seems

that *bekoSi* ('barely') comments not on the claim that the individual filling in the thematic

role associated with the lexical argument of V-Fnc$_1$ in the event (the theme in the above

case) is a (small) **note**, but rather on the claim that the individual filling in the thematic

role associated with the lexical argument of V-Fnc$_1$ in the event is a **letter of sorts**.

7.1.2   The Syntax and Semantics are not Enough

Let us see what happens if we try to derive the facts above based on the syntax and

semantics proposed in chapter 6.

We start with the gap in the distribution of *davka*, illustrated in (1), repeated below.

CONTEXT: Ziva saw Ben eating an apple, but his mother who was not there
thinks that he ate some candy instead, and she is upset about it.

(1)   a   Ziva: lama at   do'eget, hu davka   axal <u>tapuax</u>
Why you worried? He DAVKA ate apple

b   #Ziva: lama at   do'eget, hu axal davka <u>tapuax</u>

Why you worried? He ate DAVKA apple

First, here are some preliminaries and assumptions about *davka*:

Lexical Properties of davka - Preliminaries.

There are two lexical manifestations of *davka*, which are closely related. Consider the following:

(10) ben davka   niSek et <u>sara</u>
     Ben DAVKA kissed acc Sara

(10) has two readings, one in which Ben kissed Sara and this countered someone's belief in some sense, and another in which Ben kissed Sara, and he did it to spite. The second reading requires heavy emphasis on the first syllable of the adverb, and it never shows up in Wijler sentences. I restrict the discussion here to *davka* on the first interpretation call it $davka_a$[45].

Lexical information about *davka*_a ('contra belief ') (repeated from chapter 6):
(inspired by Eilam 2007)

Syntax: When in Infl. position, its syntactic argument is the IP.
Semantics: $davka_a$ applies to a single argument of type t.
     Let p be a variable of type t. For any p, $davka_a(p) = p \wedge$ exists belief that $\neg p$

We may also allow $davka_a$ to apply to arguments of type <e,t>, as follows.
     Let Y be a variable of type <e,t>.

     $davka_a(Y) = \lambda e [Y(e) \wedge$ exists contextually salient belief that $\neg Y(e)]$,

constraint: The semantic argument is always the syntactic argument

The interpretation of the Infl. sentence in (1a) is derived as follows.

***Ben davka*_a *ate an apple*:**
The syntactic argument of *davka* is IP, and the semantic argument is the proposition denoted by it.

$eat \rightarrow \lambda\alpha\lambda\beta[\{e \in EAT: \lambda\theta_1[\alpha](Th)(e) \wedge \lambda\theta_2[\beta](Ag)(e)\}]$

$V\text{-}Fnc_2 + ben \rightarrow \lambda e[\theta_2(e)=b]$

---

[45] Personally I believe that the two are closely related and perhaps derived from one meaning, but I avoid this issue here.

An apple $\rightarrow \lambda P[\exists z \in APPLE\ (P(z))]$

V-Fnc₁ $\rightarrow \lambda d[\lambda e[\theta_1(e)=d]]$ type <d, pow(e)>

Lift *V-Fnc₁* to type <T,pow(e)>:

$\lambda T[\lambda e[\ T\ (\ \lambda x[\theta_1(e)=x\ )]]$

V-Fnc₁+an apple $\rightarrow$

$\lambda T[\lambda e[\ T\ (\ \lambda x[\theta_1(e)=x\ )]]\ (\lambda P[\ \exists z \in APPLE\ (P(z))])]$

$=\lambda e[\lambda P[\ \exists z \in APPLE\ (P(z))]\ (\ \lambda x[\theta_1(e)=x])]$

$=\lambda e[\ \exists z \in APPLE\ (\lambda x[\theta_1(e)=x]\ (z))]$

$=\lambda e[\exists z \in APPLE\ (\theta_1(e)=z)]$

eat an apple $\rightarrow$

$\lambda \alpha \lambda \beta[\{e \in EAT:\ \lambda \theta_1[\alpha](Th)(e) \wedge \lambda \theta_2[\beta](Ag)(e)\}]\ (\lambda e[\exists z \in APPLE\ (\theta_1(e)=z)])$

$=\lambda \beta[\{e \in EAT:\ \lambda \theta_1[\lambda e[\exists z \in APPLE\ (\theta_1(e)=z)]](Th)(e) \wedge \lambda \theta_2[\beta](Ag)(e)\}]$

$=\lambda \beta[\{e \in EAT:\ \exists z \in APPLE\ (Th(e)=z) \wedge \lambda \theta_2[\beta](Ag)(e)\}]$

ben ate an apple $\rightarrow$

$\lambda \beta[\{e \in EAT:\ \exists z \in APPLE\ (Th(e)=z) \wedge \lambda \theta_2[\beta](Ag)(e)\}]\ (\lambda e[\theta_2(e)=b])$

$=\{e \in EAT:\ \exists z \in APPLE\ (Th(e)=z) \wedge \lambda \theta_2[\lambda e[\theta_2(e)=b]](Ag)(e)\}$

$=\{e \in EAT:\ \exists z \in APPLE\ (Th(e)=z) \wedge Ag(e)=b\}$

E-closure:

$\exists e \in EAT\ (\exists z \in APPLE\ (Th(e)=z) \wedge Ag(e)=b)$

i.e., there is an event of eating s.t. its agent is Ben and its theme is an apple

davkaₐ (ben ate an apple) $\rightarrow$

$\exists e \in EAT\ (\exists x \in APPLE\ (Th(e)=x) \wedge Ag(e)=b) \wedge$ exists contextually salient belief that

$\qquad\qquad \neg\ \exists e \in EAT\ (\exists x \in APPLE\ (Th(e)=x) \wedge Ag(e)=b)$

i.e., there is an event of eating s.t. its agent is Ben and its theme is an apple, and there is a contextually salient belief according to which it is not the case that Ben ate an apple

Pragmatic association with *an apple*: In the given context, the interlocutors presuppose

that Ben ate something, so the erred belief introduced by the meaning of *davkaₐ* could not

refer to Ben's eating something, or to the fact that it was Ben who ate, etc. The hearer deduces that what makes the existing belief false is that what Ben ate was an apple.

Now look at the semantic derivation of the unacceptable (1b).

ben ate davka$_a$ an apple: davka$_a$ takes V-Fnc$_1$P as its syntactic argument, and hence as its semantic argument.

As before: *V-Fnc$_1$+an apple* $\rightarrow \lambda e[\exists x \in APPLE\ (\theta_1(e)=x)]$

davka$_a$ V-Fnc$_1$+an apple $\rightarrow$

davka$_a$ $(\ \lambda e[\exists x \in APPLE\ (\theta_1(e)=x)]\ )$

$= \lambda e'\ [\lambda e[\exists x \in APPLE\ (\theta_1(e)=x)]\ (e') \wedge$ exists contextually salient belief that
$$\neg\ \lambda e[\exists x \in APPLE\ (\theta_1(e)=x)\ (e')]$$

$= \lambda e'[\exists x \in APPLE\ (\theta_1(e')=x) \wedge$ exists contextually salient belief that
$$\neg \exists x \in APPLE\ (\theta_1(e')=x)]$$

ate davka$_a$ an apple $\rightarrow$

$\lambda \alpha \lambda \beta[\{e \in EAT: \lambda \theta_1[\alpha]\ (Th)(e) \wedge \lambda \theta_2[\beta](Ag)(e)\}]$
$(davka_a\ (\lambda e'[\exists x \in APPLE\ (\theta_1(e')=x)]))$

$= \lambda \beta[\{e \in EAT: \lambda \theta_1[davka_a\ (\lambda e'[\exists x \in APPLE\ (\theta_1(e')=x)])]\ (Th)(e) \wedge \lambda \theta_2[\beta](Ag)(e)\}]$

$= \lambda \beta[\{e \in EAT: davka_a\ (\exists x \in APPLE\ (Th(e)=x)) \wedge \lambda \theta_2[\beta](Ag)(e)\}]$

ben ate davka$_a$ an apple $\rightarrow$

$\lambda \beta[\{e \in EAT: davka_a\ (\exists x \in APPLE\ (Th(e)=x)) \wedge \lambda \theta_2[\beta](Ag)(e)\}]\ (\lambda e[\theta_2(e)=b])$

$= \{e \in EAT: davka_a\ (\exists x \in APPLE\ (Th(e)=x)) \wedge \lambda \theta_2[\lambda e[\theta_2(e)=b]](Ag)(e)\}$

$= \{e \in EAT: davka_a\ (\exists x \in APPLE\ (Th(e)=x)) \wedge Ag\ (e)=b\}$

E-closure:

$\exists e \in EAT\ (davka_a\ (\exists x \in APPLE\ (Th(e)=x)) \wedge Ag\ (e)=b)$

$= \exists e \in EAT\ (\exists x \in APPLE\ (Th(e)=x) \wedge$ exists contextually salient belief that
$$\neg \exists x \in APPLE\ (Th(e)=x) \wedge Ag(e)=b)$$

i.e., there is an eating event s.t., its agent is Ben and its theme is an apple and there is a contextually salient belief that its theme is not an apple

This interpretation is perfectly compatible with the provided context, and therefore we must conclude that the problem with (1b) lies elsewhere.

Let us now turn to the gap in distribution found with negation. Consider the semantics of the degraded (3C): *Ben run(ing) not in the garden*.

We assume:

Lexical properties of lo ('not') (repeated from chapter 6):
Syntax: When in Infl. position, its syntactic argument is the IP.
Semantics: *lo* applies to a single argument, of type t
  Let p be a variable of type t. For any p, $lo(p) = \neg[p]$

  We may also allow *lo* to apply to event properties of type <e,t>, as follows.
  Let Y be a variable of type <e,t>.$lo(Y) = \lambda e[no\ [Y(e)]]$.

constraint: The semantic argument is always the syntactic argument.

lo 'not' in (3C) takes the V-FncP of which the lexical argument is *in the garden* as its syntactic argument, and consequently, it takes the **property of events** stating that the location of the event is the garden as its semantic argument.

$not(\text{V-Fnc}+in\ the\ garden) \rightarrow \lambda e'[\neg\ \lambda e[Loc(e)=\sigma(GARDEN)](e')]]$

$= \lambda e'[\neg Loc(e')=\sigma(GARDEN)]$

Recall that V-FncPs modifying the VP take the VP as their argument. The VP in (3C) is interpreted as follows:

$\lambda\beta[\{e\in RUN: \lambda\theta_1[\beta](Ag)(e)\}]$

In order for the V-FncP *not in the garden* to take this as its argument, it must be lifted from type <e,t> to type <<<e,t>,pow(e)>, <<e,t>,pow(e)>>

Lifting the V-FncP *not in the garden*:

$\lambda VP\lambda\beta[\{e\in E: \lambda e'\ [\neg Loc(e')=\sigma(GARDEN)]\ (e) \wedge e\in VP(\beta)\}]$

$=\lambda VP\lambda\beta[\{e\in E: \neg Loc(e)=\sigma(GARDEN) \wedge e\in VP(\beta)\}]$

run not in-the-garden $\rightarrow$

$\lambda VP\lambda\beta[\{e\in E: \neg Loc(e)=\sigma(GARDEN) \wedge e\in VP(\beta)\}]$
$(\lambda\beta[\{e\in RUN: \lambda\theta_1[\beta](Ag)(e)\}])$

$=\lambda\beta[\{e\in E: \neg Loc(e)=\sigma(GARDEN) \wedge e\in \lambda\beta[\{e\in RUN: \lambda\theta_1[\beta](Ag)(e)\}]\ (\beta)\}]$

After conversions and reductions we arrive at:

$\lambda\beta[\{e\in RUN: \lambda\theta_1[\beta](Ag)(e) \wedge \neg Loc(e)=\sigma(GARDEN)\}]$

ben run not in-the-garden $\rightarrow$

$\lambda\beta[\{e\in RUN: \lambda\theta_1[\beta](Ag)(e) \wedge \neg Loc(e)=\sigma(GARDEN) \}](\lambda e[\theta_1(e)=b])$

$=\{e\in RUN: \lambda\theta_1[\lambda e[\theta_1(e)=b]](Ag)(e) \wedge \neg Loc(e)=\sigma(GARDEN)\}$

$=\{e\in RUN: Ag(e)=b \wedge \neg Loc(e)=\sigma(GARDEN)\}$

E-closure:

$\exists e\in RUN \left(Ag(e)=b \wedge \neg Loc(e)=\sigma(GARDEN)\right)$

i.e., there is a running event s.t. its agent is Ben and its location is not the garden.

There is no problem with the semantics, and in fact if there were a problem we would be in trouble, since we would equally rule out the acceptable (2C): *Ben run(ing) not in-the-track*. The unacceptability of (3C) remains unexplained.

Let us turn now to the inference that the reported state of affairs was expected to be different. This inference is a very prominent characteristic of Wijler sentences, which is not explained by the syntactic and semantic analyses of these sentences. Consider for example (6a): *Ben dances always with Lucy*. This sentence is interpreted as follows.

$\forall e\left(e\in DANCE: \exists x\left(Prt_1 (e)=x\right) \wedge Ag(e)=b\right) \left(Prt_1(e)=l\right)$

I.e., every dancing event s.t. Ben is its agent and its partner is someone, Lucy is its partner

This analysis captures the meaning of the sentence, but there is nothing in it to explain why we get the inference of a conflicting expectation. Similarly, our semantics also has nothing to say about the 'accusation' inferences. Consider for example the semantics of (7a): *Ben parked the car DAVKA on the pedestrian crossing*:

$\exists e\in PARK \left(Ag(e)=b \wedge Th(e)=\sigma(CAR) \wedge Loc(e)=\sigma(PC) \wedge \text{exists contextually salient} \right.$
$$\left. \text{belief} \neg Loc(e)=\sigma(PC)\right)$$

i.e., there is a parking event s.t. its agent is Ben and its theme is the car and its location is the pedestrian crossing and someone believes that its location is not the pedestrian crossing

There is nothing in this semantics to explain the accusation inference.

Finally let us turn to the case of *bekoSi* ('barely'). Consider the following contrast, repeated from chapter 6):

(11) a   ben bekoSi diber im lusi
          Ben barely talked with Lucy

      b   #ben diber bekoSi im lusi
            Ben talked barely with Lucy

I showed in chapter 6 that sentences like (11b) could not be derived compositionally.[46] Our theory of the syntax and semantics determines that the semantic argument of *bekoSi* in (11b) is the property of events stating that the 1st themanitc role of the event (in (11b), that would end up being the theme) is filled by Lucy. But in order to interpret *bekoSi*, we need to identify an index (a standard of evaluation or a possible world) relative to which that property holds of some event, and a minimally different index (a minimally different possible world, or a minimally stricter standard of evaluation) relative to which the property does not hold of the same event. That is impossible for (11b) because:

(i)   **we cannot make use of possible worlds**:

       1.   we need an organizing principle for identifying one world relative to which the **theme is Lucy**, and another relative to which **the theme is not Lucy**. Due to a restriction imposed by the syntax, we cannot use an organizing principle based on the event depicted in the sentence (e.g., we cannot use possible worlds ordered according to how probable it is for Ben to talk to different girls)

       2.   there is no organizing principle that suggests itself based on the proposition derived form the denotation of the V-FncP, i.e., the claim that the theme of the event is Lucy.

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[46] I compress here a detailed argument presented in section 6.3.3.

(ii) **we cannot make use of standards of evaluation** because if the theme of the event is Lucy relative to one standard, then it is the theme relative to any standard.

This is a good result, since it accounts for the unacceptability of (10b).

However, there is a problem. The same argument also applies, for instance, to (9): *Ziva promised me a letter but in the end she sent me barely a small-note*. There is no organizing principle for possible worlds based on the property of events stating that the theme is a small note, and if the theme of an event is a note relative to one standard, then it is a note relative to any standard. So our syntax and semantics actually seem to predict that no Wijler sentence with *bekoSi* should ever be acceptable at all…

Indeed, (9) is acceptable only on the queer interpretation noted above (what she sent me was a lame letter), which cannot be derived compositionally. We still have to explain how that interpretation comes about.

To conclude, the syntax and semantics I proposed cannot account for some gaps in the distribution, for the inference of a conflicting (epistemic or deontic) expectation, and for how the non-compositional interpretation of Wijler sentences with *bekoSi* comes about.

7.2 The Discourse Function of Wijler Sentences

7.2.1 The Proposal

I would like to propose that Wijler sentences have a certain discourse function conventionally associated with them: their function is to present a state of affairs which is incompatible with an expectation of the speaker, thus revealing the speaker's point of view regarding the reported state of affairs. More specifically, I propose that the part of the sentence, which is incompatible with the expectation of the speaker must be what the adverb says of the property of events denoted by the V-FncP.

- ◆ <u>The discourse function of Wijler sentences:</u>

    Wijler sentences conventionally implicate the following:
    What the adverb says about the property of events contributed by the
    argument V-FncP is incompatible with some expectation of the speaker
    (possibly one temporarily adopted by the speaker) concerning what the
    adverb says of that property of events.

Let us look at some straightforward empirical support for this proposal:

7.2.1.1 *tamid* ('always')

Consider (6a): *Ben dances always with Lucy*. The sentence induces an inference
that there is an expectation that there be events where Ben dances with a partner other
than Lucy. With what does this expectation conflict? It conflicts with what the adverb
says of the property denoted by V-Fnc$_1$P, viz., the property an event has if its partner is
Lucy. The adverb says that that property holds of all the events quantified over (those
introduced in the restriction). In other words, it says that in all the events introduced in
the restriction, **the partner is Lucy**. It is this claim which conflicts with an existing
expectation.

7.2.1.2 *kim'at* ('almost')

Consider (5a): *Sara arrived almost on time*. This sentence has two distinct
interpretations, each of which inducing an inference, of a distinct conflicting expectation:
one reading induces an inference of an expectation that **Sara would arrive much later
than she did** (e.g., in a context in which Sara's employer wants to fire her for being late,
and I use (5a) to imply that it was almost impossible for her to get there as early as she
did, and she should not be fired); the second reading induces an inference of an
expectation that **Sara would arrive exactly on time** (in the same context, Sara's
employer's could answer me with (5a) implying that she should be punished because she
failed to arrive exactly on time). According to my proposal, the expectation is supposed
to be in conflict with what the adverb says of the modified V-FncP. In this case the V-

FncP denotes the property of an event if its time is 'on time'. Now, what does *kim′at* say of that property? It says that the time of the event (in the case of (5a): Sara's arrival) that

(a) it was not 'on the time', and

(b) relative to a minimally more lenient standard it was 'on the time'[47]

Our expectation can either stand in conflict with (a), in which case it would be for her arrival on time (the time of the event is expected to **be** 'on time'), or it can stand in conflict with (b), in which case the expectation would be for sara to arrive on a time which is not 'the time' even relative to a more lenient standard, i.e., much later than *almost* 'on-the-time'. Thus, the discourse function stated above accounts for the fact that Wijler sentences with *kim′at* 'almost' induce an inference of a conflicting expectation (as all Wijler sentences do), and for the two possible expectations inferable with *kim′at* 'almost'.

7.2.1.3 – Negation

Let us begin with the contrast presented in (2) and (3), repeated below.

(2) A: eyfo   ben rac   axSav?
        where Ben run(ing) now

     B: ben lo rac____ bamaslul
        Ben not run(ing) on-the-track

     C: ben rac   lo bamaslul
        Ben run(ing) not on-the-track

(3) A: eyfo   ben rac   axSav?
        where Ben run(ing) now

     B: ben lo rac   ba-gina
        Ben not run(ing) in-the-garden

     C: ??ben rac   lo ba-gina
          Ben run(ing) not in-the-garden

---

[47] See chapter 6.3.2.2 for why we could not use possible worlds in which she did or did not arrive on time.

The intriguing contrast is between the acceptable (2C) and the degraded (3C). Why should this distinction arise? Let us see what the conflicting expectation could be for (2C). I proposed that the conflicting expectation concerns what the adverb says about the property denoted in the V-FncP. In the present case, the adverb says that the location of the event is distinct from the location denoted by the V-FncP *on the track*, so we need an expectation for Ben to run *on-the-track*. Well, since runners are normally expected to run on the track, it is easy to accommodate a context for (2C) in which Ben is (deonticaly or epistemically) expected to run on the track, and we correctly predict the sentence to be felicitous. (3C) requires more effort, because there is no naturally arising motivation to assume that 'the garden' is the location where Ben ought to be running (licensing a deontic expectation), or that it is the location where he normally runs (licensing an epistemic expectation), and hence its degraded status.

My prediction is that if the addressees can accommodate a context in which Ben is specifically expected to run *in the garden* the sentence would become acceptable. This prediction is born out. For example: suppose that Ben is the neighbor's dog and every day he goes out running in the garden. Of course, I keep on complaining to my neighbors about him ruining the garden, but to no avail. One morning I go out and lo and behold, Ben is running in the parking lot. I can felicitously say the following:

(12)　　wow!　ben rac　　　lo ba-gina, sof sof
　　　　Wow! Ben run(ning) not in-the-garden, at last

To conclude, the proposed theory accounts for:

- ♦ The observed inferences of conflicting expectations
- ♦ The gaps in the distribution of negation

My proposal as stated above gives rise to two issues that may be debated:

(a)　　**Expectation** – what is an *expectation*, do we need *expectation*, or perhaps we could state the discourse function in terms of *belief /supposition* or otherwise.

(b) **An expectation of the speaker** – Does the
discourse function really require the speaker's
point of view, or perhaps it could be any
expectation salient in the discourse.

These issues will be discussed in the coming sections.

7.2.2   Expectation vs. Belief

7.2.2.1   Empirical Observations

Am I right in stating that the Discourse function of Wijler sentences involves an
expectation? An alternative that comes to mind is that it involves a rejection of a salient
belief. Intuitively, the difference between *expectation* and *belief* is that a *belief* reflects
what the believer takes to be **the case in the actual world**, and an *expectation* reflects
what the expectant takes **as more probable or more proper, relative to similar
alternatives**.

Let us consider (8a) repeated below:

(8a) ha-'iSa   xacta   et ha-kviS lo bemaavar-haxacaya
      the-woman crossed acc the-street not at-the-pedestrian-crossing

At the time of speech, the speaker could not be said to believe that the woman crossed on
the pedestrian crossing because she knows for fact that that was not the case. Perhaps she
held a former belief conflicting with her current statement? Well, unless she assumes that
her former belief is still held by other interlocutors, there is no pragmatic motivation for
her to signal that she contradicts her own former belief. If she did respond to a conflicting
belief it would have to be a belief held by other interlocutors. The context of (8a) is a
news report. There is no pragmatic motivation for a reporter to assume that her
interlocutors held any belief about the reported event. I therefore conclude that (8a) could
not be a response to a conflicting belief. How about an expectation? Our intuitions tell us
that the speaker thought that it was 'wrong' of the woman to cross where she did. In other
words, she considered it more proper for the woman to cross at the pedestrian crossing,

than her crossing at any other location. But this means that she deonticaly **expected** the woman to cross at the pedestrian crossing. Consider (4a) repeated below:

> (4a) a   Salom axSav meyaceget bekoSi et acma
>   Peace Now represents barely acc itself

Intuitively we understand the sentence to mean that based on her knowledge that Peace Now is a political movement the speaker considers it more probable or more 'proper' that Peace Now should represent people other than itself (its own leaders). In other words, she expects Peace Now to represent people other than itself. (4a) could be used to counter an epistemic expectation: based on her knowledge that Peace Now is a political movement the speaker formerly expected that it would represent people other than itself, or a deontic expectation based on the speaker's assumption that a political movement ought to represent more than just itself.

Consider another example (nuclear accent is marked in boldface):

> (12) A: Samati   Se ben ve lusi   mitgarSim
>   heard-1st-sg-past that Ben and Lucy get-a-divorce
>
> B: lo-yaxol-liyot, hem **hitxatnu** rak lifne-xodSaim, lo
>   Impossible,   they married only two-months-ago, no ('didn't they')?

We intuitively understand (12B) to imply that it is wrong of people to get a divorce after being married such a short time. We could say that in the state of affairs of them getting a divorce, speaker B considers it **more proper for them to have been married a time longer than two months before getting a divorce,** i.e., she deonticaly expects tem to have been married longer than two month before getting a divorce.

One interesting distinction between beliefs and expectations is that beliefs are always epistemic, i.e., grounded in what is taken to be the case in the actual world, whereas expectations may be epistemic (in which case they are grounded in what is taken to be 'probable'), but may also be deontic (grounded in what is taken to be 'proper', or 'as it ought to be').

Consider the examples in (13).

(13) a   ben af   paam lo me'axer,   ani maamina Se hu yagi'a   bazman
            Ben any time not late-3rd-sg   I   believe   that he will-arrive on –time
            (Ben is never late, I belive he wll arrive on time)

       b   ben tamid   me'axer,   aval ani maamina Se hu yagi'a   bazman
            Ben always late-3rd-sg, but   I   believe   that he will-arrive on –time

(13a) is a coherent sequence; the speaker's reported belief is founded on her knowledge of Ben's habits, reported in the first clause; we feel that she is justified in holding her belief. (13b) requires more effort, because the first clause establishes Ben's tendency to be late, and so the belief in the second clause may not be founded based on that information. Of course we can easily accommodate a context in which this sequence is coherent. If, for example, I know that Ben is getting married tomorrow, and that he went to sleep in the church to ensure that he would not be late this time, then I can felicitously utter the sequence in (13b), because this context provides sound **epistemic information** justifying my belief. One may believe something to be proper, as in (14) below:

(14)   ani maamina Se ra'uy Se ben yagi'a bazman
           I believe that it is proper that ben will arrive on time

But, crucially the belief is that **it is true in the actual world** that 'it is proper for Ben to arrive on time'.

      An expectation, in contrast, can be founded using either epistemic or deontic bases, as illustrated in (15):

(15) a   ben af paam lo me'axer
            Ben is never late

       b   ben tamid me'axer
            Ben always late-3rd-sg

               …ani mecapa Se (hapaam) hu yagi'a bazman
               I expect that this time he will-arrive on -time
               (I believe   that (this time) he would arrive on time)

The expectation clause is equally coherent following (15a) and (15b). Following (15a) we understand it to mean that I consider it more probable that Ben will arrive on time, than that he will not, and following (15b) we understand that I consider it more proper for Ben to arrive on time, than for him to be late.

Intuitively, the reason for the contrast between (13) and (15) is that a belief means that one is sure of **a state of affairs in the actual world**, and one cannot make use of a deontic basis to make sure that something is actually the case. In contrast, an expectation means that one thinks that (in the future) something should, epistemicaly or deonticaly, occur; i.e., that it is *likely to occur* or *ought to occur*, and both modal bases are compatible with it.

Interestingly, the deontic option distinguishes the inference associated with Wijler sentences from the somewhat similar inference lexically associated with the adverb *davka*. Infl. sentences containing *davka* have an uncancelable implication that the reported state of affairs was assumed to be different, but here the implication invariably involves **epistemic** modality (never deontic modality).

Consider the contrast between (7a) and (7b) repeated below:

(7) a ben davka   hexna et ha'oto al <u>maavar-haxacaya</u>
      Ben DAVKA parked acc the-car on the-pedestrian-crossing

    b ben hexna et ha'oto davka   al <u>maavar haxacaya</u>
      Ben parked acc the car DAVKA on the-pedestrian-crossing

The observation is that (7a) is incompatible with the accusing inference, i.e., we cannot infer from it that the speaker considered it more proper for Ben to park at a location distinct from the pedestrian crossing. Instead it is compatible with any context in which the speaker reacts to someone holding a belief that (in the actual world) Ben parked the car at a different location. For example, suppose that there is a pedestrian crossing just opposite my house. In this context, if someone said: Ben parked the car three blocks away from here, I could reply in: no, he *davka* parked it on the pedestrian crossing. (7b), in contrast, induces an inference of accusation; it implies that the speaker considers it more 'as it ought to be' for Ben to park at a location distinct from the pedestrian crossing.

The hypothesis that Wijler sentences are used to counter an expectation while *davka* in Infl sentences is used to counter an existing belief immediately accounts for the above observations. (7a) is used to counter a belief, and since a belief must be grounded in one's knowledge of the actual world, it cannot be understood as a denial of a

deonticaly founded statement. (7b) is used to counter an expectation, and it is correctly predicted to be compatible with a deonticaly founded expectation.

So far, the evidence seems to entirely support my hypothesis that Wijler sentences are used as a response to a conflicting expectation, and not a conflicting belief. There are some apparent counterexamples to this claim, Consider:

(16) A: kama   tapuxim ben axal, xamiSa lo?
         How-many apples   Ben ate, five,   no?

     B: lo, hu axal rak SloSa
        No, he ate only three

(A) expresses a belief that Ben ate five apples. Intuitively it seems that (B) uses *only* to correct A's erred belief. This is problematic for two elements in my hypothesis. First, (B) responds to a conflicting **belief**, and second she responds to a belief **held by the addressee**. I will address this issue in section 7.2.4.2.

7.2.2.2   Expectations and Beliefs – Formal Definitions

Let me repeat again the intuitive distinction between a *belief* and an *expectation*:

- ❖ A belief reflects what the believer considers to be the case in the actual world
- ❖ An expectation reflects what the expectant believes to be more probable or more proper to become true in the actual world

In order to define the notions of *belief* and *expectation*, I draw upon Heim 1992, where the meaning of *believe* and of *want* is defined in terms of Doxatic accessibility.

Doxatic accessibility means:
A world w' is Doxaticaly accessible for a person x to world w iff w' is compatible with the beliefs of person x in world w.
In other words, the set of worlds Doxaticaly accessible to person x defines what person x believes to be the case about the world of evaluation.

Heim states her formal definition of doxatic accessibility within a general theory of accessibility relations holding between possible worlds, defined as follows:

(17)   Accessibility Relations:

Let $R \subseteq W \times W$. Then f_R is that function from W to pow(W) s.t., for any $w \in W$, $f_R(w) = \{w' \in W : wRw'\}$

Given (17), doxatic accessibility for John, corresponds the following function Dox_j (where Dox stands for doxatic and j for John):

(18)   For any $w \in W$,

$Dox_j(w) = \{w' \in W : w'$ conforms to what John believes in w$\}$

Which boils down to saying that a world is doxaticaly accessible for John to a given world if all propositions in it conform to John's beliefs in that world.

With this in place we can now define what *John believes φ* means:

(19)   *α believes φ* is true in w iff for any φ-world w',

$w' \in Dox_\alpha(w)$

This captures our intuitions about the meaning of *believe*.

Let us now turn to *expect*. In the intuitive statement about *expect* I argued that it denotes a comparison between states of affairs in which the expectation becomes true, which are viewed as more probable or more proper, and similar states of affairs (all else being equal) in which the expectation does not become true, which are perceived as less probable, or less proper. A similar property of *want* has been noted by Heim. According to Heim, *want* denotes a comparison between states of affairs in which the wanted thing is true and similar states of affairs (all else being equal) in which the desired thing is not true, the former being more desirable for the experiencer of 'want' than the latter.

Heim provides a semantics for *want* in terms of the semantics for conditionals; she argues that a sentence like '*Ben wants Mary to come*' actually means that Ben believes

that *if Mary comes* he would be in a more desirable world than *if she doesn't come*. Formally, she states her semantics of *want* as follows:

(20)   '*α wants φ*' is true in w iff

For every w' ∈ Dox$_α$(w):

every φ-world maximally similar to w' is more desirable to α in w than

any non-φ-world maximally similar to w'.

(20) says that '*α wants φ* ' means that worlds in which φ is true are more desirable for α than maximally similar worlds in which φ is not true. (By '**φ-world** maximally similar to **w**', we mean a world in which **φ** is true and which resembles **w** no less than any other world in which **φ** is true).

Now we are ready to provide a semantics for the two kinds of *expect*: the epistemicaly founded *expect*, and the deonticaly founded *expect*.

(21)   '*α epistemicaly expects φ* ' is true in w iff

For every w' ∈ Dox$_α$(w):

every φ-world maximally similar to w' is more **probable** to α in w than

any non-φ-world maximally similar to w'.

In other words, α considers the possibility of a world in which φ is true more probable (to the actual world) than the possibility of a maximally similar world in which φ is not true.

(22)   '*α deonticaly expects φ* ' is true in w iff

For every w' ∈ Dox$_α$(w):

every φ-world maximally similar to w' is more **'proper'** to α in w than

any non-φ-world maximally similar to w'.

In other words, α considers the possibility of a world in which φ is true more as it ought to be (to the actual world) than the possibility of a maximally similar world in which φ is not true.

This concludes my formal definitions for the semantics of *expect* and *believe*.

7.2.3 The Expectation is the Speaker's

7.2.3.1 Empirical support for the idea that the expectation is the speaker's

I argued that the discourse function of Wijler sentences necessarily involves an expectation of the speaker, but one could suggest that it may involve any discourse salient expectation. In this section, I will provide empirical support for the hypothesis that the expectation is the speaker's.

Consider (1a) and (1b), repeated below:

CONTEXT: Ziva saw Ben eating an apple, but his mother who was not there believes that he ate some candy instead, and she is upset about it.

(1) a   Ziva: lama at do'eget, hu davka axal <u>tapuax</u>
        Why are you worried? He DAVKA ate an apple

    b   #Ziva: lama at do'eget, hu axal davka <u>tapuax</u>
        Why are you worried? He ate DAVKA an apple

The context biases a reading in which the intuitive associate in (1a) is *an apple* (I correct her belief that what he ate was an apple), however, the corresponding (1b) with the same associate is unacceptable. I already established that there is nothing semantically wrong with it, so we must assume that it is a pragmatic problem.

Suppose that we wanted to explain this assuming that the discourse function is as stated above, except that instead requiring that there be an expectation of the speaker, we would require a discourse salient expectation,
i.*e., a Wijler sentence is pragmatically used to contradict a discourse salient expectation regarding what the adverb says of the denotation of the modified V-FncP*.
In the case of (1b), this would require a salient expectation that the theme of Ben's eating is not an apple (the existing salient belief that it is an apple is true). The context provided supplies such an expectation: the mother may be said to epistemicaly expect that Ben ate a candy and not an apple; presumably based on her epistemic knowledge of Ben she considers that when presented with the choice it is more normal for him to eat a candy

than is to eat an apple. So the requirement is satisfied. But that means that we would predict that (1b) should be acceptable, contrary to fact.

If however, we assume that the expectation is the speaker's, we get the right prediction. A felicitous use of (1b) requires an expectation that the speaker has. But what could the speaker EXPECT in the above context? Clearly, she could not epistemicaly expect that Ben ate a candy (i.e., that she conceives of Ben's eating a candy more probable to become true in the actual world, than his eating an apple), because she knows for a fact that he ate an apple. This leaves her with the alternative of a deontic expectation. However, there is nothing in the context to support the assumption that the speaker conceives of Ben's eating an apple less 'as it ought to be' than him eating a candy; it is not likely, nor suggested by the context; if anything Ben's mom would be likely to deonticaly expect that he eat an apple. Unless we change our beliefs about 'what is proper for children to eat', there is no basis for a deontic expectation.

Well, perhaps it was a former expectation that she held, based on her acquaintance with Ben (just as the mother did). But why would she want to highlight the conflict between **her formerly held** expectation and the actual state of affairs? All that she would achieve is highlighting Ben's tendencies to choose a candy over an apple, and highlighting this does not serve her purpose to calm the worried mother.

7.2.3.2. Problems for the Idea that The Expectation is the Speaker's

(23) hacarfatim maadifim davka et merkel   lenesi'ut   ha'ixud
      the-French prefer DAVKA acc Merkel for presidency-of the-union
      (Haaretz newspaper 12.5.09)

It is not clear that what licenses (23) a conflicting expectation of the speaker. It is easy to think of a **salient** expectation of the readers of this article. They are liable to expect (epistemicaly) that the French would prefer their own national leader Sarkozy, and not the German leader Merkel, and the same expectation would be formerly held by the speaker. Well, this is similar to what we saw in (1b), however, while (1b) was infelicitous (23) is. In order to resolve this conflict I argue that the speaker may temporarily adopt an expectation (her own former expectation, her addressee's expectation, or any other

expectation suggesting itself). In (23) for example, I believe that the writer temporarily adopts what she considers to be her audience's expectation (as well as her own former expectation). Well, that would technically solve the problem, but we need to make sure that it does not license the unacceptable (1b) as well. Why is it possible for the newspaper writer to adopt the epistemic expectation of the audience, while it is impossible for Ziva to adopt the epistemic expectation of the mother?

I will argue that adopting an expectation (one's own former expectation, or somebody else's expectation) is possible only if two conditions are met:

i.   The adopted expectation is such that the speaker feels that she could have expected that.

- ◆ For example, in (23) the reporter assumes that had she not known the actual facts, she would probably expect (and perhaps did formerly expect) that the French would prefer Sarkozy.

ii.   There has to be a pragmatic motivation for temporarily adopting an expectation.

- ◆ For example in (23) the news reporter uses the Wijler sentence at the beginning of her article. I believe that her purpose in adopting her audience's expectation is to highlight the surprising element about her piece, thus creating motivation for the readers to go on reading.

By contrast, in (1b) there is nothing for Ziva to gain from adopting the mother's expectation, because she wants to calm the mother, so what she wishes to highlight is the 'good' state of affairs (according to the mother) which actually occurred and not that the 'bad' state of affairs (according to the mother) which did not occur.

Another example for the expectation being temporarily adopted by the speaker for pragmatic motivation is presented in the use of *rak* 'only'. Consider the discourse in (24):

(24) A: shamati   sheyesh   lax   arba banot
          heard-1st-sg that-there-is you-Dat four daughters
          (I heard that you have four daughters)

      B$_1$:   lo, yesh li   rak shalosh
           No, there-is I-Dat only three
           (No, I have only three)

      B$_2$:   lo, yesh   li   shalosh
           No, there-is I-Dat three
           (No, I have three)

The hypothesis that the expectation is the speaker's predicts that B$_1$ should be felicitous only if speaker B expected to have more than 3 daughters. She can't have expected this epistemicaly (neither formerly nor now). She could in principle have expected it deonticaly, assuming that she considers it more proper for mothers to have more than three daughters, but it is not very nice for a mother to imply that her children are not enough for her, is it? The hypothesis that the expectation is the speaker's would therefore predict a clear preference for B$_2$ over B$_1$ (allowing B$_1$ just for people for whom having a lot of children is considered a virtue).

The facts, however, are not as clear. There are informants who prefer B$_2$ arguing that B$_1$ implies that the mother is not satisfied with the fact that she has only three daughters. Let me quote a few responses I received from my informants to the discourse in (24):

Nurit and Ran: we would both prefer B$_2$, and we both think that there is a difference between B$_1$ who wants more children and B$_2$ who is happy with what she got.

Yael: B$_2$ is far better, because saying '*only three*' about your daughters expresses disrespect to them.

Orr: B$_2$, unless she thinks that she should have more daughters.

Well these informants seem to follow my prediction. However, there were other informants for whom B$_1$ was preferred, and there was no evidence that they assumed a deontic expectation at all. Instead they said that they preferred B$_1$ because it highlights the correction of A's erred belief. Supposing that we could assume that A epistemically expected B to have four daughters, we would have to say that the Wijler sentence is licensed by A's expectation and not an expectation of the speaker. Thus we have

conflicting evidence. Suppose that we decided to drop the hypothesis that the expectation is the speaker's; we would have no explanation for those speakers who assumed a deontic expectation, when there was a much more reasonable epistemic expectation salient in the context. I therefore argue that the hypothesis is correct and that the conflicting evidence results from a temporary adoption of the addressee's epistemic expectation. Well, clearly the speaker can visualize herself epistemicaly expecting that she had four daughters, if she did not know the true number. But what would motivate this adoption? What does B_1 gain from using the Wijler sentence? The informants who preferred B_1 said that they preferred it because it emphasized the correction of A's mistake. I argue that this is the motivation for B's temporary adoption of A's expectation. This is apparently not a very strong motivation, and we correctly predict variation among speakers.

As in the case of (1b), there are contexts in which adopting a salient expectation is blocked because it is pragmatically unmotivated, and/or the speaker cannot conceive of herself as holding the relevant expectation. Consider the following example.

> (25) CONTEXT: There is a newspaper reporter known for her views that the strong labor unions are abusing their power to get the government to pay them disproportionately large sums of money, leaving the weaker workers with less. This reporter is going to interview one of the leaders of an extremely strong union, who are now on strike. Suppose that this union leader tells her that they are on strike because they make 20,000 IS a month, and they believe that they deserve more. The reporter discussing the strike in her column would never use the following sentence in her report of the interview:
>
> #hem marvixim rak 20,000 IS, ve ledaatam magi'a lahem yoter
> They earn only 20,000 IS, and they think that they deserve more

Why wouldn't she say that? Well, saying that would mean adopting the union's leader's (deontic) expectation for more money than they get. But this expectation is not one that the writer could possibly hold, since she believes that as it is they get far too much. Moreover, she has no pragmatic motivation to adopt this expectation, since if she does she directs her audience to what she considers an unjustified expectation. Thus, as in the case of (1b) the Wijler sentence is not licensed because the speaker has no reason to epistemicaly expect that they earn more, and she has no pragmatic motivation to temporarily adopt the union's deontic expectation.

Let us review another example in which the speaker makes use of a formerly held expectation, for pragmatic reasons. Consider (5a) repeated below:

(5) a sara higi'a kim'at bazman
   Sara arrived almost on-the-time

(5) has two possible interpretations:

First interpretation (biased by nuclear accent on *on-the-time*): Suppose that Sara's teacher says that he is going to punish her because she was late; in this context, Sara's mother could use (5) to convey that in her opinion Sara should not be punished, because she actually arrived very close to the right time. The expectation being contradicted is an epistemic expectation that Sara would get there even later than she did (e.g., we know that Sara lives on the other side of town). This could not have been the speaker's (Sara's mother's) expectation at the time of speech, because she knows that Sara arrived **close** to the time. It is not an expectation of the teacher either. It could have been the mother's former expectation, which she temporarily adopts. Well, since it is her own former expectation, there is no problem for her to think of herself as holding that expectation, but what does she gain pragmatically? The pragmatic gain lies in making the teacher see the reasonable expectation, and understand that it would be wrong of him to punish Sara (i.e., that he should have epistemicaly expected Sara to arrive later than she did, and hence give up his deontic expectation that she should be exactly on time).

Second interpretation: (biased by nuclear accent on *almost*):
The teacher could retort the above claim of the mother, by repeating (5), but this time with the nuclear accent on *almost*: 'yes but she arrived *almost* on time'. In this case the teacher ignores the above epistemic expectation, and he presents a deontic expectation that Sara should arrive exactly on time.
Consider (26).

(26) ben niSek afilu et rina
   Ben kissed even acc Rina

Due to the semantics of *even,* the common ground must contain a belief that Rina is the least probable for Ben to kiss, or that normally Rina is not the person that Ben kisses.

This context makes salient an epistemic expectation that Ben did not kiss Rina. The reason that the speaker can make use of her former expectation is that it highlights the improbability of reported state of affairs. Suppose for example that someone else said that Ben will not kiss Lucy (who is assumed in common ground a little more probable for him to kiss than Rina is). In this context, the speaker would use (26) to highlight the improbability of Ben's kissing Rina, leading to her conclusion if he did kiss Rina, then it is sure that he would not kiss Lucy as well. I think, that in all sentences with *afilu* 'even' the purpose is to highlight the improbability.

Consider the case of *gam* 'also'.

(27)   hatoxna haxofSit tiltela gam et Suk hatelefoniya
        the open source programming shook also acc the market of telephone
        (Web)

In (27) the only available expectation is an epistemic one, assuming that the open source programming could not affect the telephone market. Whose expectation is this? Well it may be the speaker's former expectation, as well as an expectation held by her audience. (27) appeared in a headline a news article in the Web, so it makes sense that the writer of the headline temporarily assumed her audience's expectation, based on a naïve belief that telephones do not involve programming.

I therefore argue that the hypothesis that the expectation is the speaker's is correct, though it allows some margins for the speaker to temporarily adopt an expectation, or use her own former expectation when:

a. it is compatible with the speaker's views of what she could have expected, and
b. temporarily adopting an expectation serves a pragmatic function.

7.2.4   The "Queer" Interpretation of bekoSi ('barely')

Let us see how we obtain an interpretation for (9): *ziva promised me a letter, and she sent me barely a (small) note*, and (4a): *Peace Now represents barely acc itself*.

I repeat my assumptions about the semantics of *bekoSi* (from chapter 6):

Lexical information about bekoSi ('barely'):
Syntax: When in Infl. position, its syntactic argument is the IP.
Semantics (Sevi 1995): *bekoSi* applies to a single argument, of type t
Let φ be a formula and let I be a discrete set and let $<$ be a three place relation s.t. for every $i^* \in I$, $<_{i*}$ is a strict partial order on I ($i_1 <_{i*} i_2$ is read as i_1 is closer to i^* than i_2). $\vartheta bekoSi\varphi 0^{i^*} = 1$ iff $\vartheta\varphi 0^{i^*} = 1$ and there is $i' \in I$, s.t., for any $i'' \in I$, $i' <_{i*} i''$ and $\vartheta\varphi 0^{i''} = 0$

I argue that *bekoSi*can may also apply to expressions of type $<e,t>$, as follows.
For any expression Y of type $<e,t>$,
$\vee bekoshi(Y(e))b^{i^*} = 1$ iff $\vee Y(e)b^{i^*} = 1$ and there is $i' \in I$, s.t., for any $i'' \in I$, $i' <_{i*} i''$ and $\vee Y(e)b^{i'} = 0$

Or, somewhat informally:
$bekoSi(Y)$ = $\lambda e[Y(e) \wedge$ relative to a minimally stricter standard of precision, or a minimally different possible world, (etc.,) $\neg Y(e)]$
constraint: The semantic argument is always the syntactic argument.

Note that the rule does not say that the standard is minimally stricter, a standard $s' \in S$ (closer to s^* than any arbitrary s'') could be either minimally stricter or minimally more lenient, but assuming $\vartheta\varphi 0^{s^*} = 1$, φ cannot be true relative to any s' more lenient than s^*.

Only a minimally stricter standard s' can be such that $\vartheta\varphi 0^{s^*} = 1$ and $\vartheta\varphi 0^{s'} = 0$.

   Consider example (9).

   (9)   ziva hivtixa   li   mixtav aval basof   hi   Salxa li bekoSi pitkit
         Ziva promised me letter but in-the-end she sent me barely small-note
         (*pitkit* is a diminutive form of *pitka* or *petek* ('a note'))

As noted above, my intuition is that (9) means that what Ziva wrote was a (small) **note** relative to any standard, but that as **a letter** what she wrote was lame. This is a bit queer; let us see how we get it.

   There are two elements in this intuitive interpretation that conform to the semantics of *bekoSi* that I assumed:

   (a)   it says of the claim that the individual filling in the thematic
           role associated with the lexical argument of V-Fnc$_1$ in the
           event is a (small) note relative to the accepted standard, (and
           in fact relative to any standard); and,

(b)   it says about the claim that the individual filling in the thematic role associated with the lexical argument of V-Fnc$_1$ in the event is a **letter** that that claim is true of that event relative to some standard, but relative to a minimally stricter standard it is false (i.e., what Ziva sent could be perceived as a letter, but only barely so).

However, there are three properties that do not directly fall under the above semantics:

(i)   The property of which it is said that it holds of the event or does not hold of the event depending on the strictness of the standards is not the same as the one denoted by the lexical argument of the V-Fnc$_1$P modified by *bekoSi*. Instead of commenting on the claim that the theme of the event is **a (small) note**, *bekoSi* comments on the claim that the theme of the event is **a letter of sorts**.

(ii)   The claim that the theme of the event is **a letter of sorts** is said to hold relative to **the most lenient standard** and not relative to the **contextually accepted** standard.

(iii)   Finally, the above interpretation implies that *bekoSi* says three things of its argument, instead of the two expected if we assumed the semantics specified above:

    1. the individual filling in the thematic role associated with the lexical argument of V-Fnc$_1$ in the event **is a (small) note** relative to the **accepted** (and any other) standard;

    2. the individual filling in the thematic role associated with the lexical argument of V-Fnc$_1$ in the event **is a letter** relative to the **most lenient** standard;

3. the individual filling in the thematic role associated with the lexical argument of V-Fnc$_1$ in the event **is not a letter** relative to a standard **minimally stricter than the most lenient** standard.

In order to account for property (i) above, I propose that what prompts us and enables us to switch from '(small) note' to 'letter' is the following. The addressees cannot think of two standards, based on *barely a note* alone (rather than on information about the entire event), s.t. the theme is a note relative to one of them but not relative to the other.

Crucially, the context in which the Wijler sentence is uttered (that is, the preceding clause) contains an **expectation** that the theme of the event of Ziva's writing be filled in with 'a letter'. We can easily perceive of the denotation of *letter* as a 'superproperty' of which the denotation of *note* is a subset. For instance, relative to a particularly lenient standard, the set denoted by *letter* may be taken to contain as members: e-mail messages, notes, and even (small) notes. Crucially, the subset relation between the two properties can be independently established – it is world knowledge that tells us that we may think of a (small) note as *a letter of sorts*, independently of the content of the present sentence. The addressees can make use of the 'superproperty' 'letter', taking it to be that property which holds of the theme of the event according to one standard but not another.

Property (ii) presents no challenge to our semantics (based on Sevi 1995), which requires some index $i^*{\in}I$ (let's call it the evaluation index) relative to which the property holds, and some other index $i'{\in}I$, s.t. i' is closer to i^* than any other index, and the property does not hold relative to i'. Suppose that we interpret *bekoSi* relative to standards of precision; there is nothing forcing us to take s^* to be the **contextually accepted standard**. All that is required is to have a **contextually identifiable standard**, relative to which a stricter standard can be established.

Concerning property (iii), it seems that *bekoSi* Y always entails that Y really holds of the event, relative to a contextually accepted index (the contextually accepted standard, or the actual world), and this claim is independent of the choice of i^*, which may be set to another identifiable

index, and of the fact that in the process of interpreting the sentence we switch from Y to a 'superproperty' of Y.

I would claim that switching from '(small) note' to 'letter' and shifting from the contextually accepted standard (which is accessible at any context, and therefore the most natural choice) to a much more lenient standard are motivated, indeed forced, by the following two facts.

(a)   The property that the theme is a (small) **note** denoted by the argument of *bekoSi* is one that holds relative to all standard or to none: we normally assume that if an object is a (small) note relative to one standard, it is a (small) note relative to any standard. But if so, it cannot possibly be true of the object written by Ziva that it is *bekoSi* a (small) note. If it is *bekoSi* something, it must be *bekoSi* some other property (in our example, **letter**).

(b)   Relative to the contextually accepted standard, what Ziva wrote is in all likelihood not considered a letter at all (or else it would be called *a letter*). But if so, that standard cannot serve as the required evaluation standard relative to which what Ziva wrote was a letter.

We make use of the superproperty 'letter', so that we could claim that relative to some lenient standard *what Ziva wrote was a letter*, but since what Ziva wrote can only be *a letter* relative to a more lenient standard we must set our s^* accordingly. What lenient standard can be contextually identifiable? Well, arbitrary standards s',s"… cannot be identified, but the **most** lenient standard is fixed, so it can be used as s^*. The use of the diminutive *pitkit* (a small note) makes the most lenient standard even more salient.

This switch just described immediately ensures the relation between the **expectation** that the theme be a letter, suggested in the context (the first clause), on the one hand, and the claim made by the adverb *barely* about the property denoted by its V-Fnc_1P argument, viz., the claim that it was *barely* the case that the theme was *a letter* of sorts. The expectation suggested by the first clause is that the theme of the event be a real letter, i.e., a letter relative to the normal contextually accepted standard. This conflicts with what the adverb tells us, because if the theme was barely a letter relative to the most lenient standard, then it was not a letter relative to any other standard.

Crucially, it is that expectation, which highlights the superproperty, and leads the addressees to construct the unusual and non-compositional interpretation of the sentence. The addressees know that an adverb modifying a V-FncP must say something which conficts with an existing expectation. There is a very salient existing expectation in the context, but the only possible interpretation of the Wijler sentence which would make it conflict with that expectation is one where *barely* modifies not the propety an event has if its theme is a note, but the property an event has if its theme is a letter of sorts.

Consider a similar sentence with bekoSi, which is unacceptable.

(28)   ben katav bekoSi mixtav
        Ben wrote barely a-letter

The problem with obtaining the same kind of interpretation as for (9), for (28) is that it is very hard to think of an expectation that the theme of an event be something s.t. a letter **is that thing**, relative to the most lenient standard, and not so relative to any standard stricter than that. We could think of a superproperty 'long letter' containing 'a letter' as member relative to some lenient standard, but 'a letter' could not be a 'long letter' relative to the contextually accepted standard, and it is too close to being a 'long letter' for it to be disqualified relative to any standard above the most lenient standard. Thus, we could not identify our s* as the most lenient standard, or as the contextually accepted standard, implying that there is no contextually identifiable standard that we could use, and the sentence is correctly predicted to be infelicitous.

The same kind of interpretation we saw with (9) is assigned to other Wijler sentences with *bekoSi*, for example (4a): *Peace Now represents barely acc itself*. As in the case of (8), it is clear that the speaker does not wish to say that relative to some strict standard the theme of the event is not 'itself' (presumably the sum of its leaders). Rather the sentence says that what Peace Now represents is *itself* relative to any standard. There is a natural expectation that the theme of representing would be a sum larger than 'itself' (it is assumed to be 'normal' or 'proper' for political movements like Peace Now to represent people other then themselves). The addressees reason that the leaders of *Peace Now* can be viewed as *a public of sorts*, but only relative to the most lenient standard, and

that relative to a minimally stricter standard, representing oneself does not qualify as representing a public. The speaker uses the Wijler sentence highlight the gap between Peace Now and being a legitimate or normal political movement.

7.3   Conclusion

In this chapter I presented a discourse function associated with Wijler sentences. The theory of a discourse function was empirically motivated, to explain Wijler sentences data for which my theory of the syntax and semantics could not account.

I argued that the discourse function of Wijler sentences was to contradict an expectation held (or temporarily adopted) by **the speaker** (thus introducing the speaker's point of view in the sentence), concerning what the adverb says of the property of events denoted in the modified V-FncP. I showed that the proposed theory accounts for the data for which the syntax and semantics do not account. I empirically established that

[A]   What is contradicted is an expectation and not a belief, and

[B]   The contradicted expectation is either the speaker's or
temporarily adopted by the speaker

A **temporary adoption** of an expectation is possible only if:

(i)   The speaker considers it natural for her to hold the expectation (perhaps she formerly did), and

(ii)   There is a pragmatic motivation for temporarily adopting the expectation

I showed that the proposed theory accounts for:

♦   The inference that the described state of affairs was (deonticaly or epistemicaly) expected to be different

♦   the contextually dependent gaps in the distribution of adverbs in Wijler sentences

♦ the "queer" (compositionally impossible) interpretation of *bekoSi* 'barely' in Wijler sentences

Chapter 8: Conclusion

8.1 The Alternation between Wijler Sentences and Infl. Sentences Affects Semantic and Pragmatic Interpretation

The focus of my dissertation is the distribution and interpretation of Wijler sentences. I showed Wijler sentences are distinct from the corresponding Infl. sentences in theis semantic and pragmatic interpretation, and that the distribution of adverbs in Wijler sentences is restricted by its syntactic structure and semantic and pragmatic interpretation.

Consequently, theories deriving superficially similar alternations assuming either syntactic movement of the verb, or a prosodically motivated dislocation cannot be used to account for these configurations.

In addition, I showed that Wijler sentences are not a gramaticization of 'association' with focus, or even just 'association'. It would fail to account for the contextual restrictions on Wijler sentences, which are distinct from those applying to 'association', and moreover, there are elements of the pragmatic interpretation of Wijler sentences, missing in the corresponding Infl. sentences with the same 'associate', for which a theory of 'association' cannot account.

I showed that Wijler sentences provide an empirical support for the hypothesis that the interpretation of adverbs is derived compositionally. This hypothesis is compatible with the semantic distinctions between Wijler sentences and Infl. sentences. However, current theories assuming the hypothesis of compositionality do not provide a syntax and semantics compatible with the Wijler sentences.

8.2 My Theory of Wijler Sentences

I proposed a new theory of the syntax and semantics of Wijler sentences, as follows:

[A]   Arguments of the verb and optional modifiers of the verb phrase are
       introduced into the syntax via V-FncPs

[B]   The V-FncPs which are arguments of the verb are annotated according to the order in which they are introduced into the derivation

For the semantic analysis of Wijler sentences, I assumed Landman's (2000) theory of the semantics of event, in which I proposed several changes:

[C]   the verb takes as arguments V-Fnc$_n$Ps, denoting a **property of event** s.t., the lexical argument of the V-Fnc$_n$ is assigned the nth thematic role in the event denoted by that verb.

[D]   optional modifiers of the verb phrase denote a property of events, and they take the verb phrase as their semantic and syntactic argument

[E]   I stipulated the following:

   i. The syntactic argument of an adverb is always a semantic argument of it

   ii A constraint on arguments of verbs determining that we cannot take a property of events as the nth argument of a verb unless it **entails that the thematic role associated with the lexical argument of V-fnc$_n$ is filled in with some individual** (be it the value of a constant or of a variable).

In addition, I proposed that:

[F]   Wijler sentences have a discourse function associated with them, which is to contradict an epistemic or a deontic expectation held by the speaker (or temporarily adopted by the speaker) concerning what the adverb says of the property of events denoted in the modified V-FncP.

I showed that my theory of the syntax, semantics and discourse function of Wijler sentences accounts for:

- ♦ The impossibility to have an adverb in Wijler sentences immediately precede a DP or PP which are arguments of a noun or of a preposition

- ♦ The existential entailment with negation and *almost*

- ♦ The restrictions on interpretation of Wijler sentences with *almost*

- ♦ The obligatory 'but-rather' conjunct when negation modifies an argument of the verb

- ♦ The optionality of a 'but-rather' conjunct when negation modifies an optional modifier of the verb

- ♦ The impossibility for a compositionally derived the semantic interpretation of Wijler sentences with *bekoSi* 'barely'

- ♦ The restrictions on the semantic interpretation of *tamid* 'always'

- ♦ The restrictions on the distribution of *rak* 'only', *afilu* 'even' and *gam* 'also' in Infl. sentences

- ♦ The contextually determined restrictions on the distribution of adverbs in Wijler sentences

- ♦ The inference that the speaker deonticaly or epistemicaly expected the described state of affairs to have been different

- ♦ The "queer" interpretation (compositionally impossible) of *bekoSi* 'barely' in Wijler sentences

Thus my theory as stated was shown to account for various seemingly unrelated phenomena characterizing the distribution and interpretation of Wijler sentences.

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