ABSTRACT

Title of dissertation: WITHOUT SPECIFIERS:
PHRASE STRUCTURE AND EVENTS

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This dissertation attempts to unify two reductionist hypotheses: that there is no relational difference between specifiers and complements, and that verbs do not have thematic arguments. I argue that these two hypotheses actually bear on each other and that we get a better theory if we pursue both of them.

The thesis is centered around the following hypothesis: Each application of Spell-Out corresponds to a conjunct at logical form. In order to create such a system, it is necessary to provide a syntax that is designed such that each Spell-Out domain is mapped into a conjunct. This is done by eliminating the relational difference between specifiers and complements. The conjuncts are then conjoined into Neo-Davidsonian representations that constitute logical forms. The theory is argued to provide a transparent mapping from syntactic structures to logical forms, such that the syntax gives you a logical form where the verb does not have any thematic arguments. In essence, the thesis is therefore an investigation into the structure of verbs.

This theory of Spell-Out raises a number of questions and it makes strong predictions about the structure of possible derivations. The thesis discusses a number

of these: the nature of linearization and movement, left-branch extractions, serial verb constructions, among others. It is shown how the present theory can capture these phenomena, and sometimes in better ways than previous analyses.

The thesis closes by discussing some more foundational issues related to transparency, the syntax-semantics interface, and the nature of basic semantic composition operations.

WITHOUT SPECIFIERS: PHRASE STRUCTURE AND EVENTS

by

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Acknowledgments

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though I am even more grateful for all the lunch conversations and his friendship.

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sure that I don't work all the time. Thanks also to my good friends in Norway for staying in touch, and especially to Kirsti Koch Christensen, Jan Olav Gatland, Jan Erik Grindheim, Aase Marthe Horrigmo, Georg Kjøll, Gjert Kristoffersen, Marianne Lind, Curt Rice, and Marit Westergaard.

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Contents

Chapter 1

Introduction

1.1 Outline

This thesis is fundamentally about the size of verbs. The question I am asking is whether verbs have information about their arguments that they project into the syntax or not. I am going to pursue an approach where verbs do not have such information and ask what the implications are for our theories of syntax and the interface between syntax and semantics. I will argue that two seemingly unrelated phenomena are actually intimately related: whether thematic arguments should be severed from the verb and whether there is a syntactic difference between external and internal arguments. The objects of study here are the mental representations underlying these two phenomena.

It has long been known that hierarchical syntactic structures important for semantic interpretation; in modern times, this goes back at least to Chomsky (1955, 1976) and May (1977). In particular May's work lead to a range of interesting constraints on LF, which is a syntactic level of representation that serves as input to semantic interpretation (see also Huang (1982), May (1985), Heim and Kratzer (1998), among others). However, for most semanticists, they have assumed what they need to assume in order to get their semantic derivations to work, rather than investigating the syntactic representations themselves. Syntacticians, on the other

hand, tend to set aside concerns for how their syntactic structures eventually will get interpreted. The goal of the present work is to bring syntax and semantics together such that syntax transparently maps onto semantics, where transparency really means transparency in the spirit of Montague (1974b). I will do this by focusing on two domains of grammar: phrase structure and argument structure.

The core idea that I will explore is that eliminating the phrase structural difference between external and internal arguments makes it possible to give a transparent account of how syntactic structure maps onto fully severed Neo-Davidsonian logical forms. That is, by eliminating the relational difference between specifiers and complements, I am able to provide a syntax that maps transparently onto Neo-Davidsonian logical forms. Simplifying for now, a sentence like (1) will have the logical form in (2).

(1) Brutus stabbed Caesar.

(2) $\exists e[\text{stab}(e) \ \& \ \text{Agent}(e, \text{Brutus}) \ \& \ \text{Theme}(e, \text{Caesar})]$

Each piece of the syntactic structure that is spelled out will correspond to each of these conjuncts. Chapter 4 will show in great detail how this works.

I will refer to Neo-Davidsonian representations of the sort in (2) as full thematic separation. My main proposal will consist of revising Spell-Out domains such that each Spell-Out domain gives a conjunct at logical form. Each Spell-Out domain will be conjoined and existential closure will be added at the end. Together with the mapping principles that maps syntactic structure into logical forms, I will also assume translation principles that determine how elements manipulated by the

syntax are translated into a logical notation for interpretation.

This introductory chapter will briefly outline some of my core assumptions, which involves saying a bit about which particular version of the Minimalist Program I will be working with. A roadmap of the chapter will also be provided. I will not discuss more general and foundational questions concerning the nature of syntax and semantics and how they relate to each other, and in particular how the theory I will develop is (or is not) compositional. I will leave some of these questions for chapter 6, where I discuss issues concerning how complex syntax and semantics are and how we should think about compositionality from a mentalistic perspective.

1.2   A Minimalist Syntax and Semantics

The approach I will be pursuing here follows the Minimalist Program (also just called Minimalism) initiated by Chomsky (1995c). Minimalism is an attempt at deepening our understanding of Government and Binding Theory (GB). That is, Minimalism builds on the successes of GB and asks why the Faculty of Language should have these properties as opposed to other properties one can imagine, cf. Boeckx (2006), Hornstein (2009) and Lasnik and Lohndal (In press). As such, Minimalism does not constitute a paradigmatic change. Rather, it takes the results from GB for granted and attempts at advancing our understanding of these results. Thus, in essence, the approach is not extremely different from GB since it relies on GB and develops the theory further by asking new and deeper questions, in particular *why* the theory should look the way it does, and more recently, how the

Faculty of Language developed evolutionarily. It is, however, important to stress that Minimalism would not have been possible had there not been GB to rationalize.

The architecture of the grammar that is typically assumed is given in (3).

(3)   LEXICON

$\Downarrow$

Narrow Syntax: External and Internal Merge

$\Downarrow$

PHON $\Leftarrow$ Spell-Out $\Rightarrow$ SEM

$\Downarrow$

PHON $\Leftarrow$ Spell-Out $\Rightarrow$ SEM

$\Downarrow$

PHON $\Leftarrow$ Spell-Out $\Rightarrow$ SEM

$\Downarrow$

. . .
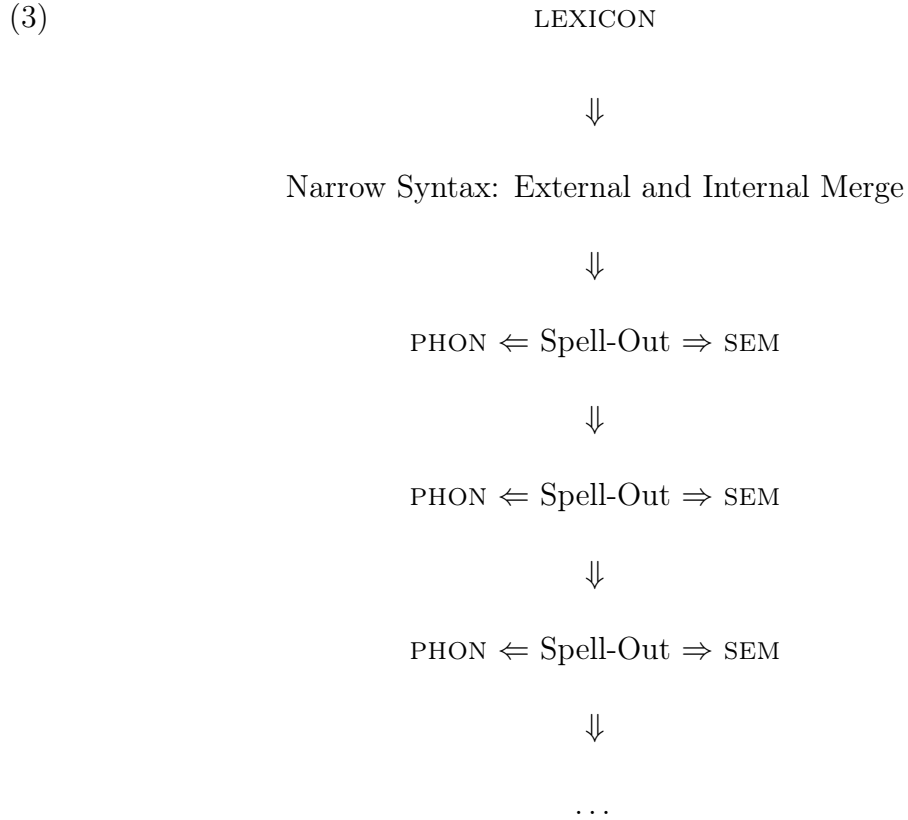
I am not going to say much about the lexicon at this point as I will return to it below. I will also stay neutral as to whether there is a Lexical Array/Numeration or not; this will not affect any of what follows.[1] The basic operation in narrow syntax is Merge. Merge can create either an ordered or an unordered set. I will follow Chomsky (2004) in assuming that Set Merge gives an unordered set $\{\alpha, \beta\}$ whereas Pair Merge gives an ordered set $< \alpha, \beta >$.[2] Merge also comes in two 'flavors': External Merge and

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[1]See Collins (1997), Putnam (2007), Stroik (2009a,b) for discussion of the importance of numerations.

[2]See Zwart (2009, 2011) for a different view.

Internal Merge. The former can be paraphrased as 'first-Merge' whereas the latter corresponds to movement. Formally, these two operations amount to the same: two elements are put together and the operation itself does not differ depending on whether the element comes from the lexicon or whether it is an element that already exists in the structure and that is being re-merged. See also Hunter (2010) for more discussion. In chapter 5, we will see reasons for abandoning this view and for returning partly to the view in Chomsky (1995c) where Move is a composite operation consisting of Copy and Merge.

At certain points during the derivation, pieces of structure are sent off to the interfaces. These pieces are sent to both interfaces at the same time (pace Marušic (2005)). This is done by the operation Transfer. Chomsky (2004) calls the phonological part of Transfer 'Spell-Out'. Here I will not make this distinction and use Spell-Out synonymously with Transfer. In the literature, these pieces of structure are typically called *phases*, but since the size of the pieces will be different than the standard pieces in the literature, I will avoid using that label.

(3) refers to the interfaces as SEM and PHON. The two interfaces are accessed by the Sensori-Motor system (sometimes called the Articulatory-Perceptual system) and the Conceptual-Intentional system. This follows Chomsky (2004: 106) who argues that: 'The last line of each derivation D is a pair <PHON, SEM>, where PHON is accessed by SM and SEM by C-I. D *converges* if PHON and SEM each satisfy [interface conditions]; otherwise it *crashes* at one or the other interface'. The following quote elaborates on this (see also Hinzen (2006) for much discussion).

(4)   Assume further that L has three components: *narrow syntax* (NS) that maps

LA [lexical arrays] to a derivation D-NS; the *phonological component* Φ maps

D-NS to PHON; the *semantic component* Σ maps D-NS to SEM. Σ is as-

sumed to be uniform for all L; NS is as well, if parameters can be restricted

to LEX (as I will assume). Φ, in contrast, is highly variable among Ls. Opti-

mally, mappings will satisfy the *inclusiveness condition*, introducing no new

element but only rearranging those of the domain. Assume this strong con-

dition to be true of NS. [...] In this conception there is no LF; rather, the

computation maps LA to <PHON, SEM> piece by piece, cyclically. There

are, therefore, no LF properties and no interpretation of LF, strictly speak-

ing, though Σ and Φ interpret units that are part of something like LF in a

noncyclic conception (Chomsky 2004: 107).

This is a quite different view of grammar if we compare it to GB: No Surface Struc-

ture or Deep Structure (though see Uriagereka (2008) for a critical discussion of

the latter claim), and also no LF conceived of as a syntactic level of representation.

If there is no LF, then the syntactic structure has to be mapped directly to SEM

(more on SEM shortly). Semantic interpretation is therefore still derived from syn-

tactic representations, and even more directly if there is no intermediate level of

representation.[3]

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[3]This makes the contrast with other approaches, such as Generative Semantics, quite stark:
There, it was assumed that a given meaning (deep structure for generative semanticists) was the
input to the syntax (see, e.g., Lakoff (1971)). Thus the view here assumes that SEM is interpretive
rather than generative.

Clearly, the question of whether LF is really required is an empirical question. Jacobson (1998, 2008) argues that LF is not necessary in order to give an account of antecedent-contained deletion, which has often been taken to be one of the strongest arguments for LF. But non-movement accounts do not come for free, and they also do not predict any constraints on movement. We know that such constraints exist, which is prima facie a problem for non-movement accounts. Related to this issue is the argument in Huang (1982), which shows that overt and covert movements are subject to different island restrictions. As far as I know, no one has provided a new analysis of these data within a single-cycle model, that is, a model that dispenses with LF.[4] However, the theory I will develop is not compatible with a distinct level of representation such as LF. It would be impossible to create the full syntactic representation that would be required, for say, covert *wh*-movement at LF. In the future, for this model to be sustained, Huang's arguments will have to be addressed, as I discuss in chapter 6.

An important feature of Minimalism is the focus on the interfaces themselves. Within Minimalism, a lot of work is currently being done researching various aspects of the interfaces. This is particularly true for the PHON side where we by now have several articulate proposals as to what the concrete architecture of this system looks like, cf. Samuels (2009, 2011), Embick (2010), Idsardi and Raimy (In press), Lohndal and Samuels (2010). On the SEM side, however, little work has been done. It is my hope that part of the present work will help further our understanding of the nature

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[4]Note that the problem does not go away if all islands effects are PF effects, in effect, it makes the problem more acute since there is no way of capturing these differences on such a theory.

of SEM, and I develop some concrete proposals in chapter 4 concerning SEM.

Continuing the focus on the semantic side of this architecture, an obvious question emerges from the quote above: What exactly is the *semantic component* Σ? I argue that Σ is just a Spell-Out rule. These rules determine the mapping from narrow syntax to SEM. I will give several such rules in chapter 4, where for example functional heads will help determine how arguments are interpreted. This will enable us to account for semantic differences between external and internal arguments, cf. Dowty (1991), Schein (1993), Kratzer (2000), Pietroski (2005a).

In line with the quote from Chomsky above, I assume that SEM is what you get after the narrow syntactic representation has been handed over to the semantic interface through Σ. I will show that the syntactic representations can be mapped onto conjuncts. These conjuncts are then conjoined and existential closure is added. The resulting logical forms are close to 'earlier conceptions of logical form (or logical syntax) [...] found in the work of philosophers like Frege, Russell, Carnap, and Strawson' (Hornstein 2002: 345). The syntax will have a crucial role in providing the input to the logical forms, and a major topic in chapters 4 and 6 will be how these forms are generated. Below, I will argue that these logical forms furthermore can serve as instructions to build concepts, in the sense of Chomsky (2000a), Pietroski (2008b, 2010a, 2011).

I would now like to come back to the question of basic operations. I have already stated that on the syntactic side, the basic operation is Merge. Similarly, on the semantic side I will follow Neo-Davidsonians and particularly Schein (1993, In press) and Pietroski (2005a, Forthcoming) in arguing that the main operation is

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Conjunction. That is, for a sentence like (6), Conjunction chains all the predicates together.

(5) Peter bought a dog

(6) ∃e[buy(e) & Agent(e, Peter) & Theme(e, a dog]

There is no use of Functional Application. All there is is Conjunction chaining together predicates, and then existential closure to bind the event variable. In chapter 4 I will have more to say about how the arguments *John* and *a dog* are integrated into the thematic predicates.

In the architecture I am working within, there will be mapping principles between syntax and semantics that yield logical forms. These logical forms are not 'complete' logical forms in that they do not have access to conceptual content. To see what I mean by this, consider the following example. (7) has a perfectly valid syntax and a perfectly valid logical form (8), and despite this, the sentence is not judged to be acceptable.

(7) Colorless green ideas sleep furiously.

(8) ∃e[Theme(e, colorless.green.ideas) & sleep(e) & furiously(e)][5]

However, I argue that the weirdness associated with (7) is not a grammatical weirdness; it is a conceptual weirdness: Ideas do not have colors and they cannot sleep in any possible way. The idea is that the logical form in (8) is perfectly valid as a

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[5]In this thesis, I am going to use labels such as 'Agent' and 'Theme/Patient', though see Dowty (1991) for a critical discussion. See also Schein (2002) for a defense of this terminology and chapter 3 for some more discussion.

logical form because either the concepts have not been fetched or the wrong concepts have been fetched. This is supported by the fact that (7) can have metaphorical uses. A case that I would argue is similar is the following.[6]

(9) Humans levitate.

This sentence is fully acceptable, but it does not describe a situation that typically happens in our world. This does not have anything to do with grammar - rather it is an issue of how internalistic meanings relate to external properties. In that sense, it is on a par with sentences involving *unicorns*.

(10) Unicorns are pretty.

Again, this sentence is perfectly fine and it has a coherent meaning only as long as we do not operate within our world. The concepts that are fetched will have to be given a metaphorical meaning in order to 'make sense'.

More generally, I subscribe to the view that SEMS are instructions that get executed at the semantic interface (see, e.g., Pietroski (2010a) and Glanzberg (2011)). Crucially, no semantic information is available in the syntax (cf. Marantz (1997), Borer (2005a), Marantz (2005), Åfarli (2007), Platzack (2011), Larson (Forthcoming); pace Ramchand (2008)) – what we tend to think of as 'semantic information' will on this view be conceptual information that is not available to syntax, cf Chomsky (2000b).

There are examples of sentences that are unacceptable and where it is very hard if not impossible to make the sentence acceptable. A case in point is given in

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[6]Thanks to Barry Schein (p.c.) for bringing up this case.

(11).

(11)   *John arrived Mary.

Everyone would agree that this example should receive a star, but that is basically where the agreement ends. The question is what to make of the star. Most researchers would say that this is a syntactic problem: *arrive* is an unaccusative verb and unaccusative verbs cannot take two arguments (see e.g., Ramchand (2008) for recent and very clear discussion). This is supposed to explain the star. However, we should consider, following Borer (2005a) and Pietroski (2007), that the sentence may be bad for non-syntactic reasons. What could be wrong is that the concept *arrive* cannot combine with two nominal arguments to yield a legible interpretation. A nominal and a non-nominal element do not create problems:

(12)   John arrived at work.

Compared to (7), the difference is that (11) never acquires a legible interpretation, whereas (7) does. In chapter 3, I will discuss issues concerning (11) in great detail and present both a conceptual and a grammatical account.

The syntactic and the non-syntactic approaches may appear to be six of one, half-dozen of the other but I want to emphasize that they are very different. On Borer's view, verbs do not have adicities that constrain the computation. This goes against a very common assumption that verbs have thematic arguments. Another way to put this is that the grammar operates on sentence frames: The verb comes into the derivation with information that basically encodes how the sentence will look like. The Borer view, on the other hand, does not make use of sentence frames at

all.[7] Again, on her view, verbs do not have adicities that constrain the computation. This means that one needs a different explanation of cases like (11).

The view that most semantic information is not available to the syntax should not be very controversial, as Adger and Svenonius (2011) point out: 'The consensus since the early 70's has been that semantic selection is not part of syntax, but rather part of some semantic module or of the conceptual-intentional domain of thought'. This fits into the general view where category selection is replaced by semantic selection, cf. especially Grimshaw (1979). Borer (2005a) makes that very explicit when she argues that complementation is determined by non-syntactic factors. Ramchand (2008: 4) calls this the generative-constructivist view. However, it's worth bearing in mind, as Ramchand points out, that there are two 'extremes' within this camp:

(13)   *The naked roots view*

The root contains no syntactically relevant information, not even category features (cf. Marantz (1997, 2001, 2005), Borer (2005a)).

(14)   *The well-dressed roots view*

The root may contain some syntactic information, ranging from category information to syntactic selectional information and degrees of argument-structure information, depending on the particular theory. This information is mapped in a systematic way onto the syntactic representation which di-

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[7]Borer (2005a: 14) makes use of 'templates' when she says that '[...] the syntactic structure gives rise to a template, or a series of templates, which in turn determine the interpretation'. These templates are different from frames, as they are generated by syntactic principles and not by properties of lexical items.

rectly encodes it.[8] (Ramchand 2008: 11).

Both views are different from Construction Grammar (Goldberg 1995) since the latter assumes that constructions are listed and stored. The generative-constructivist view is generative, which means that constructions are non-primitive and generated based on minor building-blocks in a generative system. Ramchand (2008), among others, develops a view that sits between the naked roots view and the well-dressed roots view in that she allows roots to bear some syntactic information.

An alternative view is what Ramchand (2008: 4) calls the lexical-thematic approach. This is an approach where the relevant information is projected from the lexicon and the lexicon has its own generative operations (see in particular Levin and Rappaport Hovav (1995, 2005)). On this view, (category) selection can be implemented in the syntax via features (e.g., Chomsky (1965), Emonds (2000), Reinhart (2002)). Since selection is always local (Baltin 1989), there will have to be a locality constraint on how these features are checked. Svenonius (1994) implements this by connecting head-movement and c-selection, whereas Adger (2003) argues that subcategorization features always require require local checking.[9] Yet another suggestion is to use mutual-command to define checking domains for selection, as in

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[8]Ramchand points out that this view is virtually indistinguishable from what she calls 'the static lexicon view', which is the view that the lexicon contains argument-structure information that correlates in a systematic way with syntactic structure. See Baker (1988) for such a view.

[9]A quite different version of this is pursued by Larson (Forthcoming) who argues that there are theta-features (in the sense of Hornstein (1999)) that encodes a purely syntactic notion of selection. For Larson, the lexicon does not contain any statements of what kind of arguments e.g., verbs take. See his work for details.

Hallman (2004).

In chapter 3, I will give good reasons for thinking that the generative-constructivist solution is the better way to go, but the point here is just that there is technology to implement selection in the syntax should one want to do that, cf. footnote 9. This technology would also be compatible with the syntax that I will defend in this thesis.

There is another reason why the generative-constructivist way (either as in Borer, Larson or Marantz) may be feasible. It contributes to making syntax completely autonomous, but also to maintaining that the computational system of the Faculty of Language is fully intensional in Chomsky (1986b)'s sense. Logical forms do not say anything about what the conceptual content of the concepts IDEA or CAT is (cf. Pietroski (2007).[10] Logical forms are therefore underspecified: They provide a template for interpretation. This dovetails with, though does not force, the view that semantics is not truth-theoretic (see in particular McGilvray (1998), Pietroski (2005b, Forthcoming, 2010b), Lohndal (2011a) for a defense of this view). Logical forms contribute to truth conditions, but they underdetermine them as there is no 'content' contribution by the items that make up syntactic terminals or logical forms. This means that semantic identity effects that we see in e.g., ellipsis will have to apply when the concepts have been fetched. Exactly how this works will have to be developed in detail in future work.

Since the early days of generative grammar it has been common to assume a

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[10]This does not mean that one does not have to connect concepts to the world somehow; see Fodor (2008) and especially Kjøll (2011) for ideas on how one might do this.

specific form of isomorphism between syntax and logical form. Subcategorization frames encode, for example, that the verb *kill* takes two arguments: a subject and an object. In the semantic derivation, it is assumed that *kill* is dyadic. With Davidson (1967), logical forms acquired an event variable, and this marks the fall of the isomorphism since it was not argued within generative syntax that this event variable finds a place in the hierarchical syntax. Kratzer (1996) argues that Themes are part of the lexical specification of the verb, both in the syntax and at logical form, but also she does not put the event variable in the syntax. Scholars who assume full thematic separation (tacitly) assume that the verb or the root is entirely bare in the syntax, and that it only has an event variable in the semantics. How to encode relations between events is usually not discussed. I will return to the spirit of the older view and argue that if the logical form has one or more event variables, syntax could encode those event relations. This will yield a certain version of transparency. I will return to this in chapters 4 and 6, including what I take transparency to mean, but I want to offer a few general remarks here.

As Bach (1976) points out, every theory needs to make explicit the relationship between expressions in the language that is being described and the expressions in an interpreted language that specifies the meaning. Bach distinguishes between what he calls the 'configurational hypothesis' and the 'rule-to-rule' hypothesis. We can formulate them as follows.

(15)   Given a structure of a given form, translate the structure into an expression
        in the interpreted language of a given form.

(16)   For each syntactic rule, there is a unique translation rule.

The rule-to-rule hypothesis gives a more transparent mapping, in that there are no additional levels, as Bach makes clear. However, he does not say anything about how the metalanguage is related to our competence regarding the object language. Bach observes that the configurational hypothesis has no inherent limitations on the nature of the mapping relation. Bach (1976: 186) states this clearly when he says '[...] there is no inherent limitation in the hypothesis to prevent stating rules of the configurational sort for structures of arbitrary complexity. On the other hand, a rule-to-rule hypothesis must fix the translation of the constituents as they are put together'. A lot of work in the generative tradition has argued that a rule-to-rule hypothesis is not tenable because of phenomena such as antecedent-contained deletion, and covert *wh*-movement in Chinese. But it is also not the case that 'anything goes', and this is what I take to be the main point in Bach's paper. Restrictions are necessary, both for a child learning a language, and for the theorist in making predictions about what a possible rule/mapping is. A major point in this dissertation is that we can create a constrained theory exactly by adopting the two reductionist hypothesis that I mentioned at the outset: No relational difference between specifier and complements, and that verbs do not have thematic arguments. Taken together, this gives us a theory where each application of Spell-Out corresponds to a conjunct in a logical form.

There is also another related issue which has to do with reversability. To what extent are the mapping principles we postulate reversible? That is, given

a logical form that exhibits full thematic separation, can we reverse the mapping principles and generate a hierarchical syntactic structure on the basis of a logical form? The more transparent the mapping is, the easier it will be to reverse the mapping principles. We know that relative clauses present a clear case where the principles are not reversible. Consider the relative clause in (17) and its syntactic structure in (18).

(17)   students who knew Mary

(18)

students
        who$_1$
            t$_1$
                knew   Mary
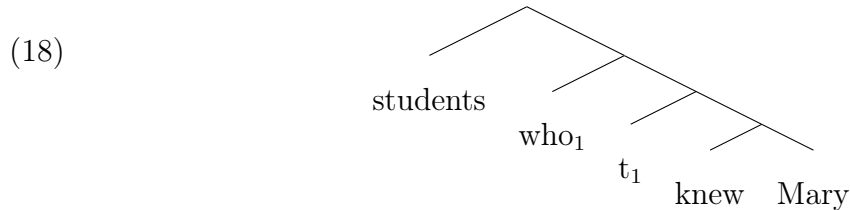
A standard derivation for the relative clause runs as follows, based on Heim and Kratzer (1998). The $[\![\,]\!]^{\mathcal{A}}$ brackets signify the interpretation and the superscript A is the assignment function.

(19) $[\![$[knew Mary]$]\!]^{\mathcal{A}} = \lambda y \lambda x.$ x know y(Mary) $= \lambda x.$ x knew Mary

(20) $[\![$[t$_1$ [knew Mary]]$]\!]^{\mathcal{A}} = \lambda x.$ x knew Mary(A[1]) = A[1] knew Mary

(21) $[\![$[who$_1$ [t$_1$ [knew Mary]]]$]\!]^{\mathcal{A}} = \lambda x.$ x knew Mary

(22) $[\![$[students [who$_1$ [t$_1$ [knew Mary]]]]$]\!]^{\mathcal{A}} = \lambda z.$ z are students & z knew Mary

Merging *who* corresponds to lambda-abstraction, and merging *students* invokes predicate modification, which essentially conjoins *students* and *x knew Mary*. I have skipped several intermediate steps here but urge the reader to trust me that I provide the most important details. For present purposes, the important question is: How can we go from the last step of the derivation back to the syntactic structure in

(18)? Due to conjunction and lambda abstraction, it is impossible to go back. What would lambda abstraction correspond to? In a relative clause, it can be lexicalized by either *who* or *that*. Furthermore, how would the system know how to interpret the conjoined structure, a structure that also resembles the way in which adjectives are analyzed, e.g., *big elephant*. So relative clauses are not reversible in the sense that the thematic part of the clause is.

This issue may seem somewhat insignificant. However, once we ask what the relationship is between the formalism and how this formalism is implemented in terms of I-language computations, the question becomes very important. We both produce and understand speech, and how do we go from the speech signal to understanding a given structure? Do we employ principles that are similar to the ones that are used to build up structures when we produce speech? From this perspective, we can think of the reversability issue as parallel to the generation and parsing of syntactic structures. The more transparent the mapping is, the more likely it is that we employ similar principles in production and parsing. I will come back to the issue of transparency in chapters 4 and 6.

Throughout the thesis, the existence of event variables will be taken for granted. See Davidson (1967), Taylor (1985), Parsons (1990), Lasersohn (1995), Bayer (1996), Rothstein (1998), Landman (2000) and Tenny and Pustejovsky (2000) for summary of the traditional arguments in favor of events. Lexical items or roots can either be born with an event variable in the encyclopedia, or roots get an event variable from their categorizer. The latter view entails that the categorizer contributes the event variable, as in the following illustration for a verb.

(23)

$$
\begin{array}{c}
v \\
\diagup\diagdown \\
v_{(e)} \quad \sqrt{\text{KILL}}
\end{array}
$$

How event variables are introduced depends on the particular framework within which one is working, and since the choice does not matter for what follows, I will for reasons of simplicity follow the former view.

Summarizing, I am arguing for a theory where there is no phrase-structural difference between specifier and complements. This, I will argue, go together with logical forms that exhibit full thematic separation. In this section I have discussed some more general architectural issues. At this point I am not attempting to convince the reader that the perspective I have just outlined is the correct perspective. Obviously that requires much more motivation and I encourage the reader to consult some of the references I have provided. However, it is important to make the assumptions clear and that is what I have tried to do. For a more thorough introduction to how one can think about semantics explicitly from an I-language perspective, see Larson and Segal (1995), McGilvray (1998), Chomsky (2000b), Pietroski (2005a) and Elbourne (2011), among others.

1.3   A Roadmap

In this section, I will provide a short summary of each of the chapters.

Chapter 2 reviews the history of how X-bar theory developed and how X-bar theory later developed into Bare Phrase Structure. I will mostly focus on specifiers, and the goal will be to show that specifiers are stipulated and this will eventually

lead to the conclusion in chapter 4 that they should not be distinguished from complements. I start out by discussing Chomsky (1970) and Jackendoff (1977). I will not focus too much on the details of the empirical analyses but rather try to distill the core theoretical aspects. The reason for this is that the theory has changed a lot since that time, which means that the particular analyses won't be that relevant for what will follow in this thesis. After this review of the Extended Standard Theory's view of phrase structure, I move onto Government and Binding Theory and discuss Chomsky (1986a) and Fukui and Speas (1986). In particular, *Barriers* represents the culmination of X-bar theory since it crystalizes the standard X-bar theory. Fukui and Speas's work is important because it differentiates lexical and functional projections (see Abney (1987) for more discussion of this) and puts certain constraints on phrase structure that we will see reoccurring in various ways. Then I turn briefly to Kayne (1994), which is the last theory of phrase structure before Minimalism. The next section is then devoted to Bare Phrase Structure, and I discuss this theory in a more detailed way than the other theories since it is the theory I will be working with and modifying in this thesis. I spend quite some time discussing limitations of Bare Phrase Structure when it comes to specifiers, which naturally leads me to consider Starke (2004)'s claim that specifiers should not be part of phrase structure. I will discuss his view and some limitations it has, and also briefly Narita (2009, 2011), who puts forward a theory of Spell-Out that will turn out to be relevant for my own proposal in chapter 4.

Chapter 3 has a much more semantic focus. I go through numerous arguments from the literature claiming that arguments need to be severed from the verb,

or, to put it differently, that full thematic separation is required. The arguments will mainly be drawn from Schein (1993), Herburger (2000), Pietroski (2007) and Williams (2008). I will also discuss Kratzer (1996)'s argument that Themes should not be separated from the verb and argue that this does not provide evidence against separation.

In chapter 4, I present a syntactic proposal that can derive full thematic separation in the sense that the syntax together with Spell-Out principles give a transparent mapping from the syntax to logical forms. I develop an idea of Spell-Out which draws inspiration from Moro (2000)'s work and more recently Narita (2011). The idea is that whenever two phrases want to Merge, Spell-Out has to happen so that the phrase that is on the 'spine' will be reduced to a head, following Bare Phrase Structure. After I present the core proposal, I address various implications on both the semantic and syntactic side concerning composition operations, and I provide more details of how Spell-Out works.

In chapter 5, I discuss various consequences of the present theory. I particularly focus on the Extended Projection Principle (EPP) and how my proposal supports a specific way of understanding the nature of the EPP. My conclusion will be that the EPP is less of a deep phenomenon than many others have been led to conclude. I also discuss how movement works, and show how the present theory bans multidominance representations. Next, I discuss locality and what the present proposal can say about how one can derive certain freezing and island facts. Serial verbs are then addressed and shown to offer additional support in favor of my theory. Lastly I talk about how my view can account for the Uniformity of Theta Assignment Hypothesis

(Baker 1988) and how this relates to how arguments are integrated into their event predicates.

The present work raises some questions concerning how syntax and semantics are structured and how they interface with each other. In chapter 6, I will address some of these questions and consider what it means for either syntax or semantics or both to be simple or complex from the point of view of transparency. This will lead to preliminary discussion of 'semantic compositionality' as well.

Chapter 7 briefly summarizes the main claims.

Chapter 2

Specifiers and Phrase Structure

2.1 Introduction

The goal of this chapter is to discuss how the notion of a *specifier* has developed within Chomskyan generative grammar. In particular, the most recent conception of phrase structure, known as Bare Phrase Structure, will receive a lot of attention. This is the framework of phrase structure within which contemporary minimalist research is conducted, and this is also the version of phrase structure that I will build on in the present thesis. The goal is not to scrutinize all aspects of phrase structure. For the most time, I will focus on specifiers and how they fit into the overall view of phrase structure. But this will lead to discussions of many aspects surrounding phrase structure in some way or other. The main goal of the chapter is to motivate the conclusion that there is no relational difference between specifiers and complements.

Since specifiers originated with the invention of X-bar theory in Chomsky (1970), I will provide a short tour of how the notion of a specifier has developed since Chomsky's seminal paper. I will look at that paper in some detail, and then at the revision by Jackendoff (1977). We will then look at the view of phrase structure that emerged in Chomsky (1986a), which is the traditional X-bar theory. After that, the minimalist view of phrase structure (Chomsky 1995c) will occupy

the remainder of the chapter. It is necessary to discuss Bare Phrase Structure and specifiers in great detail because it turns out that there are reasons to eliminate the relational distinction between specifiers and complements. By way of motivating this, I will discuss a lot of the issues surrounding specifiers, and argue that as far as the grammar is concerned, the core relation is that between a head and a non-head.

I will not discuss theories of phrase structure prior to 1970 (see Stowell (1981: 66-71), Lasnik (2000) and Lasnik and Lohndal (In press) for discussion). The reason for this is that specifiers as such did not exist in those phrase structure grammars. Of course, notions like 'subject' did exist, and one could have stipulated a specifier if one wanted too (see the discussion of Chomsky (1970) below), but that was not done. Therefore it seems less relevant to look at those theories and rather focus on the theories where specifiers have been explicitly defined.

This chapter is structured as follows. Section 2 discusses the Extended Standard Theory. In section 3, I look at Government and Binding, which also includes Kayne (1994) as that is the last pre-minimalist theory of phrase structure. Section 4 discusses the Minimalist Program and its view on phrase structure. Bare Phrase Structure will be discussed in detail, and in particular the problems that Bare Phrase Structure faces in dealing with specifiers in a satisfactory way. I will also discuss some more recent work that suggests that specifiers should not be part of the theory of phrase structure. Lastly, section 5 concludes the chapter.

2.2 The Extended Standard Theory

In this section, I will discuss the two most prominent views on phrase structure within the Extended Standard Theory (EST), namely that of Chomsky (1970) and Jackendoff (1977).

2.2.1 Chomsky (1970) and the introduction of X-bar theory

One problem in Chomsky (1955) and Chomsky (1957) is that the theory developed there allows phrase structure rules like (1) alongside ones like (2) (Lyons 1968).

(1)   NP $\rightarrow$ ... N ...

(2)   VP $\rightarrow$ ... N ...

But there do not seem to be rules like (2). Why is this? The formalism allows both rules, and the evaluation metric (Chomsky 1965) judges them equally costly. Chomsky (1970) is the first attempt to come to grips with this problem. There it is proposed that there are no individual phrase structure rules of the sort that did so much work in Chomsky (1957) and even in Chomsky (1965). Rather, there is what is now known as the X-bar schema. X is a variable, ranging over category names such as V, N, and so on.

Here is the version of X-bar theory that Chomsky (1970) presented (see also Emonds (1976) and Jackendoff (1977) for much relevant discussion).

(3)   X' $\rightarrow$ ... X ...

X" $\rightarrow$ ... X' ...

X' and X" are placeholders for true complex symbols. Keep in mind that in *Syntactic Structures* NP looked like it had something to do with N, but in that system it really did not. NP was just a symbol that was written for mnemonic purposes with two letters. In X-bar theory, a category label is a letter plus a number of bars. (originally written as overbars - e.g., $\overline{X}$ - but later written as primes - e.g., X' - for typographical convenience). It can be thought of as an ordered pair. X is <X, 0>, X' is <X, 1>, and X" is <X,2>. X-bar theory immediately explains why there are no rules like (2). This is because phrases have heads, i.e., they are endocentric, which is to say that phrases are projections of heads.

Chomsky also introduced the relational notions *complement* and *specifier*. A complement is a sister to a head. He argues that complements do not play any role in transformations (Chomsky 1970: 210), that is, complements cannot be the target qua complements of any transformational operations. At this point, there were general rules like (7) that subsumed rules like the ones in (4)-(6).

(4)   NP → N Comp

(5)   VP → V Comp

(6)   AP → A Comp

(7)   Comp → NP, S, NP S, NP Prep-P, Prep-P Prep-P, etc.

The rules in (7) should instead be replaced with the rule in (8).

(8) $\overline{X}$ → X ...

The dots in (8) indicate that there are no restrictions on what can be a complement and where the complement is placed vis-á-vis the head.

Chomsky then proposes that in order to 'introduce further terminological uniformity, let us refer to the phrase associated with $\overline{\text{N}}$, $\overline{\text{A}}$, $\overline{\text{V}}$ in the base structure as the "specifier" of these elements' (Chomsky 1970: 210).

(9) $\overline{\overline{\text{X}}} \rightarrow [\text{Spec},\overline{\text{X}}]\ \overline{\text{X}}$

On this view, a specifier encompasses a heterogeneous set as it contains a variety of 'pre-head' elements like auxiliaries in Spec$\overline{\text{V}}$, determiners in Spec$\overline{\text{N}}$, adverbials in Spec$\overline{\text{V}}$ and degree modifiers like *very* as Spec$\overline{\text{A}}$. As Jackendoff (1977: 14) points out, it is not clear whether Chomsky considers the specifier to be a constituent or an abbreviation for a sequence of constituents, like Comp. The diagrams in Chomsky (1970) show specifiers like a constituent. As we will see below, Jackendoff (1977) argues against specifiers being constituents whereas Hornstein (1977) defends the claim that they are. However, beyond being a constituent and bearing a geometrical relation to a head, it is not clear what the defining characteristics of a specifier are taken to be (see also George (1980: 17)).[1] Chomsky (1970) does not say anything about possible selectional restrictions that may obtain between a specifier and the rest of the phrase. Only later did that become a topic of discussion; see in particular Grimshaw (1979) on selection more generally. I will return to this issue in chapter 3; see also chapter 1. For now, it suffices to establish that complements and specifiers did seem to behave in different ways in Chomsky (1970).

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[1]Of course, an implicit assumption here is that there are defining characteristics of specifiers, and that they are not just descriptive terms. Specifiers have to be generated, and the question is how the grammar does that. Put differently, how does the grammar differentiate between generating a specifier and generating a complement, and how can we *explain* that difference?

Later a biconditional version of X-bar theory was developed, namely that phrases have heads, and heads project. Whenever a structure has an XP, it has an X (this is what Chomsky (1970) suggested), and whenever a structure has an X, it has an XP.

In Chomsky (1970), the initial rule of the base grammar is as in (10).

(10) $S \rightarrow \overline{\overline{N}}\, \overline{\overline{V}}$.

This means that X-bar theory is not fully general: S and S' (the latter the larger clause including a sentence introducing complementizer like *that*) do not fit into the theory in any neat way.[2] These labels are not projections of heads, unlike the other labels in the system. There is another way in which S does not fit into the theory. Semantically it is of adicity zero, unlike a VP when we assume event variables (see chapter 3 for further details). Expressions with adicity zero have always represented an anomaly in the theory, which raises the question whether adicity one, two or three expressions are well founded too. I will return to this important question in chapter 3.

It is worth bearing in mind that Bresnan (1972) suggests that complementizers are essentially specifiers of sentences through the rule in (11) (Bresnan 1972: 13).

(11) $\overline{S} \rightarrow COMP\ S$

This is in line with the general approach to specifiers during the 1970s, as complementizers are here analyzed on a par with auxiliaries, which were also specifiers.

---

[2]Though see Jackendoff (1977) for a way to solve this problem by identifying S with V" in his system. See also Hornstein (1977) who argues that S is not a projection of V.

It may be worth pausing to reflect on what pushed Chomsky to create X-bar theory.

(12)   The development of X' theory in the late 1960s was an early stage in the effort to resolve the tension between explanatory and descriptive adequacy. A first step was to separate the lexicon from the computations, thus eliminating a serious redundancy between lexical properties and phrase structure rules and allowing the latter to be reduced to the simplest (context-free) form. X' theory sought to eliminate such rules altogether, leaving only the general X'-theoretic format of UG. The problem addressed in subsequent work was to determine that format, but it was assumed that phrase structure rules themselves should be eliminable. (Chomsky 1995a: 61).

The attempt was to do away with redundancies. Another way to say this is that when we impose strict constraints, the PS rules themselves vanish (see in particular Lasnik and Kupin (1977)). It is possible to view the change from phrase structure rules to X-bar theory in the same way as Chomsky (1973)'s generalizations of some of Ross (1967)'s locality "island" constraints on movement. In both cases, instead of more or less idiosyncratic properties, we get general properties that hold across categories. Baltin (1982: 2) puts the general development this way:

(13)   The history of transformational generative grammar can be divided into two periods, which can be called expansion and retrenchment. During the early 'expansion' period, a primary concern was the description of grammatical phenomena ... The theory was correspondingly loose, and consequently

29

failed to provide an adequate solution to the projection problem ...During

the retrenchment period ...the focus of attention shifted from the construc-

tion of relative complex ...statements to the construction of a general theory

of grammar, restricted as to the devices it employed, which could be ascribed

to universal grammar.

Chomsky (1970) only discusses NPs, VPs and APs, not PPs. One goal of

Jackendoff (1977) is to bring PPs under the X-bar theoretic fold. So at the end of

the 1970s, a quite general picture of phrase structure had started to emerge. The

next section discusses Jackendoff's work.

2.2.2   Jackendoff (1977)'s extension of X-bar theory

The goal of Jackendoff (1977) is to provide an in depth study of phrase structure in

the spirit of Chomsky (1970) and Emonds (1976). Jackendoff develops a theory that

covers all lexical categories, including prepositions. Among others, Jackendoff ex-

tended Chomsky's insight concerning specifiers by emphasizing the parallels between

e.g., possessives in nominals and subjects in clauses. Technically, though, there are

many differences between the two theories. Whereas the basic X-bar structure in

Chomsky (1970) is a two-level representation (X", X' and X), Jackendoff suggests

that a three-level representation is necessary for both nouns and verbs (X"', X",

X' and X). I am not going to survey the details of Jackendoff's proposal since our

understanding of the data have changed a lot since then, and elements that were

specifiers at that time are no longer specifiers. See Jackendoff's own work and es-

pecially Stuurman (1985) for a critical review of his work. Rather, I would like to focus on certain core aspects of Jackendoff's theory, and here I will be drawing on the discussion in Stuurman (1985).

Jackendoff (1977: 103) makes a couple of interesting remarks concerning the study of specifiers that are worth reiterating here:

(14)   'There are problems in studying specifier systems that do not arise in studying complements. First, specifier systems involve very small numbers of lexical items and are riddled with idiosyncracies. Thus general phrase structure rules must be supported on the basis of impoverished and skewed surface distributions. [...] A second problem with specifier systems, at least in English, is that it appears much less possible to correlate semantic regularities with syntactic positions, as we did in complements. This may of course be a function of our ignorance about the semantics of deixis, quantification, and measuring; but it may also be a brute fact about English or about specifiers in general. In the absence of a coherent semantic theory of specifiers, I will make the latter assumption, hoping that a better understanding of the syntax may make possible a more disciplined approach to the semantics'.

Jackendoff (1977: 37) emphasizes that for him, there is no distinction between specifiers and complements: '...there is to my knowledge no evidence that either complements *or* specifiers function as constituents - they do not move or delete as units, and unlike normal constituents, no part can be designated as a head. Consequently, I will use the terms *specifier* and *complement* for expository

convenience only, with no theoretical significance implied'. This is different from Chomsky (1970), where there is a distinction between these positions. Stuurman (1985: 74) argues that this distinction acts as a constraint that prevents the child from inducing 'free constituent order' from pairs like the one in (15).[3]

(15)   a.   (she left) after - two days

       b.   (she left) two days - after

X-bar structure determines that *two days* should be a complement in (15a) and a specifier in (15b), Stuurman argues. If this were not the case, X-bar theory would not prevent the child from drawing the conclusion that (16b) should also be grammatical, given (16a) (Stuurman 1985: 75).

(16)   a.   (she cried) for - two days

       b.   *(she cried) two days - for

An unspoken premise in Stuurman's argument seems to be that only certain prepositions can take specifiers and that the X-bar schemas encode linear order. If such statements can be made, then one can derive the difference between these data sets. However, viewing this argument from a more modern perspective, it is not obvious why one cannot phrase the distinction in terms of movement: certain prepositions like *after* allow their complements to move, whereas other prepositions like *for* do

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[3]This point is similar to Lightfoot (1979: 54) who argues that on Jackendoff's view, 'it is not clear that the X-bar Convention offers any means of restricting possible phrase structure rules from which a particular grammar may draw'. See also Hornstein (1977) for arguments against Jackendoff's view.

not. If this can be done, it weakens Stuurman's criticism of Jackendoff. We will see in the next chapter that the phrase structure that I will develop actually shares with Jackendoff the view that specifiers and complements are not distinct.

2.2.3   A problem with the EST view

Before we move onto the early Principles and Parameters view on phrase structure, it may be worth considering a general problem that both Chomsky (1970) and Jackendoff (1977) face. The problem has been brought up most clearly by Stuurman (1985). Stuurman's goal is to defend what he calls 'the single projection-type hypothesis'. Multiple projection types, as assumed in Chomsky (1970) and Jackendoff (1977), are banned. Stuurman's thesis is that only one distinction is made internal to projections: the distinction between X^0 and X^1, or put differently, between a head and everything else. Stuurman argues that this provides a more restrictive phrase structure theory and a theory that is more easily learnable. Here is an example that he uses to make this claim.

In English, only the first hierarchical level projected from X^0 can dominate an NP. Stuurman takes the following contrast to show this, where (17b) is claimed to be bad.

(17)   a.   he [[met his wife] in Italy]

b.   *he [[met in Italy] his wife]

Stuurman (1985: 8) points out that if we assume multiple projection-types, the facts in (17) can easily be captured directly at the level of PS as follows:

(18)   a. $V^i \rightarrow \ldots V^j \ldots$, where $\ldots \neq$ NP, $\underline{i} > \underline{j} \geqslant 1$

      b. $V^1 \rightarrow \ldots V^0 \ldots$, where $\ldots =$ NP, $\ldots$

These restrictions are descriptively adequate, but as Stuurman stresses, they do not explain how a child can learn the distribution of NPs. Put differently, UG does not provide a rationale for why the constraints are the way they are: Why should UG not allow NP under V^i and exclude NP under V^1? Unless the rules in (18) are universal, children need access to negative data, which they by assumption do not have access to.[4]

    Stuurman presents a different analysis where there is only one projection type. His theory, which we will not flesh out here, allows for both the structure in (19) and (20)(Stuurman 1985: 9).

(19)

---
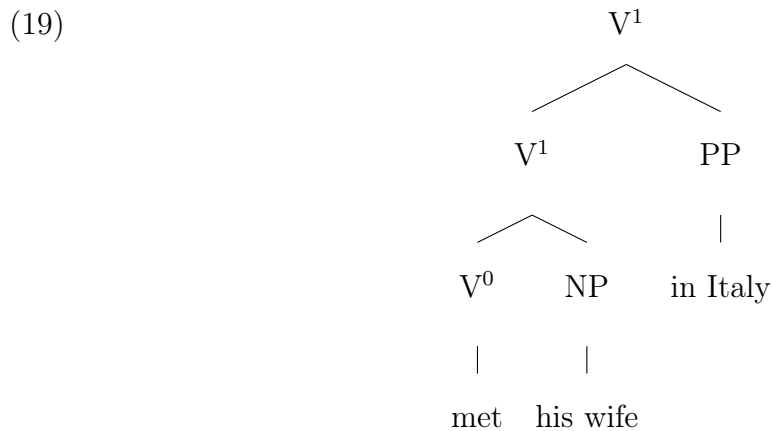
[4]See also Stowell (1981: 71-75) for criticism based on arguments from acquisition.

(20)

$$
\begin{array}{c}
V^1 \\
\diagup\diagdown \\
V^1 \qquad\quad NP \\
\diagup\diagdown \qquad\quad | \\
V^1 \quad PP \quad \text{his wife} \\
| \qquad | \\
V^0 \quad \text{in Italy} \\
| \\
\text{met}
\end{array}
$$
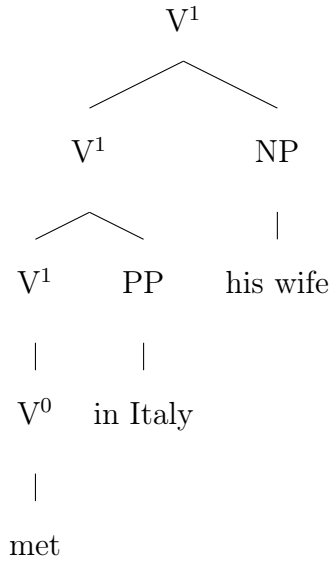
Here an independent principle that filters out the structure in (20) is required. This structure has an NP that is not dominated by the first X^1 up from X^0. Stuurman argues that this filtering condition can be associated with an adjacency condition on Case theory, following Stowell (1981). That is, being a Case assigner is a lexical property, thus a property of X^0, not of X^1. (20) is therefore ruled out independently of phrase structure rules, as in Stowell's work.[5] Stuurman presents additional arguments for why the single projection hypothesis is better than the more classic X-bar theory. The point is that the view emerging in the late 1970s had important flaws, as it was too flexible and not principled enough. As I will show in the next section, in the early 1980s, many of these flaws were addressed.

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[5]In fact, Stowell (1981) argued for the general elimination of phrase structure rules, thus providing empirical motivation for the formalization of Lasnik and Kupin (1977).

2.3 Government and Binding Theory

As research developed during the 1970s and 1980s, more and more of the elements that Chomsky and Jackendoff had analyzed as specifiers came to be analyzed as heads of particular functional projections (see also Abney (1987)). As Chametzky (2000) points out, a notion of a specifier emerged with the following characteristics: (i) typically an NP, (ii) it bears a certain relationship with the head. Stowell (1981: 70) summarizes the general characteristics of X-bar theory in the following way:

(21) Every phrase is endocentric.

(22) Specifiers appear at the XP-level; subcategorized complements appear within X'.

(23) The head always appears adjacent to one boundary of X'.

(24) The head term is one bar-level lower than the immediately dominating phrasal node.

(25) Only maximal projections may appear as non-head terms within a phrase.

These were then further developed during the Government and Binding era in the 1980s. Here I will focus on Chomsky (1986a), since that work presents the canonical version of X-bar theory.[6] However, I will also briefly discuss Fukui and Speas (1986) since that work has been quite influential and prepared the ground for future theories. Kayne (1994) will also be discussed as the representative of the last pre-minimalist theory of phrase structure. I will not discuss Speas (1990) in this section

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[6]For a critique of X-bar theory, see Pullum (1985) and Kornai and Pullum (1990).

since that work is closely related to Bare Phrase Structure, which will be discussed in the next main section.

2.3.1   Chomsky (1986a) and generalized X-bar theory

Chomsky (1986a) provides a generalization of X-bar structure (see also Chomsky (1989) for a clear summary), though attempts had already been made in Chomsky (1981), Stowell (1981), den Besten (1983), to mention the most important works. As we have seen, prior to *Barriers*, the maximal projections were VP, NP, AP and PP. In addition, there was S and $\bar{S}$, which got rewritten as shown in (26)-(27).

(26)   S → NP INFL VP

(27) $\bar{S}$ → COMP S

COMP includes at least C and *wh*-expressions. The problem is that S does not conform to X-bar theory. It is not endocentric since it has no head, which means that there is no projection line from a head to a maximal projection. S' is also not uniformly endocentric since when Comp is filled by phrasal material, it is not the head of S'. Because of these problems, Stowell (1981: chapter 6) suggests that the head of S is Infl, as illustrated in (28). This is very similar to Williams (1981b: 251) who suggests that S is headed by Tense.

(28)   IP

                                    ⋯   I   VP

Once IP replaces S, a natural next step is to reconsider S'. Stowell (1981: chapter 6) proposes that C is the head of S. The optional specifier then becomes the target of *wh*-movement. We have the structure in (29) (see also *Barriers*).

(29)   CP

                         ⋯   C   IP

With this in place, it is possible to formulate restrictions on movement based on what can appear in a head position and what can appear in a specifier position, cf. Travis (1984), Rizzi (1990).

The reanalysis of S and $\bar{S}$ paves the way for a generalization of X-bar theory. Chomsky (1986a: 3) proposes that X-bar theory has the general structure in (30), where X* stands for zero or more occurrences of some maximal projection and X = X^0.[7]

(30)   a. X' = X X"*

        b. X" = X"* X'

(Koizumi 1995: 137) argues that the traditional X-bar schema can then be seen as expressing three claims:

(31)   a. Asymmetry: A node is projected from only one of its daughters.

        b. Binarity: A node may have (at most) two daughters.

        c. Maximality: A head may project (at most) two non-minimal projections.

---

[7]This is what Chomsky said, but it is obviously not exactly what he meant. (30a) should read read X' = X Y"* because otherwise a verb, for example, can only take a VP complement, and similarly for (30b) and specifiers.

Asymmetry and Binarity give at most one complement. Maximality is required to ensure that there is only one specifier.

Chomsky (1986a: 4) points out that specifiers are optional whereas the choice of complements is determined by the Projection Principle. The latter is a principle that says that representations at each syntactic level are projected from the lexicon, cf. Chomsky (1981). That is, theta-relations have to be observed. Presumably the lexicon only contains rather general information of the sort that a verb requires an external and/or an internal theta-role; it does not say that a specifier or a complement is needed. That is something that the grammar determines based on the external/internal distinction. Furthermore, Chomsky stresses that just as notions like subject and object, specifiers and complements are relational and not categorial notions (Chomsky (1986a: 3); see already Chomsky (1965: 68) and also George (1980: 17), Muysken (1982)).

This discrepancy between specifiers and complements is important to the general issue that I am concerned with in this dissertation. If specifiers are optional, that has implications for how we conceive of external arguments. Chomsky explicitly says that only the choice of complements is determined by theta roles. If so, then that essentially removes the external argument from the theta grid on the verb, since specifiers are optional. This is very important for the discussion in chapter 3, where I will take issue with the claim that theta roles constraint even the choice of what Chomsky refers to as complements.

2.3.2 Fukui and Speas (1986) and differences between lexical and functional heads

Following up on the theory in Chomsky (1986a), many researchers developed somewhat different versions of X-bar theory. Fukui and Speas (1986) claim that there are significant differences between lexical and functional projections, e.g., between VP and IP. They argue that lexical categories may iterate specifiers as long as all these positions are fully licensed and can be interpreted at LF.[8] Functional categories, on the other hand, only have one unique specifier position (see also Stuurman (1985: 182) for a similar claim, though Stuurman claims that this also holds for lexical categories). Fukui and Speas also argue that specifiers of functional categories close off projections, so that the node dominating the maximal projection should be XP. For lexical projections, the node should be X', since iteration has no limit in this case.

The following seven observations motivate their proposal.

(32)   Functional heads have one and only one (i.e., non-iterable) specifier, while the specifiers of lexical heads may be iterable ones.

(33)   The specifiers of functional heads are often (in [their] model, always [...]) moved from within their complement.

(34)   All functional heads have specifier positions; it is not at all clear that all lexical heads have Spec positions.

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[8]Fukui and Speas do not elaborate on what all the relevant licensing principles are.

(35) Languages which lack functional heads also lack specifier positions.

(36) Functional heads are special in that they are closed-class items.

(37) Functional heads lack the sort of semantic value associated with lexical categories.

(38) Functional heads always select a unique complement.

I will not go through these in detail, but rather focus on certain cross-linguistic differences that such an analysis can capture.

Fukui and Speas point out that data such as (39-(43) are ruled out if there's only one specifier position. It may seem a bit strange that this is true of (39) too, but this must be on the view where determiners are specifiers of N'.

(39) *the the old man

(40) *yesterday's Chomsky's book

(41) *It Mary ate a bagel

(42) *the John's cat

(43) *What who did buy?

However, as they go on to point out, X-bar theory as developed in Chomsky (1986a) does not provide such a restriction as any number of specifiers is allowed for every category. They argue that X-bar theory itself should provide this restriction, and they also use their theory to account for differences between languages like English and languages like Japanese (see also Farmer (1980), Hale (1980) for earlier attempts to analyze differences between these language in terms of the phrase structure com-

ponent). Fukui and Speas and also Fukui (1986) argue that Japanese lacks certain functional categories, namely Det, Infl and Comp. This means that Japanese is predicted to allow structures similar to the ones in (39)-(43) that English disallows. The following data indicate that the prediction is borne out.[9]

(44) John-no   ko-no   hon
     John-GEN this-GEN book
     lit. 'John's this book.' (Fukui and Speas 1986)

(45) John-no   a-no   kuruma
     John-GEN that-GEN car
     lit. 'John's that car.' (Fukui 1986: 202)

Both Fukui and Speas (1986) and Fukui (1986) provide a lot of empirical evidence in favor of their proposal. Put differently, for Fukui and Speas, by revising and parametrizing the phrase structure component, one can give comparative analyses of such apparently different languages as English and Japanese.

Fukui and Speas (1986)'s theory is one of the most articulate theories that assume that a split between lexical and functional categories is encoded in the phrase structure component, e.g., by way of allowing different numbers of specifiers. Certain parts of Fukui and Speas' theory recurs in more modern theories as well. In the next sub-section, we will look briefly at Kayne (1994) before we turn to the minimalist conception of phrase structure: Bare Phrase Structure.

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[9]Fukui and Speas do not say anything about why English does not allow iteration of specifiers to lexical categories. Presumably such iteration is ruled out because the specifiers won't be fully licensed, but again, they do not spell out what fully licensed means, as pointed out in the previous footnote.

2.3.3 Hoekstra (1991) and the elimination of specifiers

Hoekstra (1991) argues that specifiers are not defined in X-bar theory. As he puts it, 'Standard X-bar theory stipulates a cross-categorial distinction between specifiers and complements' Hoekstra (1991: 9). Since specifiers are stipulated, Hoekstra claims that they should not be defined. He contextualizes his proposal by referring to Stowell (1981) and Stuurman (1985). Stowell's minimalization of X-bar theory only affects the horizontal dimension and he specifically excludes the vertical dimension (Stowell 1981: 92). Stuurman, as we have seen above, argues that the vertical dimension also can be reduced and that a two-level X-bar theory can be replaced with a one-level X-bar theory. Hoekstra follows both Stuurman and Stowell in reducing the vertical and horizontal dimension, and consequently ends up eliminating specifiers.

Rather, Hoekstra argues, specifiers should be defined through agreement: a specifier always agrees with its head. He presents a conceptual redundancy argument for this (Hoekstra 1991: 23). He claims that a two-level X-bar theory can define specifiers in two ways. One way is by saying that a specifier is the maximal projection that is sister to a one-bar projection. The other way is to say that a specifier takes part in Spec-Head agreement. The conceptual redundancy here is rather obvious, so Hoekstra claims that agreement, and the concomitant view of specifiers, is indispensable. Thus the X-bar theoretic characterization of specifiers should be dropped.

A one-level X-bar theory looks as follows (Hoekstra 1991: 24):

(46)   XP → YP XP

(47)   XP → ZP X

Within such a one-level theory, it may seem impossible to distinguish specifiers from adjuncts. Hoekstra argues that this is not the case because specifiers are defined by virtue of entering into Spec-head agreement. (Hoekstra 1991: 24) defines specifiers as in (48).

(48)   A specifier is an adjunct which agrees with a head.[10]

As Hoekstra (1991: 28) argues, categorial restrictions on specifiers follow from the nature of the type of agreement that is involved. This differentiates the specifier of IP and the specifier of CP.

This way of defining specifiers entails that the definition does not hinge on the difference between minimal and maximal projections: 'Thus it is possible for a specifier to be a head' Hoekstra (1994: 163). I will not discuss this further here since we will return to the issue when discussing Starke (2004) below.

2.3.4   Kayne (1994) and the assimilation of specifiers and adjuncts

Kayne (1994) puts forward a novel theory of phrase structure. He suggests there is one universal order and that this order is as in (49), where > means *precedes*.

(49)   specifier > head > complement

---

[10]On this view, adjectives are specifiers since they agree with the nominal head in many languages.

Throughout the history of Chomskyan generative grammar, it had generally been an assumption that languages vary in their base structure. Phrase structure rules encode this directly as in (50) for an English VP and (51) for a Japanese VP.

(50)   VP → V NP

(51)   VP → NP V

When Principles and Parameters Theory emerged, phrase structure rules were eliminated (Stowell 1981, Travis 1984) and instead a head parameter was suggested where there is basically a binary choice between a head-final and a head-initial structure (Chomsky 1986b). But everyone assumed that this parameter is part of the syntax (until Chomsky (1995c) who explicitly argues against this), so again, the syntactic base structure might be different from one I-language to another I-language. Kayne (1994) argues that this is the wrong picture and that linear and hierarchical order are much more tightly connected. The quote in (52) summarizes Kayne's position very well:

(52)   'From this perspective, linear order turns out to be more fundamental to syntax than is normally thought. As a result of the Linear Correspondence Axiom (LCA), the property of antisymmetry that a linear ordering has is inherited by the hierarchical structure. I have argued that this is behind X-bar theory, or rather, that X-bar theory, although largely accurate in its standard form, should not be considered to be a primitive part of syntactic theory (i.e., of UG). What is primitive in UG is the LCA, from which follow familiar X-bar-theoretic properties such as (1) the need for a phrase to have

a head, (2) the impossibility for a phrase to have more than one head, (3) the limitation to one specifier per phrase, (4) the limitation to one sister complement per head, and (5) the requirement that a complement not be a bare head' (Kayne 1994:131).

As the quote explains, the LCA is the basic property of phrase structure. The axiom is stated in (53).

(53)   *Linear Correspondence Axiom*

d(A) is a linear ordering of T (Kayne 1994: 6).

The nonterminal-to-terminal dominance relation is represented by d. This relation d is a many-to-many mapping from nonterminals to terminals. For a given nonterminal X, d(X) is the set of terminals that X dominates. A is the set of ordered pairs <X$_j$, Y$_j$> such that for each j, X$_j$ asymmetrically c-commands Y$_j$. A contains all pairs of nonterminals such that the first asymmetrically c-commands the second, thus it is a maximal set. T stands for the set of terminals.

One aspect of Kayne's theory that doesn't come through in the above quote is that adjunction is always to the left. Kayne also argues that specifiers are an instance of adjunction. Thus specifiers will also always be to the left.

The theory of phrase structure in Kayne (1994) is the last one that emerged before a new theory was suggested within the Minimalist Program. Although Chomsky's theory of Bare Phrase Structure does make some use of Kayne's linearization algorithm, we will see that many of the other specifics will not be retained. In chapter 3, I will return to Kayne's proposal concerning specifiers and adjuncts and argue

that we can put this to good use within an even barer theory of phrase structure.

2.4   The Minimalist Program

With the development of the Minimalist Program, Chomsky also developed a new theory of phrase structure. This theory was argued to be a reduction of X-bar theory in that the theory does not rely on bar levels at all. In this section, I will discuss the details of Bare Phrase Structure and also discuss certain limitations concerning specifiers. These limitations will lead me to consider a couple of theories that explicitly or implicitly suggest we eliminate the relational distinction between specifiers and complements.

2.4.1   Bare Phrase Structure

Chomsky summarizes the gist of Bare Phrase Structure in the following quote: 'Minimal and maximal projections must be determined from the structure in which they appear without any specific marking; as proposed by Muysken (1982) they are relational properties of categories, not inherent to them' (Chomsky 1995a: 61). Chomsky (1995c: 242) also relates this to the Inclusiveness Condition, which bans any marking of maximal and minimal projections. This way of looking at things is closely related to Speas (1990: 35): 'What I will propose is that bar level is not a primitive of the grammar at all; rather 'maximal projection' and 'minimal projection' are defined terms, and intermediate projections are simply the elsewhere

case'.[11] Another way to put this is to say that there is really nothing categorically special about being a specifier or a complement in the grammar - these are just different relational properties that a phrase can have in relation to other elements.[12] In this sense, specifier and complement are more like the notions 'subject' and 'object'. However, there are still reasons to distinguish specifiers and complements, as specifiers are landing sites for movement, they introduce external arguments, they are subject to EPP properties, and so on and so forth. As we will see below, traditional Bare Phrase Structure maintains an important distinction between specifiers and complements.

Travis (1984) already suggested that intermediate projections are not targeted in the syntax. Speas follows Travis in making this claim and below I will consider some data that bear on this issue.

Another way to put this is to say that phrase structure is built solely of lexical items. No 'extrinsic' marking is necessary: Bar levels are not properties of phrases but mark relations between lexical items. This means that instead of a phrase like (54), we have a phrase like (55). Here I'm setting aside how verbs are inflected and where the arguments really belong in the structure - the important point is the difference between the two structures.

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[11]It is not exactly clear what makes intermediate projections 'invisible'. More on this below.

[12]There may still be differences at the interfaces, e.g., concerning how something in a specifier is interpreted as opposed to a complement.

(54)

```
                    VP
                   /  \
                 DP    V'
                  |   /  \
                John V    DP
                     |     |
                  kicked  balls
```

(55)

```
                 kicked
                 /    \
              John    kicked
                      /    \
                  kicked   balls
```
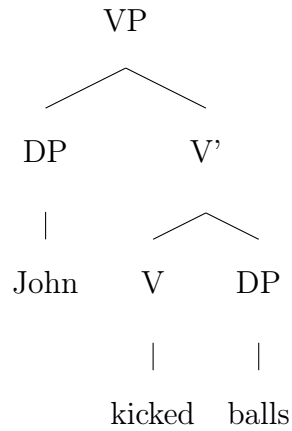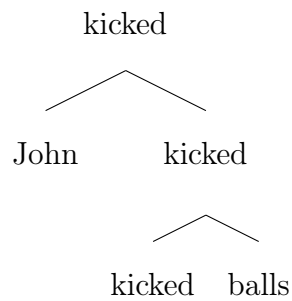
The lexical items *John*, *kicked* and *balls* are accessed at the LF interface. No units apart from the lexical items can be part of the computation. Thus bar-levels are 'invisible' both during the computation and by assumption at the interface. In short; bar-levels have no existence within Bare Phrase Structure. It should be pointed out, though, that it is not exactly clear what makes the highest and lowest instances of *kicked* visible while excluding the middle one. The topmost one has to be there to mark that something is a phrase and possible provide the label for further computation (as argued in Hornstein (2009)), and the lowest one is the head. The middle instance does not serve a purpose, but the theory is less clear on how this is formally ensured.

Travis (1984) considers *one*-substitution in detail since *one*-substitution has been one of the main arguments in favor of bar-levels. The traditional contrast is

given in (56)-(57).

(56)   I saw the student from Stuttgart and the one from Berlin.

(57)   *I met the student of physics and the one of literature.

However, some *of*-complements do allow being left behind in pronominalization, as
Travis (1984: 80) points out (pace Jackendoff (1977)).

(58)   I saw a picture of Debbie in the living room and one of Konrad in the dining
        room.

The contrast between (57) and (58) is not expected. Travis points out that there
appears to be two types of *of*-phrases corresponding to this contrast. She argues that
complements that are thematically dependent (referring to Higginbotham (1983)
and Rappaport (1983)) on a head noun cannot be left behind whereas complements
that are thematically independent can. She mentions that Hornstein and Lightfoot
(1981) differentiate (59) and (60) by arguing that the former denotes two properties
(being a student and having long hair) while the second denotes one property (being
a student of physics).[13]

(59)   a student with long hair

---

[13]It is not clear what a property is. Furthermore, there is an empirical problem, as Barry Schein
(p.c.) points out since (i) is not well-formed.

(i)   *the picture of Julia's and the one of John's.

I set this problem aside since it does not matter for the main point I am trying to make, which is
that there is a contrast here, as reported in the main text, that challenges the traditional account
of *one*-substitution.

(60)   a student of physics

Travis (1984: 83) then notes that the type of PPs that can occur with *one* are of the first type. The facts for *of NP* phrases pattern the same way:[14]

(61)   the picture of Julia and the one of Suzanne

(62)   This picture is of Julia.

(63)   *the student of physics and the one of chemistry

(64)   *This student is of physics.

Speas (1990: 42) argues, based on Travis' arguments, that *one* should be treated as a pronominal projection (and that this also holds for *do so* in the verbal domain). One can then say that thematically independent complements may be sisters of *one*. Whatever the ultimate explanation turns out to be, the important point is that these arguments militate against letting *one*-substitution play a crucial role in defining phrase structure (see also Kayne (2009), who implicitly makes the same claim). Once we assume the DP hypothesis (see e.g., Abney (1987)), the need for N bars also disappear.

Going back to Chomsky's discussion of Bare Phrase Structure, he also provides definitions of specifiers and complements. The following quote provides essentially

---

[14]There are complicating empirical issues here. For (59), the data go in different directions:

(i)   the student with long hair and the one with short hair

(ii)   *This student is with long hair.

Travis does not discuss these data. She only says that two properties go together with *one*, so even if the copula case is bad, that could be due to something else.

51

what he has to say about this issue:

(65)   The terms "complement" and "specifier" can be defined in the usual way
        [...]. The head-complement relation is the 'most local' relation of an XP to
        a terminal head Y, all others within YP being head-specifier (apart from ad-
        junction [...]); in principle there might be a series of specifiers, a possibility
        that seems to be realized [...]. The principles of UG, we assume, crucially
        involve these local relations. (Chomsky (1995a: 63), Chomsky (1995c: 245))

Let us first focus on the last part of this quote, namely that multiple specifiers come
for free in Bare Phrase Structure, unless you explicitly restrict the theory so that
they cannot occur. I will now show why multiple specifiers exist without further
ado once we make explicit what we think about Merge and labeling (see also Speas
(1990)). The following proof is based on Adger et al. (1999).

Chomsky (1995c: 243) argues that Merge applies to two objects α and β
and then forms the new object K. K includes both the formed set $\{\alpha, \beta\}$ and its
label γ: $\{\gamma, \{\alpha, \beta\}\}$. Given this definition of Merge, a term with its own internal
structure can freely merge with another term with internal structure. One of these
will determine the label, and we get a specifier. (66) shows this.

(66)   Merge ({x, {x, y}}, {m, {m, n}}) = {m, {{x, {x, y}}, {m, {m, n}}}}

Now, crucially nothing bans the reapplication of this operation.

(67)   Merge ({a, {a, b}}, {m, {{x, {x, y}}, {m, {m, n}}}})

        = {m, {{a, {a, b}}, {m, {{x, {x, y}}, {m, {m, n}}}}}}

Now we have two specifiers: x and a, and m is the head/label. This set-theoretic

notation can be rendered in a tree as follows:

(68)

```
                              m
                            /   \
                           a     m
                          / \   / \
                         a   b x   m
                              / \   / \
                             x   y m   n
```
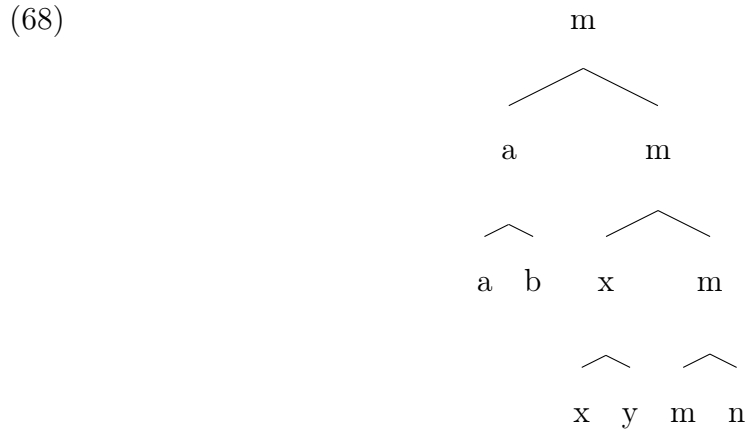
This is a solid argument and it means that when specifiers are relational, there can be no ban as such on multiple specifiers, unless one stipulates such a ban. It furthermore raises the question why languages appear to be different in whether or not they allow multiple phrases to merge with the same head. The definition of Merge we have adopted allows this computation, as we have just seen, and then it appears that some languages have restrictions on how many they allow. There is an important question of how to encode this parametrization. Is it a property of the relevant head that it allows one, two or three specifiers? How does a child learn how many specifiers each head allows? These are non-trivial questions, but I am not going to discuss them in detail here. The theory that I will pursue in the present thesis will not make it possible to generate an object where multiple phrases have been merged with the same head.

In addition to this argument, there is also a lot of empirical evidence in favor of multiple specifiers. I will now give some of the evidence that has been put forward in the literature.

Kuno (1973) presents data from Japanese that shows multiple subject con-

structures. A few examples are provided in (69)-(71).

(69) Bunmeekoku-ga   dansee-ga hcekin-zyumyoo-ga   nagai
     civilized.country-NOM male-NOM average.life.span-NOM long
     'It is in civilized countries that men - their average life-span is short.'

     ('It is the average life-span of civilized countries that is long.')

     (Koizumi (1995: 160), from Kuno (1973: 70))

(70) mary-ga   kami-ga   nagai (koto)
     Mary-NOM hair-NOM long   (fact)
     'Mary has long hair.'

(71) yoi   otya-ga   nihonzin-ga   kononde nomu (koto)
     good green.tea-NOM Japanese-NOM enjoying drink (fact)
     'Good green tea, Japanese people drink [it] with pleasure.'

     (Doron and Heycock 1999: 70)

Japanese is not the only language that has multiple subject constructions. Doron

and Heycock (1999) argue that both Modern Standard Arabic and Modern Hebrew

have such constructions. They provide the examples in (72) for Arabic and (73) for

Hebrew.

(72) a. hind-un   yuqa:bilu-ha T-Tulla:b-u
         Hind-NOM meet-her   the-students-NOM
         'The students are meeting Hind.'

         (Lit.: 'Hind, the students are meeting her.')

      b. ?al-bayt-u   ?alwa:n-u-hu   za:hiyat-un
         the-house-NOM colors-NOM-its bright-*nom*
         'The house has bright colors.' (Lit.: 'The house, its colors are bright.')

         (Doron and Heycock 1999: 70)

(73) a. ruti yeS   la   savlanut
         Ruti there.is to.her patience

'Ruti has patience.'

    b. ruti sof-a   le-naceax
          Ruti end-hers to-win
          'Ruti will end up winning.' (Doron and Heycock 1999: 71)

Doron and Heycock present several arguments that the initial noun phrase in these sentences should not be analyzed either as a dislocated phrase or in a designated focus position, which are the standard analyses of these sentences in Semitic and Japanese, respectively. They argue instead that the noun phrase is a subject that combines with what they call a 'sentential predicate', which is a phrase that semantically denotes a property even if syntactically, it is a full clause that already has a subject. I am not going to review their arguments here; see their paper for all the details. Suffice it to say that multiple subject constructions do not seem to be specific to Japanese, though even if they were, they still provide empirical evidence for the existence of such constructions.

There is a complicating factor that it is worth highlighting, especially since it involves an issue that the literature seldom engages with. How can we be sure that multiple *subjects* are equivalent to multiple *specifiers*? An alternative would be that these subjects are specifiers of each of their functional heads, and that these functional heads are silent so that we wouldn't be able to tell that these heads were present. Extensionally we would get the same result, but intensionally the computation would be different.[15]

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[15]Koizumi (1995) attempts to present a possible argument in favor of the existence of multiple specifiers and against silent heads. However, upon further scrutiny it turns out that the crucial contrast he relies on does not exist in English. Therefore I am not going to present the discussion

Before I go into problems with specifiers and how they affect our understanding of phrase structure, I would like to step back and reflect briefly on the results of Bare Phrase Structure. Consider the following quote.

(74) If the reasoning sketched so far is correct, phrase structure theory is essentially "given" on grounds of virtual conceptual necessity in the sense indicated earlier. The structures stipulated in earlier versions are either missing or reformulated in elementary terms satisfying minimalist conditions, with no objects beyond lexical features. Stipulated conventions are derived. Substitution and adjunction are straightforward. At least one goal of the Minimalist Program seems to be within reach: phrase structure theory can be eliminated entirely, it seems, on the basis of the most elementary assumptions. If so, at least this aspect of human language is "perfect" [...]' (Chomsky 1995c: 249).

Bare Phrase Structure provides a reduction of X-bar structure and paves the way towards the elimination of the phrase structure component. This is a very important result from the perspective of this dissertation: If phrase structure theory can be eliminated entirely, we want to understand exactly how that can happen. I will argue that eliminating the relational difference between complement and specifiers is one further step towards this goal, with the added benefit of providing a transparent mapping onto logical forms that exhibit full thematic separation. If specifiers qua specifiers do not play an important role for argument structure, then we have to

here.

consider whether there are other empirical arguments in favor of them. The rest of the dissertation will argue that there are no such arguments.

In many ways, Bare Phrase Structure represents the natural continuation of the path that was initiated by Chomsky in *Syntactic Structures*. Here he had to formulate a number of phrase structure rules and order them. Later he developed X-bar theory as a way of generalizing over phrase structure rules. X-bar theory was further streamlined in *Barriers* and then The Minimalist Program provides a further reduction while preserving empirical coverage. I think there are reasons to say that Bare Phrase Structure constitutes one of the genuine success stories of Minimalism. It does exactly what Minimalism was supposed to do, namely take a theoretically and empirically well-understood construct and show us that we can understand it even better by reducing the ontology. I would submit that there are not many such success stories within Minimalism, but Bare Phrase Structure seems like a solid candidate.[16] However, even Bare Phrase Structure is not free of problems, and in what follows, I will probe Bare Phrase Structure further to illustrate where there is still room for improvement. I will then in chapter 4 show how we can move further towards reducing Bare Phrase Structure even further, by removing the relational difference between specifiers and complements.

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[16]For example, we do not seem to have increased our theoretical understanding of islands during the past 20 years. Islands appear to be just as much of a problem now as they have always been.

2.4.2 Remaining problems with specifiers

There are two types of issues that we need to separate here, namely (i) how easy or hard it is to provide an adequate definition of a specifier, and (ii) whether the grammar actually distinguishes between specifiers and complements. I will show that a specifier can be defined, but it comes at the cost of admitting X-bar levels into the theory again. In chapter 4, I will argue that the grammar does not distinguish between specifiers and complements, and that this has the virtue of providing a transparent mapping from syntactic structure onto Neo-Davidsonian logical forms.[17]

Let us for now concentrate on how specifiers can be defined.[18] As we saw above, Chomsky (1995c) basically defines specifiers as maximal projections that are not complements or adjuncts. For ease of exposition, here is what he says about these relations again:

(75)   The terms "complement" and "specifier" can be defined in the usual way

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[17]See Adger (In press) for a different critique of specifiers and different solutions.

[18]This was already discussed by van Riemsdijk (1998: 3) when he says:

(i)   With further multiplication of functional heads, the number of specifiers is multiplied as well. In many cases it is not clear what role these specifiers play, if any. Another way of putting this is to say that the definition of 'specifier' was never entirely clear in that, for example, it subsumed such categorially and otherwise diverse elements as articles, quantifiers, modifiers, subjects, etc., and while in more recent work heads have been more or less successfully separated from XPs, the confusion remains with respect to the status of negation, adverbs and the like [. . .].

[. . .]. The head-complement relation is the 'most local' relation of an XP to a terminal head Y, all others within YP being head-specifier (apart from adjunction [. . .]); in principle there might be a series of specifiers, a possibility that seems to be realized [. . .]. The principles of UG, we assume, crucially involve these local relations. (Chomsky (1995a: 63), Chomsky (1995c: 245))

We also saw that this allows for multiple specifiers. However, as I have already mentioned, there are properties that suggest that the grammar makes use of a 'true' or distinct specifier position. The EPP is one such property, namely that there seems to be a unique 'subject' position that has to be filled Chomsky (1982). We have already seen an example motivating this, repeated in (76):

(76)   (*It) is raining.

Note that the element in the EPP position cannot be an adjunct:

(77)   *Yesterday was raining.

In these cases, an expletive is required:

(78)   Yesterday, there was rain.

Semantically, there has also been the intuition that the EPP is related to 'subjecthood' and predication, an approach that in particular was developed in Rothstein (1983).

Let us return to the issue of defining specifiers. Chomsky (1995c)'s definition is problematic because it is tricky to define specifiers as the 'elsewhere' case since he also assumes that labels exist. Labels are copies of lexical items, and if so, they will

also be included in the 'elsewhere' case. Thus 'elsewhere' will include both specifiers and labels (aka. lexical items), and then we are left with the question of how to distinguish these. There is also the possibility that adjuncts and specifiers are very similar if not identical in certain ways (Kayne 1994). One could maybe get around this problem by denying the existence of labels (Collins 2002, Seely 2006), but there are also good reasons for assuming that labels exist (Hornstein 2009).

Chomsky (2010) asks the following question: In (79), why do we not say that T is the specifier of D_2?

(79)

$$
\begin{array}{c}
\text{T} \\
\diagup\diagdown \\
\text{D}_2 \quad \text{T} \\
\diagup\diagdown \\
\text{T} \quad \text{D}_1
\end{array}
$$

Typically we say that D_2 is the specifier of T, but Chomsky's way of defining specifiers within Bare Phrase Structure does not rule out the latter option. D_2 is a specifier of T, and T is a specifier of D_2 since it is only the complement relation between T and D_1 that is explicitly defined in the definition above. Every other relation is a head-specifier relation, and assuming that labels exist, they can function as specifiers as well.

A definition based on c-command may at first glance seem to provide an answer to Chomsky's question. That presupposes that the c-command algorithm correctly identifies what the head is. We need a definition of c-command, and a definition of complements and specifiers in terms of c-command is given in (80).

(80)   'The complement position is that which uniquely stands in a mutual C-command relation with the verb. The Specifier position is that which stands in a unique asymmetrical C-command relation to the verb (viz. it asymmetrically C-commands the verb). These, then, are the positions which are closest to the verb in ways that are straightforwardly definable in terms of C-command relations' (Chametzky 2000: 136).

Now, consider a structure with a T head above the verb:

(81)

$$
\begin{array}{c}
\text{T} \\
\diagup \diagdown \\
\text{T} \quad \text{V} \\
\diagup \diagdown \\
\text{D}_2 \quad \text{V} \\
\diagup \diagdown \\
\text{V} \quad \text{D}_1
\end{array}
$$
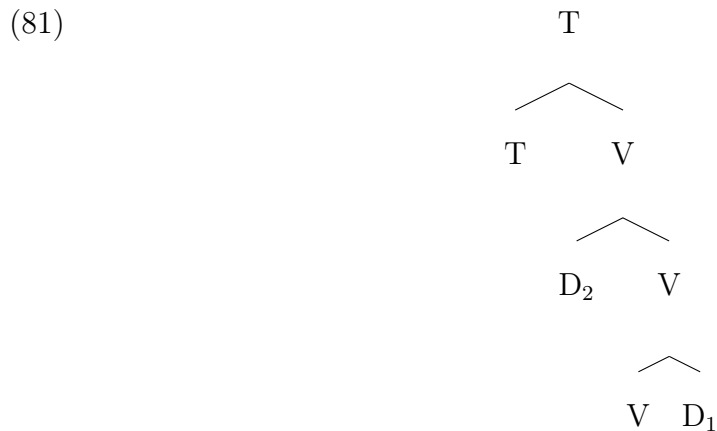
The T head asymmetrically c-commands the verb, but we don't want to say that T is a specifier (pace George (1980: 27)). One could probably get around this problem by saying that c-command only holds internally to every phrase.[19]. However, it is not clear how you determine what is a phrase without reference to the head that merges with the phrase. More importantly, binding conditions on variables show that c-command holds across phrases.

A definition where complements are first-merged and specifiers are later-merged does not suffice, since later-merged does not single out designated specifiers that ap-

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[19]This would be similar to saying that every phrase constitutes its own Spell-Out domain (see e.g., Epstein and Seely (2002), Müller (2010)).

pear to be necessary for the EPP in English. It also makes it hard to distinguish between specifiers that are externally merged and specifiers that are internally merged.

Collins and Stabler (2011) provide the following definitions of complements and specifiers:

(82) Y is the *complement* of X in C iff C = Merge(X,Y) and X is a lexical item token.

(83) Y is the *specifier* of X in C iff C = Merge(X,Y) where X is not a lexical item token. When LI = Label(X), we also say Y is the *specifier* of LI in C.

Two other definitions that are needed are the following ones:

(84) For all C, C is a *minimal projection* iff C is a lexical item token.

(85) A *lexical item token* is a pair <LI,k> where LI is a lexical item and k an integer.

Put in more conventional terms, a lexical item is an item taken out of the lexicon. These definitions show that specifiers can easily be defined, but however, note that X in (83) is defined as 'not a lexical item token'. That is, it is something else than a lexical item. What is it? We are only told that it is not a lexical item token. This seems reminiscent of the elsewhere case that Chomsky made use of, and Collins and Stabler also provide a definition of an intermediate projection:

(86) For all C, D syntactic objects in workspace W, LI is a lexical item token, C is an *intermediate projection* of LI iff Label(C) = LI, and C is neither a minimal projection nor a maximal projection in W.

It is hard to see how this is not just recoding X-bars, though as long as these are intended as 'informal notions' (Chomsky 1995a: 61), the definition as such is unproblematic. Collins and Stabler show that we can certainly provide definitions that distinguish specifiers and complements. The remaining question is whether there is evidence that the computation of syntax requires these definitions. The remainder of this chapter and the beginning of chapter 4 will discuss that question.

There are various proposals in the literature where it is argued that specifiers should be eliminated, cf. Cormack (1999), Starke (2004), Jayaseelan (2008b), Chomsky (2010); see also Chomsky (2004: 111-112). In the next section I will in particular discuss Starke's approach and also a recent approach by Narita (2011). The latter does not try to eliminate specifiers as such, but his proposals are interestingly relevant for what I will be suggesting in chapter 4.

2.4.3   No specifiers

There have been attempts at eliminating specifiers, as we already saw when discussing Hoekstra (1991). The most explicit attempt is the one in Starke (2004). Cormack (1999) makes a similar suggestion within Categorial Grammar, but I am not going to discuss that here. I will also not discuss Jayaseelan (2008b) since he bases his approach on Starke's, and furthermore because he assumes that Merge is asymmetric and that dominance/precedence is the main syntactic relationship. As I have made clear in chapter 1, I assume that Merge is symmetric. And Jayaseelan's specific proposal hinges very much on these assumptions together with Starke's

work, which is to say that the technical details of Jayaseelan's account won't play a major role in what follows. After discussing Starke, I will go on to discuss a proposal by Narita (2011) that in part ends up getting rid of specifiers.

2.4.3.1   Starke (2004)

Starke (2004) argues that specifiers should be eliminated. He specifically focuses on questions and argues that there is no need to have an empty C head. That is, he argues that the structure in (88) should be replaced with the structure in (89) (Starke 2004: 252).

(87)   I wonder which pasta these boys ate.

(88)

(89)
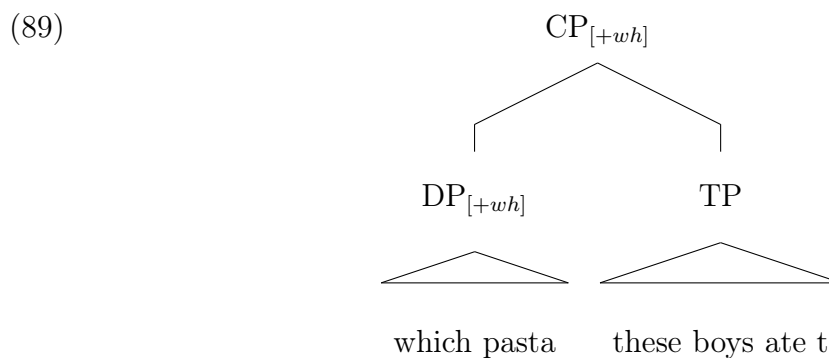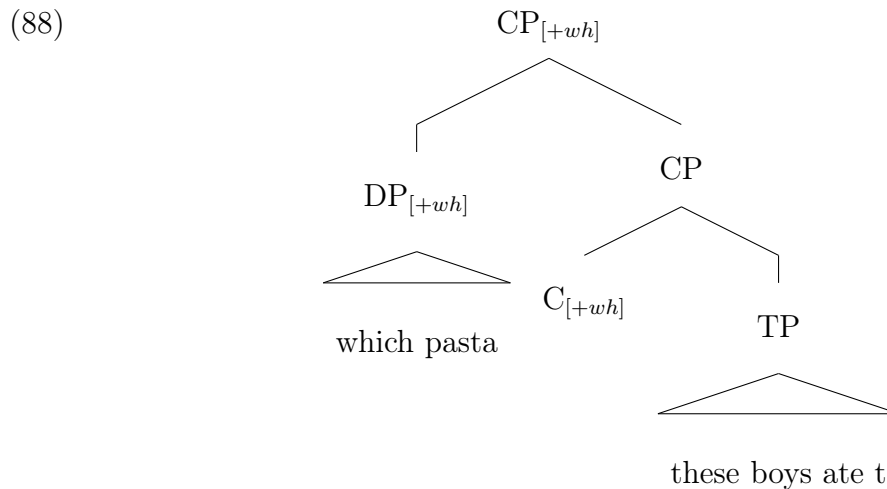
Starke notes that specifiers are a way of "adding space". However, as cartography emerged (Pollock 1989, Rizzi 1997, Cinque 1999), there's as much space as you can ask for (cf. already Stuurman (1985: 183)). Specifiers agree with heads, so they contain the same features as heads do, which is shown in the structure. Concerning the *wh*-phrase DP, (Starke 2004: 253) says that 'The "specifier" has now taken over the role of the head [in (89)], it has become a complex, non-terminal head'. Unfortunately, it is not clear what a 'complex, non-terminal head' is. When you remove the C head, you do not seem to have a specifier. Heads, however, are usually not complex in this way either. This issue is related to another issue, namely how the CP emerges in Starke's structure. Starke does not elaborate on that, but presumably this is due to the *wh*-feature that he puts on both the DP and the CP. One has to think that this feature fulfills endocentricity, but exactly how Starke imagines that this works remains unclear. In order to achieve that the feature somehow captures endocentricity, quite a bit of feature percolation seems to be required. It is also not clear how it works in those cases where the moving element does not bear a *wh*-feature, as in topicalizations. It is hard to see what will project in such constructions, and Starke does not address the question in the paper.

Yet a further problem is that the structure in (89) is incompatible with the proposals in Moro (2000), Chomsky (2008) and Kayne (2010) that [XP YP] structures are not allowed for purposes of linearization. I will return to Moro's suggestion in detail in chapter 4, but insofar as this is correct, Starke's approach is problematic.

Setting these issues aside for now, Starke makes a point that the present thesis is concerned with, namely why one would want to eliminate specifiers. A relevant

quote is given in (90).

(90) 'Eliminating the notion "specifier" carries us one step further toward the
      reductionist program initiated by minimalism: minimalism eliminated the
      looser notion of government in favor of the more restricted notions of specifier-
      head relations. This chapter amounts to eliminating specifier-head rela-
      tions also and restricting all syntactic relations to the most basic: head-
      complement relations' (Starke 2004: 253).

I think this is a valid and important point. Jayaseelan (2008b: 104) further argues
that if we get rid of specifiers, Merge will be maximally simple. I won't give his
argument here since it is rather complex. Rather, I will give Starke's reasons for
dispensing with specifiers. I am just going to list them here and I refer the reader
to Starke's paper for further arguments.

(91) Doubly Filled Nothing: no projection can have both its head-terminal and
      its specifier present at the same time.

(92) Starke asks why merger of an XP specifier has to be preceded by insertion
      of a corresponding head. He says that currently there are no answers to this
      question, though he does not consider possibilities such as the Extension
      Condition or Greed.

(93) The specifier relation is similar to an 'expletive' relation: it maps onto a
      semantically vacuous identity relationship and plays no role in labeling.

(94) Locality of specifier-head is very different from the locality of e.g., *wh*-
      movement, but this should not be the case since both types of locality involve

featural identity.

(95)   Features are duplicated since they are present on both the head and the specifier. (See also Hoekstra (1991).)

(96)   Phrase structure is split into two hierarchies: first nodes are assembled into X-bar structures and then these are assembled into a rigid sequence of projections.

Starke argues that a way to remedy these problems is to make explicit an assumption that 'all modern theories of syntax assume', namely that projections are ordered. He describes this as in (97) (Starke 2004: 256).

(97)   There exists an 'fseq' - a sequence of functional projections - such that the output of merge must respect fseq.

Insertion of structure is triggered directly by fseq, which means that an fseq cannot be <C, V> but has to be <C, T, V>. Starke argues that 'the beauty of this result is that fseq is independently needed in every theory' (Starke 2004: 257). Although fseq is a stipulation, it is one that is needed in most theories, as far as I can see.

There is another serious problem with Starke's approach: It is not clear what exactly bans specifiers. He needs to impose a constraint that does this job, but he never gives us the constraint. Put differently, were you to insert a specifier, what exactly would go wrong? As far as I can see, nothing would go wrong, although all the undesirable consequences that Starke discusses ((91)-(96)) would of course loom large. Still, from a computational perspective, without a constraint there is nothing that would ban the merger of what we think of as a specifier. In addition

to this problem, I also mentioned some unclear issues concerning Starke's specific proposal above, and particularly the problem that arises if Moro (2000) is right. So although Starke tries to eliminate specifiers, I do not think he succeeds. But I share his goal of getting rid of specifiers, as will become evident in chapter 4. Now, let me discuss a recent proposal by Narita that has some interesting consequences for phrase structure and Spell-Out.

2.4.3.2   Narita (2011)

Narita (2009, 2011) develops a new take on Spell-Out which turns out to be relevant to the issue of whether specifiers exist. Although Narita does not try to get rid of specifiers, his proposals will turn out to be very relevant for what I'm going to suggest in chapter 4.[20]

Since my goal here is not to give a comprehensive discussion of Narita's theory, I will rather focus on the aspects that are relevant for specifiers. His system implements Moro (2000)'s and Chomsky (2008)'s claim that two phrases cannot be merged. If Spell-Out applies to the specifier, then the specifier is reduced to a head/lexical item that can be merged with the clausal spine (a phrase). And if the specifier does not undergo this kind of 'reduction', then the clausal spine has to. This way, all syntactic relations are always head-phrase, which is to say that these relations look more like head-complement relations. A picture illustrating this is provided in (98).

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[20]See also Epstein (2009) for a similar reasoning, though discussed in the context of theta marking. I will discuss Epstein's proposal in more detail towards the end of chapter 4.

(98)   XP
                                                    ⌢
                                                 X   YP

This figure shows a core syntactic relation that consists of a head and a non-head in either order.

This is something that I will argue in favor of in chapter 4, though I will argue that there should not be any optionality the way Narita has it when it comes to Spell-Out.

2.5 Conclusions

This chapter has provided an in depth discussion of several issues concerning phrase structure, and in particular focused on specifiers. I have gone through how phrase structure developed in generative grammar and in particular focused on the general aspects of the various theories. In particular, I have discussed the view of phrase structure within the Minimalist Program in great detail. A number of problems concerning specifiers have been brought forward and that discussion led me to discuss in particular Starke (2004)'s proposal of how to eliminate specifiers. This is something that I will develop in a new way in chapter 4.

Chapter 3

Motivating Full Thematic Separation

3.1   Introduction

Whereas the previous chapter provided a thorough discussion of how specifiers fit into various theories of phrase structure, the present chapter will focus much more on semantics and how logical forms for the argument domain of the clause look like.

Most linguists learn at some point that verbs have arguments. There are transitive and intransitive verbs and the difference is roughly speaking whether verbs have two arguments or just one argument. This property has been taken to be theoretically significant and has played a rather important role in generative grammar as well as in other grammatical frameworks. In essence, the idea is that the verb encodes a propositional shell in the sense that the verb is a full sentence in disguise - following a tradition going back at least to Frege. In generative grammar, theoretical principles such as the Theta Criterion posits the adicities that verbs have by requiring that the verb's arguments be present in the syntactic structure. The view is that the adicities of a verb are part of the verb's meaning and that the latter in part determines the realization of arguments.

It is important to emphasize that verbs having adicities is not a virtual conceptual necessity for formal semantics. Tarski gave a semantics for the first-order predicate calculus without any adicities. The predicates Sxy and Fa are alike in

having only sequences as satisfiers. Put different, the necessity of adicity require-ments must come from further empirical assumptions about human languages. It is those assumptions that I would like to question in this chapter.

Levin and Rappaport Hovav, in their comprehensive overview of argument realization, say that: 'We have emphasized that not only is the structural facet of meaning relevant to argument realization generalizations, but so is the root [...]' (Levin and Rappaport Hovav 2005: 238), where the root is the idiosyncratic prop-erties of a verb. The current chapter aims to show that this may not be true as far as the grammar is concerned.

The traditional view where all the verb's arguments are part of the lexical specification of the verb has been challenged in recent years. In particular, Schein (1993) and Kratzer (1996, 2000) argue that external arguments or Agents should be severed from the verb, that is, not be specified in terms of a variable that corresponds to a grammatical argument of the verb.[1] Schein and Kratzer, however, disagree on whether internal arguments or Themes should be severed as well. The goal of the present chapter is to take steps towards resolving the debate. I will argue that there are cases where verbs do not have thematic arguments. If that is the case, it raises specific questions about the syntax-semantics interface, questions that I will address in chapters 4 and 6.

In this chapter, I will present a series of arguments that supports the view that verbs do not take thematic arguments. The arguments will take the following

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[1]Similar claims have been advanced in non-generative frameworks such as Construction Gram-mar (Goldberg 1995, 2006). Here I will not discuss this literature.

form: They will show that Neo-Davidsonian logical forms, what I will refer to as full thematic separation, are the correct logical forms for certain data. These logical forms presuppose that verbs only take an event variable and that they do not take other arguments.[2]

In the postscript to their book, Levin and Rappaport Hovav state the following, which is worth quoting at length (the italics are mine):

> In chapter 1 we stressed the importance of isolating the "grammatically relevant" facets of verb meaning. Most linguists take this type of meaning to be what we characterized as the *"structural"* components of verb meaning. How does this convergence fit in with our repeated assertion that the *semantics of the root is important to many facets of argument realization*? We suggest that the basic mapping from event structure to syntax is indeed governed by a relatively small set of semantic notions: the grammatically relevant facets of meaning expressed in an *event structure*. However, the semantics of the root determines the range of event structure a particular verb is associated with, the distribution of semantic cases, and the compatibility of a verb with particular modes of information-packaging.

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[2]See Davidson (1967), Parsons (1990), Lasersohn (1995), Bayer (1996), Rothstein (1998), Landman (2000), and Tenny and Pustejovsky (2000) for a summary of the traditional arguments in favor of event variables.

It is perhaps fitting to conclude this book with the *observation* that the lexical semantics of the root determines in many complex ways different facets of argument realization. This observation is worthy of note in light a recent trend towards shifting the burden of explanation to extralexical factors. Although such factors are clearly present, the recognition that lexical semantic factors are still very relevant affirms research programs that pay close attention to the lexical semantics of verbs, despite the notoriously elusive nature of word meaning.

(Levin and Rappaport Hovav 2005: 241)

Many researchers have argued that properties of the verb influence or even determine how the verb's arguments are realized. However, in the present chapter I present arguments against this view.[3] There have been a number of such arguments in the literature, as Levin and Rappaport Hovav mention; see Krifka (1989, 1992), Parsons (1990: 96-99), Schein (1993), Gomeshi and Massam (1994), Ritter and Rosen (1996), Herburger (2000), Baker (2003), Borer (2005a,b), Marantz (2005), Åfarli (2007), Williams (2005, 2008), Pietroski (2007), Boeckx (2010), Cuervo (2010) and Platzack (2011) for the verbal domain and Barker (1998) for the nominal do-

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[3]An initial reason for thinking that this is the case is provided by the three verbs *eat*, *dine* and *devour*. These verbs all have roughly the same meaning, but quite different subcategorization requirements: *eat* is optionally transitive, *dine* is intransitive and *devour* is obligatorily transitive. Thanks to Lucas Champollion (p.c.) for reminding me of this.

main. Here I focus on a few of these arguments, namely the ones presented by Schein, Herburger and Borer. These arguments have never been gathered together in one place before so I think it will be useful to do that. Special attention will be devoted to the issue of whether Themes should be severed from the verb's argument structure or not.[4]

It is worth emphasizing that the present approach does not suggest to dispense with the event argument.[5] I will return to some more discussion of this below.

The chapter is organized as follows. I start out by discussing Schein (1993)'s development of the proposal in Parsons (1990), where I will in particular focus on Schein's argument for severing the Agent. I will also present a couple of other arguments, based on Herburger (2000), Schein (2003), Borer (2005a) and Williams (2008) in favor of also severing the Theme. Then I will discuss Kratzer (1996) and her argument that the Theme should not be severed from the verb. Here I will in particular focus on Kratzer's explicit formal semantics for her logical forms and I will also show how that semantics could easily be applied if the Theme also should be severed. The entire chapter, together with the previous one, set the stage for chapter 4, where I present a way of cashing out full thematic separation through eliminating the categorical distinction between specifiers and complements.

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[4]Bayer (1996) presents a very long discussion of whether Neo-Davidsonian representations are better than Davidsonian logical forms. He concludes that they are not. Most of the issues I discuss below are not discussed by Bayer or discussed inadequately (like his discussion of Schein (1993)), so I will not engage in a detailed rebuttal of Bayer's claims in this chapter.

[5]It may even be possible to argue that having an event argument is what makes a lexical item a verb, though I won't pursue this possibility here.

3.2 Motivating Full Thematic Separation

Davidson (1967) suggests that an event variable is crucial to the representation of verbal meaning. Concretely, he suggests the representation in (1) for (2).

(1) Jones buttered the toast.

(2) ∃e[buttering(e, Jones, the toast)]

Davidson argues that these event representations are well-suited to capture important entailment relations. Consider the examples in (3)-(7).

(3) Jones buttered the toast.

(4) Jones buttered the toast slowly.

(5) Jones buttered the toast slowly in the bathroom.

(6) Jones buttered the toast slowly in the bathroom with a knife.

(7) Jones buttered the toast slowly in the bathroom with a knife at midnight.

In these examples, (7) entails (3), (4), (5), and (6); (6) entails (3), (4), and (5); (5) entails (3) and (4); (4) entails (3). This follows straightforwardly if there is an event modifier common to all the modifiers. The modifiers can then be linked by conjunction, in which case the entailments would follow as a natural consequence of conjunction reduction.

(8) ∃e[buttering(e, Jones, the toast) & Slow(e) & In(e, the bathroom) & With(e, a knife) & At(e, midnight)]

Immediately after Davidson presented the proposal in (2), Castañeda (1967) argued that the thematic arguments could be severed from the verb. That is, (2) could

rather be represented as in (9), where thematic relations are independent two-place predicates.

(9)   ∃e[buttering(e) & Agent(e, Jones) & Theme(e, the toast)]

Logical forms with this structure are called Neo-Davidsonian. Dowty (1989) calls (2) the 'ordered-argument' method and (9) the 'neo-Davidsonian' method.[6]

Note that the original Davidsonian proposal lumped the event argument and the thematic arguments together at logical form. As I will argue, it is a virtue of the Neo-Davidsonian proposal that this distinction is restored. On a Neo-Davidsonian approach, verbs are monadic in the sense that they only have a single argument, namely the event argument. As mentioned above, this offers a way to classify verbs in the sense that one can say that the event argument is what makes a lexical item a verb. This requires that one insists that verbs and their corresponding gerunds are not synonyms (pace e.g., Parsons (1990)).[7] I will not take on that task in this paper, as the goal is not to discuss the question of what makes a verb a verb.

It is important to note that Parsons would be happy if all decomposition is assigned to the lexicon. That is, we could stipulate the meaning postulate in (10) and this would suffice.

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[6]Since Gruber (1965) and Jackendoff (1972), there has been a lot of discussion of what the appropriate thematic roles are. See Dowty (1991) for arguments that we can only define prototypical roles, though Schein (2002) argues against this.

[7]Verbs and gerunds will have different meanings. One way to put it is that the verb *run* is a predicate of events but *running* is a referring expression that designates plurally just those events that satisfy *run*.

(10)   'V(e, F, G)' is true $\leftrightarrow \forall x(\text{Agent}(e, x) \leftrightarrow Fx) \land V^*e \land \forall x(\text{Theme}(e, x) \leftrightarrow$

   $Gx)$ (Schein 1993: 9)

Thus, it is crucial to distinguish decomposition from separation, where the latter assumes that all thematic arguments are never part of the verb, either in logical forms or in the lexicon. Parsons mostly assumed decomposition rather than separation, which is why I do not include Parsons among Neo-Davidsonians.

Parsons (1990: 96-99) presents an argument for why decomposition is required (see also already Bartsch (1976), Carlson (1984), Higginbotham (1985, 1986), Taylor (1985), Krifka (1989, 1992)). It concerns examples such as (12) and the polyadic analysis in (14).

(11)   Brutus stabbed Caesar.

(12)   Caesar was stabbed.

(13) $\exists e[\text{stabbing}(e, b, c)]$

(14) $\exists e \exists x[\text{stabbing}(e, x, c)]$

Parsons instead defends the analysis in (16).

(15) $\exists e[\text{stabbing}(e) \land \text{Agent}(e, b) \land \text{Theme}(e, c)]$

(16) $\exists e[\text{stabbing}(e) \land \text{Theme}(e, c)]$

The problem with the non-decomposed logical form is that it is not possible for the logical form to predicate a stabbing event in such a way that it does not entail the existence of a corresponding agent. One can construct sentences where no such agent exists. Parsons gives the example of reporting a dream in (17).

(17) In a dream last night, I was stabbed, although in fact nobody had stabbed
      me, and I wasn't stabbed with anything.

Parsons (1990: 98) presents this as 'a report of an incoherent dream, one in which,
say, I am bewildered by the fact that I have been stabbed but not by anyone or
anything'. It is difficult to achieve this without decomposition as (14) incorrectly
asserts the existence of an agent and (18) yields a contradiction.

(18) $\exists e[\exists x[stabbing(e, x, i) \wedge \neg\exists x[stabbing(e, x , i)]]$

However, decomposition gives us the desired logical form, as shown in (19).

(19) $\exists e[stabbing(e) \wedge Theme(e, i) \wedge \neg\exists x[Stabber(e, x)]]$

See Schein (1993: 94) for further support of this argument, though from the point
of view of separation, and Bayer (1996: 206) for counterarguments.

It is important to point out that what both Davidson and Parsons call 'logical
form' is not the same as the notion as Logical Form (LF), which is a syntactic
level of representation (cf. May (1977, 1985)). As Hornstein (2002: 345) points
out, the 'conception of LF is analogous (*not* identical) to earlier conceptions of
logical form (or logical syntax) [. . .] found in the work of philosophers like Frege,
Russell, Carnap, and Strawson'. Kratzer (1996: 110) cites Parsons (1993) saying
that the theory in Parsons (1990) is a 'proposal for the logical forms of sentences,
unsupplemented by an account of how those forms originate by combining sentence
parts'. On such a theory, one can for example argue that there is ordered argument
association in the syntax and in conceptual structure, or one can argue that there is
ordered argument association in the syntax but separation in conceptual structure.

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Yet another option is to argue that there is separation both in the syntax and conceptual structure. The latter is Schein's project (Schein 1993: 11), as I will illustrate in detail below. One can also take intermediate positions, as Kratzer (1996) does, where only the Agent is severed in the syntax (Kratzer is explicitly agnostic about conceptual structure). This issue will play an important role in the present chapter, and I will return to a more comprehensive discussion below.

In the next subsection, I will discuss arguments for full thematic separation.[8] I will focus mostly on semantic arguments and not so much on syntactic arguments (see Borer (2005a,b), Marantz (2005), Boeckx (2010) and Bowers (2010) on the latter). Then I will go on to discuss Kratzer's approach in the following section.

3.2.1 Schein (1993) on Severing the Agent from the Verb

Schein (1993) puts forward arguments that show that we need the representation in (9), a representation that he refers to as full thematic separation. Schein makes the strong claim that the Agent relation, the Theme relation and the verb relation are independent of each other.

Schein's project is to argue that lexical decomposition, as seen above, is not

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[8]I will not discuss the proposal in Krifka (1989, 1992) for reasons of space as it is quite complex. Essentially, Krifka suggests a theory of how the reference of nominals that bear thematic roles affects the aspectual understanding of the events they participate in. Various patient relations are analyzed in terms of how they map the mereological structure of the object to the mereological structure of the event. To do this, Krifka needs to separate the thematic relations from the verb. See Larson (Forthcoming) for more discussion.

sufficient. Schein (1993: 10) says that 'The argument for a radical decomposition is an argument that decomposition enters into the logical syntax'. The project is then to argue that (10) is not sufficient. The way Schein makes this argument is to put a Theme in between the Agent and the verb. as illustrated in (20). If the Agent is not lexically represented on the verb, but rather introduced by structure separate from the verb, the Agent can be the agent of an event that is not that of the verb.

(20)

Agent   Theme   V

Schein introduces such a case involving a distributive quantifier as the Theme. Such a Theme may induce a mereological partition relation between the event of Agent and the event of the verb. Importantly, though, in this case no substantive verbal meaning is added. There is not a substantial semantic relation to the event of the verb, as e.g,, a causative would contribute, but simply the mereological relation. In order to make this clearer, let us see how a mereology of events is motivated.

Consider the data in (21), from Schein (1993: 7).[9]

(21)   a.   Unharmoniously, every organ student sustained a note on the Wurlitzer
             for sixteen measures.

        b.   In slow progression, every organ student struck a note on the Wurlitzer.

Schein argues that the reading for (21a) where each student is related to a note on the Wurlitzer, that is, for each to have an event of his own, the quantifier must include a quantifier of events within its scope. Note that it is not the individual note

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[9]See Ferreira (2005) for more discussion of this issue.

that is unharmonious but the ensemble. Each of the students only play a part in the larger action. There is no other way to get this reading, and the sentence would be false if, for example, one of the students keeps it going for eight measures and then another student does the other eight, as Schein observes. The same argument can be made for (21b). The solitary events performed by the students can only be related to the larger one as parts of the whole. Summarizing, the merological relation is encoded through a quantifier which includes the condition that e' is part of e ($e' \leq e$).

Now that we have seen why mereological relations are required, let us turn to the central data points. Schein's discussion centers around cases like (22)-(25). I will in what follows concentrate on (22).

(22) Three video games taught every quarterback two new plays.
Intended reading: 'Between the three of them, the video games are responsible for the fact that each quarterback learned two new plays.'

(23) Three agents sold (the) two buildings (each) to exactly two investors.

(24) Three letters of recommendation from influential features earned the two new graduates (each) two offers.

(25) Three automatic tellers gave (the) two new members (each) exactly two passwords.

One may wonder why Schein adds the third NP *two new plays* in (22). The reason is that this eliminates the possibility that the crucial universal *every quarterback* denotes a group, e.g., *the quarterbacks*. If we were dealing with a group denotation,

one could possibly analyze (22) as akin to *The games taught the quarterbacks*. That is, the group of games taught the group of quarterbacks. If that is the case, the particular reading that Schein has identified does not obtain. Therefore, in the example at hand, the universal has to denote a genuine quantifier since it has an indefinite that depends on it. That is, *two new plays* depends on *every quarterback*: for every quarterback there are two new plays that he learned. The claim is that the mereological/part-whole relation among events ($e' \leq e$) connects quantification over quarterbacks and their solitary events to the larger event where three video games are the teachers (Schein 1993: 8). So *every quarterback* and *three video games* are cumulatively related, but *every quarterback* also seems to behave like an ordinary distributive quantifier phrase in its relation to *two new plays*, as Kratzer (2000) makes clear. This is the fact that Schein tries to describe and explain.

Note that in the logical form above, the Agent and the Theme are independent of each other and also of the verb (Schein 1993: 57). (Schein 1993: 8, 57) suggests a corresponding logical form for (22), namely (26) (Schein 1993: 8, 57), where *INFL* means the Agent event.[10]

(26) $\exists e(\text{teach}(e)$

$\wedge \exists e([\exists X\colon 3(X) \wedge \forall x(Xx \to Gx)]\forall x(\text{INFL}(e, x) \leftrightarrow Xx)$

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[10]A brief note about Schein's take on plurals, which is important for understanding his logical forms: A plural like *the As* is a second-order description of a predicate: a predicate such that if it holds of x, x is an A. This means that *the cats* comes out as a definite second-order description:

(i) $\iota Y(\exists y Yy \wedge \forall y(Yy \leftrightarrow cat(y))$

$$\wedge \; [\text{every } y\text{: } Qy] \; [\exists e'\text{: } e' \leq e](\forall z(\text{TO}(e',\, z) \leftrightarrow z = y)$$

$$\wedge \; [\exists Z\text{: } 2\; (Z) \wedge \forall z(Wz \rightarrow Pz)]\forall z(\text{OF}(e',\, z) \leftrightarrow Wz)))^{11}$$

We can spell this out in plain(er) English as in (27).Note that the lower case e and the use of singularity are just for simplicity. In real life these are second-order quantifiers.[12]

(27)   There is an event e, and e is a teaching,

and a three-membered plurality X comprising only video games, such that

for every x, x is an agent of e just if it is among those three in X,

and for every quarterback y, there is a part e' of e, such that the targets of

the teaching are all and only the quarterbacks,

and there is a two-membered plurality Z, comprising only plays, such that

the content of the teaching e' was all and only the plays of Z.

We see that the part-whole relation among events $(e' \leq e)$ connects quantification over quarterbacks and their solitary events to the larger event where three video games are the teachers (Schein 1993: 8). Notice that in the logical form above, the

[11]Brasoveanu (2010) and Champollion (2010a) argue that event variables are not required in this logical form, a view that comes with difficulties when faced with generalized quantifiers such as *most*. Furthermore, although both Brasoveanu and Champollion code the mereology differently, it is not clear to me that this is an argument against having events in the logical forms, given the existence of many independent arguments for event variables (see e.g., footnote 2 of this chapter). So even if one were to grant that Schein's argument did not go through, there are still other arguments for events that to my knowledge have not been explained away.

[12]Schein (1993) observes that this formulation is actually not strong enough. See his book for more discussion.

Agent and the Theme are scopally independent of each other and also of the verb. Here is what Schein says about the interpretation of (26).

(28) It is]...] essential to the meaning of [(22)] that the θ-role bound into by the subject not occur within the scope of other quantifiers, as in [(26)], and that the action of the three video games be related mereologically to what happened to the individual quarterbacks (Schein 1993: 57).

Schein devotes a lot of time to showing that if *teach* is a polyadic predicate, we do not get the correct logical forms. That is, in (29), either the universal will be inside the scope of the plural, or the reverse, and all thematic relations will be within the scope of any quantifiers.[13]

(29) $[\exists X: 3(X) \wedge \forall x(Xx \to Gx)]$ [every y: Qy] $[\exists Z: 2(Z) \wedge \forall z(Zz \to Pz)]$

$\exists e$ teach(X, y, Z, e) (Schein 1993: 57)

As Schein points out, the problem for such polyadic logical forms is to find a meaning that relate individual objects to plural objects. From the point of view of entries such as (29), the difference between (22) and (30) is only a matter of scope. The logical form is given in (31).

(30) Every quarterback was taught two new plays by three video games.

(31) [every y: Qy] $[\exists Z: 2(Z) \wedge \forall z(Zz \to Pz)]$ $[\exists X: 3(X) \wedge \forall x(Xx \to Gx)]$

$\exists e$ teach(X, y, Z, e) (Schein 1993: 58)

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[13]Though see McKay (2006) for a different view. However, McKay's theory does not generalize to adding adverbials. He is also not attempting to provide a theory of how humans understand natural language locutions.

But the meaning of (22) is crucially different in ways that scope does not reflect. In (30), all the NPs related to plural objects occur in the scope of the quantifier over individual objects. This is different in (22) since one of these NPs has escaped, as Schein puts it. I will not go through all the other illustrations Schein provides of why polyadic predicates fail to give the correct meanings and instead I refer the reader to chapter 4 of his book for comprehensive discussion.

Kratzer (2000) furthermore shows that it is technically possible to get around Schein (1993)'s argument for severing the Agent. Here I will outline her argument and emphasize, as she does, what one has to buy in order to escape Schein's arguments. Kratzer uses the sentence in (32) and the goal is to derive the logical representation in (33). This logical form is simplified compared to the logical form Schein has, but the simplification does not matter for present purposes.

(32)   **Three copy editors caught every mistake (in the manuscript)**

(33) $\exists e \exists x [3 \text{ copy editors}(x) \wedge \text{agent}(x)(e) \wedge \forall y[\text{mistake}(y) \rightarrow \exists e'[e' \leq e \wedge \text{catch}(y)(e')]]]$

Kratzer makes the following assumptions:

(34)   a. Denotations are assigned to bracketed strings of lexical items in a type-driven fashion (Klein and Sag 1985)

      b. For any string α, $T(\alpha)$ is the denotation of α

      c. Types: e (individuals), s (events or states; eventualities as in Bach (1981)), and t (truth-values)

      d. Composition Principles: Functional Application and Existential Closure (for this example)

With these assumptions in hand, she provides the following derivation:

(35)   a. T(**every mistake**) = $\lambda R_{<e<st>>}\lambda e\forall y$ [mistake(y) → ∃e'[e' ≤ e ∧ R(y)(e')]]

b. T(**catch**) = $\lambda Q_{<<e<st>><st>>}\lambda x\lambda e$ [agent(x)(e) ∧ Q(catch$_{<e<st>>}$(e))

c. T(**catch (every mistake)**) =

$\lambda x\lambda e$ [agent(x)(e) ∧ T(**every mistake**) (catch)(e)] =

$\lambda x\lambda e$ [agent(x)(e) ∧ ∀y [mistake(y) → ∃e'[e' ≤ e ∧ catch(y)(e')]]]

From (a), (b), by Functional Application.

d. T(**3 copy editors**) = $\lambda R_{<e<st>>}\lambda e\exists x$[3 copy editors(x) ∧ R(x)(e)]

e. T(**3 copy editors (catch (every mistake))**) =

T(**3 copy editors**)($\lambda x\lambda e$ [agent(x)(e) ∧ ∀y [mistake(y) → ∃e'[e' ≤ e ∧

catch(y)(e')]]]) =

$\lambda e\exists x$[3 copy editors(x) ∧ agent(x)(e) ∧ ∀y [mistake(y) → ∃e'[e' ≤ e ∧

catch(y)(e')]]]

From (c), (d), by Functional Application.

f. ∃e∃x[3 copy editors(x) ∧ agent(x)(e) ∧ ∀y[mistake(y) → ∃e'[e' ≤ e ∧

catch(y)(e')]]]

From (e), by Existential Closure.

This derivation gets us the intended reading, without severing the Agent. Step (b) shows that all the arguments of **catch** are part of the lexical entry. Note, however, the price we have to pay to be able to do this is clear: 1) A complicated semantic type for the direct object position of **catch** is needed, and 2) it's necessary to posit different argument structure for **catch** and 'catch', that is, the object language word

and the meta language word would have different denotations. Many semanticists, including Kratzer, argue that this is not a price we should be willing to pay, and she goes on to show that severing the Agent makes it possible to do without these two assumptions. Furthermore, a derivation of the sort that we have just seen does not preserve the intuition (e.g., in Levin and Rappaport Hovav (1995)) that there is an 'underlying' matching of semantic structure to argument structure.

Notice that so far we have only seen a claim that Agents have to be fully severed from the verb. This is similar to the claims in Kratzer (1996) and Marantz (1997). In fact, Schein (1993) leaves open the possibility that 'V(e) & Theme(e, x)' could be abbreviated 'V(e, x)'. Although the latter collapses verb and thematic role, the Theme argument x is still separated from any other nominal argument. In later work, (Schein 2003) argues against this based on cases like (36).

(36)   The cockroaches suffocated each other.

The sentence in (36) could be true 'even where only the entire group sits at the cusp of catastrophe' (Schein 2003: 349). Put differently, had there been only one less cockroach, all cockroaches would have survived. Schein (2003: 350) observes that none of the following paraphrases are accurate to capture this reading.

(37)   The cockroaches each suffocated the others.

(38)   The cockroaches each suffocated some of the others.

(39)   The cockroaches suffocated, each suffocating the others.

(40)   The cockroaches suffocated, each suffocating some of the others.

The problem is that all the paraphrases assign *each* a scope that includes the verb.

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The main point here is that each cockroach is in a thematic relation to some event E that contributed to the mass suffocation. But E is not itself a suffocation of one cockroach by another. Schein concludes that the scope of *each* includes the thematic relation, but not the event predicate *suffocate*. He gives the logical form in (41), which has the paraphrase in (42) (Schein 2003: 350). The logical form itself is not that important since Schein has other fish to fry as well in this paper; the paraphrase should be the focus of attention.

(41) $\exists e[\text{the } X : \text{cockroaches}[X]](\text{Agent}[e, X] \& \text{suffocate}[e] \& \text{Theme}[e, X] \&$

$[\iota X : \text{Agent}[e, X]][\text{Each } x : Xx] [\iota e' : \text{Overlaps}[e', e] \& \text{Agent}[e', x]]$

$[\exists e'' : t(e'') \leq t(e')] [\iota Y : \text{Others}[x, Y] \& \text{Agent}[e'', Y]] \text{Theme}[e', Y])$

(42) 'The cockroaches suffocate themselves,

(with) them each acting

against the others that acted.'

Had there been only one less cockroach, they would all have made it. So each does something to some of the others that contributed to their mass suffocation, but it is not a suffocation, as all the paraphrases in (37)-(40) would suggest.

Some readers may object that there are many independent issues that need to be dealt with concerning reciprocity before the above argument can be accepted. Here I will not discuss reciprocity in detail, but refer the reader to Dotlačil (2010) and LaTerza (2011) for further arguments that reciprocity requires full thematic separation.

In what follows, I will go on to discuss other arguments in favor of full thematic

separation, before I return to the issue of the Theme.

3.2.2 Herburger (2000) on focus and thematic separation

Herburger (2000), developing ideas of Partee (1992, 1999) presents an argument in favor of full thematic separation which she claims is necessary in order to give an adequate account of focus (see also Kawamura (2007)). Her arguments presuppose that we want the semantics to be of a Davidsonian character. That is, the argument below is not an argument that this is the only adequate analysis of focus.

Consider the focus-neutral sentence in (43) and its logical form in (44).

(43)   Milan bought cider.

(44) $\exists e[\text{buying}(e) \ \& \ \text{Agent}(e, \text{Milan}) \ \& \ \text{Theme}(e, \text{cider})]$

If we then put focus on *cider*, we get the following logical form, Herburger argues.

(45)   Milan bought CIDER.

(46) $\exists e[\text{buying}(e) \ \& \ \text{Agent}(e, \text{Milan})] \ \text{Theme}(e, \text{cider})$

In (46), the non-focused part is the restrictor of the existential quantifier whereas the focus element falls within the scope of the quantificational structure. That is, the restrictor is what is presupposed and the scope is what is asserted. If we instead focus either *Milan* or *bought*, we get the logical forms in (48) and (50).

(47)   MILAN bought cider.

(48) $\exists e[\text{buying}(e) \ \& \ \text{Theme}(e, \text{cider})] \ \text{Agent}(e, \text{Milan})$

(49)   Milan BOUGHT cider.

(50) ∃e[Agent(e, Milan) & Theme(e, cider)] buying(e)

These logical forms show that in order to give a Neo-Davidsonian analysis of focus, full thematic separation is required. Note that the thematic relation itself has to be outside the presupposed part - it is not sufficient to just place the content of the focused element outside the presupposed part. That is, a logical form like (51) is not sufficent.

(51) ∃e[buying(e) & Agent(e, Milan) &Theme(e, x)] x = cider

Were (51) to suffice, a Davidsonian version should suffice as well:

(52) ∃e[buying(e, Milan x)] x = cider

However, since verbs can be focused as well, as shown in (50), we need the thematic arguments to be severed from the verb. Otherwise a more complicated story needs to be told for cases involving verb focus, and we do not get a symmetric account where both verbal focus and thematic focus are captured in the same way.

The next argument concerns the variable adicity that many verbs display.

3.2.3 Variable adicities

There is a different argument in favor of full thematic separation that comes from Borer (2005a). Borer's concern is varying degrees of adicity that predicates appear to exhibit. Let us first start with a case from Clark and Clark (1979), which involves the verb *to siren*.

(53) The factory horns sirened throughout the raid.

(54) The factory horns sirened midday and everyone broke for lunch.

(55) The police car sirened the Porsche to a stop.

(56) The police car sirened up to the accident site.

(57) The police car sirened the daylight out of me.

Even if native speakers of English have never heard *siren* used as a verb, they can easily interpret these sentences. The examples show that the new verb can appear with several subcategorization frames where the core meaning seems to be maintained (to produce a siren sound), though the specific meanings are augmented according to the syntactic environment. This strongly suggests that the meaning of *siren* cannot just come from the verb itself, but it depends on the syntactic construction. Such a view fits nicely with a Neo-Davidsonian theory where the verb only has an event argument.

There are many similar examples. Consider the following ones, taken from Pietroski (2007). I include PPs in some cases to display more of the variability that many verbs display.

(58) White sold the knife to Plum for ten dollars.

(59) Plum bought the knife from White for ten dollars.

(60) Plum bought the knife for ten dollars.

(61) Plum bought the knife.

(62) Plum bought the knife for Scarlet.

(63) Plum bought Scarlet the knife for ten dollars.

(64)   White sold Plum on the idea of buying a knife.

(65)   Scarlet's broker recommended buying long and selling short.

These examples show that verbs like *buy* and *sell* can appear in different contexts and with varying adicities. This is not an idiosyncracy related to these verbs. The verb *kick* seems paradigmatically transitive (66), but there are also examples that undermine that conclusion, as in (67)-(69).

(66)   White kicked the knife.

(67)   White kicked the knife to Plum.

(68)   White kicked Plum the knife.

(69)   The baby kicked (at nothing in particular).

Similarly, *cook* and *sing* are typically not assumed to be ditransitive. However, Pietroski points to the following examples in (70)-(72).

(70)   Mrs. White cooked an egg, while Colonel Mustard sang.

(71)   White cooked an egg for Mustard, while he sang a lullaby.

(72)   White cooked Mustard an egg, while he sang the baby a lullaby.

It is of course a theoretical possibility that *sang, cook* and *kick* are ternary predicates and that there are covert arguments in cases like (66) and (70). A further case of this concerns the verb *jimmy* (Williams 2005). This appears to be a transitive verb.

(73)   Alexander jimmied the lock with a screwdriver.

(74)   Alexander jimmied the lock.

Here, the reference to an implement cannot appear as a third argument, it has to be in a modifying phrase. Still, the verb *jimmy* presumably indicates a triadic concept that in some way or other has a slot for an implement 'with which the jimmier jimmies the thing jimmied' Pietroski (2007: 358). As Pietroski puts it, apparent transitivity does not seem to tell us much about conceptual adicity.

In some cases, it is quite plausible to assume covert arguments, as in (75)-(76).

(75)   John ate.

(76)   Mary played.

Other verbs do not appear to allow direct objects, like *dine*. Still, there are examples such as (77)-(78) that suggest that the concepts EAT and DINE are equally relational (Chomsky 1986b).

(77)   Mustard dined on shrimp.

(78)   Mustard ate shrimp in high style.

A last example involves the concept of marriage. The following examples show that there is no fixed adicity for this lexical entity either.

(79)   Scarlet married Plum, but their marriage was doomed.

(80)   Scarlet got married to Plum, with the Reverend Green officiating.

(81)   With reservations, Green married Plum and Scarlet.

(82)   It was Scarlet's first marriage, though Plum married for the third time.

Common to this example and the others I have discussed is that on standard assumptions, one can accommodate such facts by stipulating a number of ambiguities

in addition to covert arguments. But ambiguities do not explain anything, and is only something one should resort to if there are no other options.

Relevantly, these facts follow if thematic arguments are not arguments of the verb. That is, full thematic separation means that verbs do not have adicities. Of course, as Pietroski points out, it may be that many verbs have 'canonical' numbers of arguments, something that probably reflects the adicities of the given *concepts.* However, this is very different from saying that verbs have arguments. On this view, the idiosyncracies that we observe are due to complex interactions between grammatical principles and conceptual knowledge, in addition to language use; cf. Borer (2005a,b). Below I will consider a case study of this, where I compare the conceptual account to a grammatical account. But first, let us look more closely at themes.

The main target for rebuttal is that the obligatoriness of a theme indicates 'V(e,x)' rather than 'V(e) & Theme(e,x)' and that the obligatory presence of an argument indicates that there is an argument position and that the host verb encodes this argument position. Now, consider the following data.[14]

(83)   *Barry stepped.

(84)   *Barry stepped the path into the garden.

(85)   Barry stepped into the garden.

A Neo-Davidsonian cannot hold the view that I just described. The verb *step* has an obligatory PP, though if that is indicative of the adicity of this verb, *into the*

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[14]Thanks to Barry Schein (p.c.) for useful discussion about these cases.

garden does not have a consistent Davidsonian semantics despite being a poster child for such a semantics. If we want to maintain the Davidsonian semantics for *into the garden*, the above examples do not indicate that the Theme predicate is obligatory. Something else needs to account for this apparent obligatoriness of the PP associated with the verb *step*.

There are also cases of disjunctive obligatoriness.

(86) *Mary passed.

(87) *Mary crossed.

(88) Mary passed the garden.

(89) Mary crossed the garden.

(90) Mary passed into the garden.

(91) Mary crossed into the garden.

The same argument that I just made applies to these sentences as well. We cannot conclude anything about obligatoriness based on such data.

However, there are other data that have been taken to suggest that we need a syntactic encoding of argument structure. Those are cases such as the following, which have been discussed at length in the literature.

(92) *Plum arrived Scarlet.

(93) *Plum sent.

We have seen a number of arguments that lexical items do not have fixed adicities, so if we are convinced by those arguments, we cannot say that these examples are

out because these adicities are not fulfilled in the grammar (pace Ramchand (2008: 21-22)). The examples also do not suggest that predicates can acquire adicities. The question is then how we analyze examples such as (92)-(93).

There are prominent syntactic replies, sometimes combined with semantic factors as well; cf. e.g., Perlmutter (1978), Levin and Rappaport Hovav (1995), Hale and Keyser (2002). The syntactic reply holds that the overt subject is actually covertly merged in the object position and then moves to its surface position. However, that is one way to analyze data such as (92), though it does not extend to (93). It may be that there is a unified syntactic explanation for these cases, as I will discuss shortly, or it may be that the syntax does not encode these limitations in a unified way. At any rate it seems to be an open question how to exactly rule out examples such as (92)-(93), which clearly are data that we need to account for.

One way to deal with these examples is to follow Borer (2005a), who argues that examples like (92)-(93) are not excluded for grammatical reasons.[15] That is, it is not possible to combine the concepts PLUM, ARRIVED and SCARLET or PLUM

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[15]Borer (2005a) seems to argue that there are not really any unacceptable examples of the sort in (92)-(93) because speakers can coerce plausible interpretations out of most structures. Still, she concedes that some examples are more acceptable than others. In the case of *Plum arrived Sarlet* there seems to be an interpretation where 'Plum helped Scarlet arrive', but it's nevertheless the case that one cannot use (92) to utter that thought. So it seems like we need to account for the perceived unacceptability of these data. These cases are however different from, say, extraction out of relative clauses (i), where one just cannot construe a relevant interpretation.

(i)   What did John read an article that is about?

and SENT. The reasons for this are not explicated in Borer (2005a,b), presumably because they require a better understanding of concepts than we have at present. Borer is mostly concerned with arguing that these are not facts that the grammar should account for. Rather, they are facts about language use and about concepts that do not belong to the grammar proper. Unfortunately we do not know a whole lot about how concepts are structured and organized. They could be Fregean in nature, as Fodor (1975, 1987, 2008) argues is the case for the Language of Thought. It could also be that lexical conceptual structures in the sense of Levin and Rappaport Hovav (1995) are part of the Conceptual-Intentional interface. If that is the case, the accounts they offer of data such as (92)-(93) can be carried over in a framework where the status of examples like (92)-(93) are not taken to be grammatical facts.

I am not going to choose one particular way of doing it here, as it is not exactly clear to me what the relevant evidence would look like. Future research will hopefully tell us more about how exactly to analyze the facts on such a view.[16]

[16]There might be some examples that do not fit the account I have just offered (thanks to Chris Barker (p.c.) for alerting me to this). Consider the following contrast.

   (i)   The doctor amputated John's leg.

   (ii)   *The doctor amputated the leg from John.

For (ii), it does not seem plausible to argue that this is bad because we cannot construe a relevant interpretation. The interpretation is readily accessible, and can be paraphrased as in (i). The sentence does also not seem to be bad for syntactic reasons since Romance inalienable constructions exhibit a syntax comparable to that of (ii).Vergnaud and Zubizarreta (1992) give an analysis of the differences between English and French inalienable constructions that could be implemented here, but since their story is fairly complex and rests on a number of theoretical assumptions within GB

Another way to deal with the examples in (92)-(93) is to maintain that there is a grammatical reason why they are bad. Even though I claim that this cannot be because the relevant verbs take a limited number of thematic arguments, there are other grammatical reasons why they are bad. This path might be better because of data such as (94)-(95) (see, among many, Levin (1993), Levin and Rappaport Hovav (2005)).

(94) I loaded the truck with hay.

(95) I loaded hay onto the truck.

(96) I loaded the truck.

(97) I loaded the hay.

(98) *I loaded onto the truck.

(99) *I loaded with hay.

The last two cases are presumably taken to be attempts at expressing the thoughts 'there was loading onto the truck' and 'there was loading with hay'. Verbs like *load* have been argued to have a grammatical requirement that there be a direct internal argument, i.e., a Theme.[17] I am going to suggest that one plausible grammatical component is abstract Case. Following the by now standard assumption that

Theory, I will not repeat their account here for reasons of space.

[17]Though even this is not clear, when one considers cases like the following:

(i) Peter loaded, while Jim gathered.

There may be a covert argument in these cases, though even if there is, why can it go unexpressed in (i) and not in (98)-(99)?

functional heads assign Case (see, among others, Déprez (1989), Mahajan (1989), Chomsky (1991), Johnson (1991)), one can argue that the absence or presence of the relevant Case feature on a functional head determines whether a sentence is licit or not.[18] That is, for a case like (92), the verb *arrive* does not occur together with the functional head that assigns accusative Case.[19] This means that when we have a case like (92), the second argument *Scarlet* will not receive Case. Similarly, *load* needs to occur with a functional head that assigns accusative Case and that Case needs to be discharged when present (cf. the Inverse Case Filter of Bošković (1997)).

As for (98) and (99), these can be captured in the same way, where the necessity of a Theme is related to a functional head that assigns accusative Case. However, there is a lot of work on the locative alternation in English (see Arad (2006) for a review), and Borer (2005a) provides a different story that incorporates the semantic facts (not discussed here) as well. Both the Case story and the story given by Borer would work within the present framework. It is worth noting that the Case story does not seem very different from positing lexical stipulations that require certain conjuncts for certain verbs. So I am skeptical that this story can be the correct one.

For verbs that have variable adicities, the verb will have to be able to occur with different functional heads. Assuming that indirect objects are licensed by an

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[18]This is reminiscent of Pesetsky (1982)'s reply to Grimshaw (1979).

[19]An unanswered question on this story is how we ensure that the functional heads occur together with the relevant lexical items or roots. This is a general problem. Suppose Case were assigned by verbs. Then the question is what determines what and how many Cases the verb has to assign. Though bear in mind that the need for stipulations on a no argument structure view is not evidence of argument structure.

Applicative head (Marantz 1993, McGinnis 2001, Pylkkänen 2008), this head can optionally be present for verbs like *buy*. To give a concrete example, for the sentence in (100), we get the traditional tree in (101).

(100)   John bought Mary a book.

(101)

TP
- John
- T'
  - T
  - *v*P
    - ~~John~~
    - *v'*
      - bought
      - ApplP
        - Mary
        - Appl'
          - ~~bought~~
          - VP
            - ~~bought~~   a book
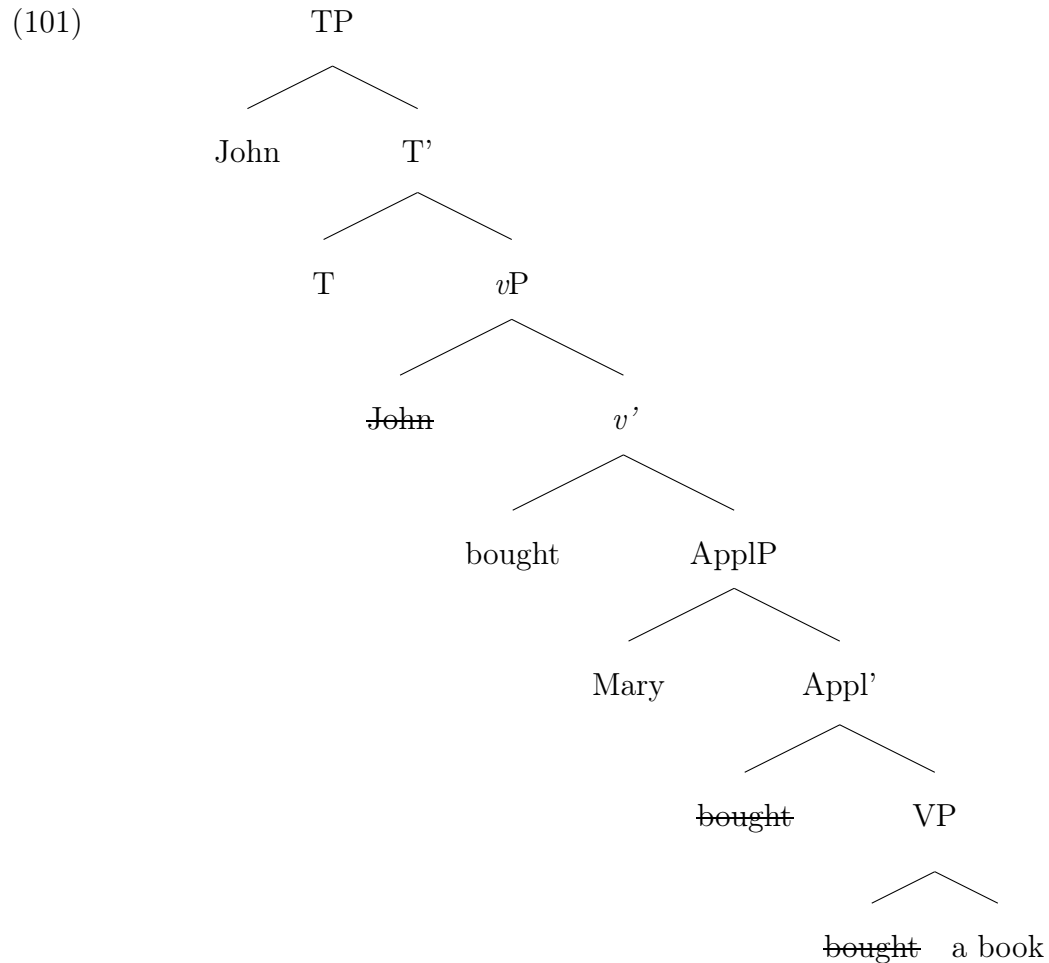
In this tree, T assigns Case to the subject *John*, Appl assigns Case to the indirect object *Mary* and *v* assigns Case to the object *the book*. If the Appl head is not merged, we get a transitive sentence like *John bought a book*. Based on these simple illustrations, it seems like a Case-based story is a way to maintain that the data I have discussed here have a grammatical side even though verbs do not take thematic

arguments.

One should ask the question whether concepts with variable adicities are any less problematic than linguistic predicates with variable adicities. Arguably concepts are prior to linguistic predicates, since many animals appear to have concepts. So if we need concepts and linguistic predicates, concepts need to be acquired in some way or other (see Fodor (2008) for discussion of this, among others). It is not clear that we should expect concepts to be universal, and if they are not, then they have to be acquired by a child. A child will arguably acquire concepts that have various adicities, which is to say that the child has to be sensitive to what kind of adicities concepts have. And then linguists have to ask what the relationship between concepts and linguistic predicates is. They could be isomorphic, or, as the arguments I've reviewed so far indicate, they are not isomorphic and linguistic predicates have a different structure than concepts (see Marantz (1984), Zubizarreta (1987), Pietroski (2008a) for some discussion). However, that does not mean that they do not have some grammatical structure. The Neo-Davidsonian view says that verbs do not have thematic arguments. We need better tests to determine whether the facts above are of a grammatical or a conceptual nature. In order to show that cases like *John arrived Mary are bad for grammatical reasons, we ought to show that their badness correlate with other grammatical phenomena (say movement, extraction, binding etc.). As far as I know, it is very hard to come up with such tests, but future work will hopefully help us address these issues.

I have presented two views here as I think they represent the current state of the field when it comes to these issues. The field is in flux and some researchers think

that the facts reviewed above suggest that we need to hold on to a view where the arguments of a verb are represented on the verb. Others push the Neo-Davidsonian approach and need to appeal to conceptual knowledge. My personal opinion is that the Neo-Davidsonian conceptual story is the more plausible one, but I hope future work will make progress in deciding between the different accounts.

In the next section, I am going to look at some specific counterarguments against full thematic separation.[20]

3.2.4   Williams (2008)

Another way of looking at the issue of verbal adicities is presented in Williams (2008). Williams focuses on patients in Mandarin Chinese and Igbo, and specifically on how patients behave in resultative constructions. Before we can look at the data, I will introduce some terminology.

Resultatives are single clauses that have two predicates, a *means predicate* (M) and a *result predicate* (R). A typical example from English is given in (102).

(102)   Al pounded the cutlet flat.

Here, M is *pound* and R is *flat*. Examples of resultative constructions in Mandarin and Igbo are provided in (103) and (104), respectively (Williams 2008: 6).

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[20]A potential issue arises from manner of motion constructions of the sort shown in (i).

(i)   John walked Mary home.

This sentence displays what is called 'double agentivity' where both *John* and *Mary* are walking, even though *Mary* is a Theme. I am not going to consider these cases here; see Folli and Harley (2006) for comprehensive discussion.

(103) tā tǐ   duàn-le   nàtiáo mùbǎn.
       3s kick snap-PFV that   plank
       'He made that plank snap by kicking.'

(104) Ọ kụ   wa-ra   ọba ahụ.
       3s strike split-FACT gourd that
       'He made that gourd split by striking.'

In (103), M is *ti* 'kick' and R is *duàn* 'snap'. The meaning of the sentence is that kicking caused snapping and that the plank was snapped. M is *kụ* and R is *wa* in (104), and the meaning is that striking caused splitting and that the gourd ended up split.

Williams says that resultative constructions are sometimes analyzed as complex predicates (cf. Dowty (1979) and Larson (1991)) where M does not have any argument positions. Rather, the means verb combines directly with R while it excludes the object. The structure is shown in (105), where linear order is irrelevant.

(105) [Object [V$_{means}$ R]]

Williams assumes that this is the correct structure and points out that we here have a diagnostic to figure out whether arguments are arguments of the verb or not. Let us say we have the two possible denotations in (106)-(107).

(106) ⟦pound⟧ = $\lambda y \lambda e$.pound(e) ∧ Patient(e) = y

(107) ⟦pound⟧ = λ.pound(e)

If we look at (106), when the verb occurs in M it will have an argument that is not immediately saturated. The sister of the verb will be R, which is an expression that does not provide a patient. Thus we expect the complex predicate to inherit the unsaturated argument from M, as shown in (108).

(108) $\llbracket \text{pound} \rrbracket = \lambda y \ldots \text{pound}(e) \wedge \text{Patient}(e) = y \ldots$

This means that the verb should be subject to the same requirement in resultative constructions as in simple clauses. Such an expectation is not created for (107). The patient is not an argument of the verb, which is to say that there is no argument that can be passed on to the complex predicate.

We here have a way to test whether verbs have thematic arguments. If a certain thematic relation obtains regardless of wherever the verb occurs, be it resultatives or simple clauses, then it is likely that the verb introduces this thematic relation. On the other hand, if it does matter where the verb occurs, then it seems likely that the context introduces the thematic relation and not the verb (Williams 2008: 8).

Let us now consider Williams' discussion of Mandarin (Williams 2008: 12-13). The verb *qiē* 'cut' requires an object naming the patient of cutting, as is shown in (109).

(109) Lǎo Wèi qiē-le   zhúsǔn.
       Lao Wei cut-PFV bamboo.shoot
       'Lao Wei cut bamboo shots.'

This means that the following two sentences in (110)-(111) have to be analyzed as including a silent object pronoun that refers to a salient individual in the discourse. Aa Williams (2008: 11) points out, 'They cannot mean simply that there was an event of Lao Wei cutting something, or that there is such an event ongoing'.

(110) *Lǎo Wèi qiē-le.
       Lao   Wei cut-PFV
       Intended: 'I cut' (Can mean: 'He cut *it*.')

(111) *Lǎo Wèi zài   qiē.
       Lao Wei PROG cut
       Intended: 'Lao Wei is cutting.' (Can mean: 'Lao Wei is cutting *it*.')

Williams then points out that when this verb is part of a resultative construction, then there are no such requirements. In (112), the sentence can mean just that the subject made the knife dull by cutting something. There is no noun phrase that tells us what is cut.

(112) tā hái qiē dùn-le nǐde càidāo
       3S also cut dull-LE your food.knife
       'He also made your cleaver dull by cutting.'

It is also not the case that there is room for another object, as (113) demonstrates.

(113) *tā hái qiē dùn-le (zhúsǔn) nǐde càidāo   (zhúsǔn)
       3S also cut dull-LE (bamboo) your food.knife (bamboo)
       'Intended: He also made your cleaver dull by cutting bamboo.'

Rather, an adverbial phrase has to be used to express what was cut. This is shown in (114).

(114) Lǎo Wèi qiē zhúsǔn,   qiē dùn-le   càidāo
       Lao Wei cut bamboo.shoots, cut dull-PFV cleaver
       'Cutting bamboo shots, Wei made the cleaver dull by cutting.'

Lastly, Williams says that the direct object *càidāo* in (112) is not itself an argument of the means verb. It is the instrument of the means event, but in simple clauses, the verb cannot take an instrument as its direct object (115).

(115) *tā qiē   nǐde càidāo.
       3S cut-LE your cleaver
       Intended: 'He cut with your cleaver.'

All these data show that Mandarin behaves exactly as one would predict if the verb

does not have thematic arguments, but the context is the deciding factor. Anyone who wants to maintain that verbs have thematic arguments in Mandarin will be hard pressed to come up with an alternative analysis of these data, as far as I can see.

Williams also argues that patients are arguments of the verb in English, based on the same test that he uses for Mandarin and Igbo. Verbs like *yell* do not differ in terms of the necessity of expressing that which is yelled, as seen in (116)-(117).

(116)   Al yelled.

(117)   Al yelled his throat hoarse.

Verbs like *carry* are different in that their patients cannot be dropped. This is illustrated in (118)-(119).

(118)   Al carried *(the luggage).

(119)   *Al carried his neck sore.

Again we see that a verb behaves similarly in simple clauses and in resultative constructions.

However, as far as I can tell, there is a problem here. If we consider the two transitive verbs *pound* and *cut*, it turns out that they show a difference in behavior. One can say (120) and (121), but not (122).

(120)   Al pounded the cutlet flat.

(121)   Al pounded the cutlet.

(122)   *Al pounded.

Whereas (123) is good, (124) is not.

(123)   Al cut the frozen meat.

(124)   *Al cut the frozen meat soft.

(125)   *Al cut.

In (124), there is a patient, but the resultative construction is still not allowed. Why is that? We can see similar cases in (126) and (127).

(126)   Al carried the luggage.

(127)   *Al carried his luggage/neck sore.

So even if there is a patient, the resultative construction is not allowed. This makes it hard to say that (119) and (11) are bad because the patient has been dropped, since even with a patient, the sentence is no good. Something else must be going on here, though it remains to be worked out what the solution to this issue is.

Williams (2008: 21) argues that his analysis nicely captures the difference between Mandarin Chinese and Igbo on the one hand and English on the other hand. The difference, he argues, is just a matter of lexical valence of verbs. However, if Williams is right, there is a more substantial difference at stake: In English, the patient is always an argument of the verb, whereas in Chinese it does not seem to be an argument of the verb. That would entail that logical forms differ in a substantive way across languages (say, Davidsonian versus Neo-Davidsonian argument association), which has generally assumed not to be the case. Furthermore, the considerations we have seen earlier in this chapter mitigate against such cross-linguistic

differences since I have argued that even in English, there is thematic separation of the patient/theme.

This concludes this section. In the next section, I will look at Kratzer (1996) and her claim that Themes are not severed from the verb. This will be similar to Williams (2008)'s conclusion for English Themes in this section, but I will argue that Kratzer's argument does not go through, even if it has been widely cited and applied in the literature.

3.3   Kratzer (1996) on not severing the Theme

In the previous section, we saw arguments in favor of severing all thematic arguments from the verb. One argument in favor of not severing the Theme has not been discussed so far, namely that of idioms. In this section I will discuss idioms and argue that they do not constitute a strong argument for not severing the Theme.[21]

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[21] Another potential argument for not severing the Theme comes from Tenny (1994)'s observation that only the Theme can be measured out, where 'measuring out' entails that the direct argument plays a particular role in delimiting the event. However, as Borer (2005a) shows, Tenny's observation can be recast in syntactic terms by letting a particular syntactic head encode the property of measuring out. This head combines with certain verbs and arguments to yield the relevant interpretation. Therefore I do not see that Tenny's observation constitutes an argument for not severing the Theme. As Tenny also points out, there are constraints on all arguments: 'Constraints on the aspectual properties associated with direct internal arguments, indirect internal arguments, and external arguments in syntactic structure constrains the kinds of event participants that can occupy these positions.' (Tenny 1994: 2).

Kratzer (1996) starts out by rephrasing the argument in Marantz (1984) which says that external arguments are not arguments of verbs. Marantz observes that there are many cases where the interpretation of the verb depends on the internal argument. Marantz (1984: 25) gives the following examples.

(128)   a. throw a baseball

        b. throw support behind a candidate

        c. throw a boxing match (i.e., take a dive)

        d. throw a fit

(129)   a. take a book from the shelf

        b. take a bus to New York

        c. take a nap

        d. take an aspirin for a cold

        e. take a letter in shorthand

(130)   a. kill a cockroach

        b. kill a conversation

        c. kill an evening watching T.V.

        d. kill a bottle (i.e., empty it)

        e. kill an audience (i.e., wow them)

One could of course argue that these verbs are homophonous, but that seems like a cop-out and it also seems to miss a generalization that one can make, namely that the verb and its internal argument together determine the relevant interpretation (cf.

Marantz (1984: 25)). Furthermore, Marantz (1984: 26): notes that '... the choice of subject for the verbs does not determine the semantic role of their objects'. This is supported by the data in (131)-(132), where the subjects are different but the object could be the same.

(131)   a. The policeman threw NP.

        b. The boxer threw NP.

        c. The social director threw NP.

        d. Throw NP!

(132)   a. Everyone is always killing NP.

        b. The drunk refused to kill NP.

        c. Silence can certainly kill NP.

        d. Cars kill NP.

These facts would all follow if external arguments are not true argument of their verbs, Marantz argues. That is, by excluding the subject from the unit consisting of the verb and the object, we can capture this asymmetry between subjects and objects.

Bresnan (1982) and Grimshaw (1990) take issue with this claim. Their counterarguments are given in (133) and (134).

(133)   In short, one could capture the subject/non-subject generalization without affecting the lexical representation of predicate argument structure, simply by giving the subject a distinguished role as final argument in the semantic composition of the sentence (Bresnan 1982: 350).

(134)   In any theta-marking calculation, the external argument is the last to enter

in. Thus, in effect, calculations performed over the internal arguments are

done without reference to the external arguments, but any a-structure calcu-

lation involving the external argument will of necessity involve the internal

ones. The special properties of externals follow from their occupying the

position of maximal prominence (Grimshaw 1990: 35).

The problem with this reasoning is that it does not ensure that the external argu-

ment does not trigger a special interpretation of the verb. There is no technical

obstacle to formulating such a rule, as Kratzer (1996: 115) notes. She gives the ex-

amples in (135) (Kratzer 1996: 115), where the highest argument triggers a specific

interpretation of the verb.

(135)   a. If b is a time interval, then f(a)(b) = truth iff a exists during b.

b. If b is a place, then f(a)(b) = truth iff a is located at b

c. If b is a person, then f(a)(b) = truth iff b is the legal owner of a.

Kratzer takes issue with the position stated by Bresnan and Grimshaw. Although

Bresnan and Grimshaw are probably right that you do not need severed external

arguments to get an asymmetry between external and internal arguments, Kratzer's

point is that we get a more adequate theory if we sever the subject. She uses the

Marantz data to develop a specific syntactic and semantic theory where the Agent,

but not the Theme, is severed from the verb.

Note, however, that Kratzer's argument only goes through if the specification

of the verb's meaning only refers to the internal argument, and furthermore, if

idiomatic dependencies like these can be captured by defining the meaning of the verb. Kratzer discusses the first premise but not the second. She seems to assume that idiomatic dependencies must be specified over objects in the lexicon, that is, over the verb and its Theme. However, we will see below that Marantz (1997) has a different view (see also Harley (2009)), namely that idiomatic dependencies can be defined over outputs of syntax, in which case Kratzer's argument would not go through.

Recall that for Kratzer, idiomatic dependencies are stated over function-argument relations in a single lexical item, i.e., the verb. Marantz (1997: 208) has a very different view as he argues that 'The syntactic head that projects agents defines a locality domain for special meanings. Nothing above [v_{AG}] can serve as the context for the special meaning of any root below this head, and nice versa'.[22] The quote refers to the structure in (136).[23]

(136)

vP
DP v'
    v_{AG} VP

---
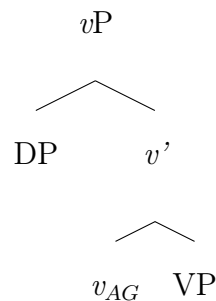
[22]See also Harley (2009) and Bowers (2010) for a somewhat similar view of idiomatic dependencies.

[23]There has recently been a lot of discussion on how to capture 'special meanings' within Distributed Morphology. I will not review the debate here, but see Arad (2003), Marantz (2001), Harley (2009), Borer (2009), Embick (2010) for different perspectives.

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Marantz (1997: 208-209) points out that this view makes three predictions. They are listed in (137)-(139).

(137)   No idioms with fixed agents (root in agent position, context for special meaning within VP).

(138)   No eventive-passive idioms, but possible non-eventive stative idioms.

(139)   No idioms with causative morpheme and lower agentive verb, but possible idioms with causative and lower non-agentive verb.

The first prediction is a slightly more refined version of Marantz (1984), which I have discussed above. The prediction is borne out, Marantz argues, and points towards examples such as (140), where the idiom is non-agentive.[24]

(140)   The shit hit the fan.

This is the only point where Kratzer and Marantz agree. The two other predictions are predictions that Kratzer cannot make in her system, so to the extent that these predictions are borne out, Kratzer cannot capture them.

The second prediction is borne out, which we can see by considering the differences between 'adjectival (stative) passives' and 'syntactic (eventive) passives'. The former are created with a functional head merging below the v head that projects the agent, while the latter are formed with a functional head merging above or

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[24]Similar examples are provided by O'Grady (1998: 298) and Bruening (2010: 535), putting forward data such as *fortune smiled on X, the ceiling caved in on X, the bottom fell out on X, time's up for X.* As Bruening points out, some of these might be unaccusative, but *smile on* is probably not, he claims.

as the head that projects Agents. Marantz points towards data from French and Chichewa that show this. Here I will look at the Chichewa data, which Marantz (1997: 210) cites from Dubinsky and Simango (1996). Note that this language has different suffixes for passives and statives.

(141) Chimanga chi-ku-gul-idwa   ku-msika.
      corn   AGR-PROG-buy-PASS at-market
      'Corn is being bought at the market.' [no idiomatic reading, and none possible with passives]

(142) Chimanga chi-ku-gul-ika   ku-msika.
      corn   AGR-PROG-buy-STAT at-market
      'Corn is cheap at the market.' [idiomatic reading of *buy* in the context of STAT]

(143) Chaka chatha chimanga chi-na-lim-idwa.
      year last   corn   AGR-PROG-cultivate-PASS
      'Last year corn was cultivated.'

(144) Chaka chatha chimanga chi-na-lim-ika.
      year last   corn   AGR-PROG-cultivate-STAT
      'Last year corn was beautiful.'

Only statives can have idioms; passives cannot. Kratzer's approach cannot capture this because on her approach, it should not matter whether the arguments that verbs take are active or stative.

Let us now look at the last prediction, (139). Building on Ruwet (1991), Marantz notes that a causative construction in English may not be idiomatic unless the lower predicate is non-agentive. This is illustrated in (145)-(148).

(145) Make oneself scarce.

(146) Make X over.

(147)   Make ends meet.

(148)   *Make X swim/fly a kite

The examples in (145)-(147) are all non-agentive whereas the example in (148) is agentive and consequently does not have an idiomatic reading.

Lastly, there are verbs that can take part in multiple idiom patterns. Bruening (2010: 536) gives the following examples for *give*.

(149)   give X the creeps

(150)   give rise to X

If the idiomatic interpretation is specified on verbs, two lexical specifications for *give* seem to be necessary; one for each idiom structure. If one is in for polysemy, that is a possible analysis, but as I have argued above, we should resist this, cf. Borer (2005a,b), Boeckx (2010). Bruening also argues that we need a theory of idiom formation that explains the lack of logically possible idioms such as (151), where the asterisk means that an idiomatic interpretation is missing.

(151)   *give the wolves X

I will not attempt to develop such a theory here; the goal is simply to show that Kratzer's theory is inadequate to account for the complexities of idiomatic dependencies. See Bruening (2010) for one attempt at developing a comprehensive theory of idioms.

All these arguments suggest that Kratzer's argument from idioms does not carry much force. It should be clear that idioms present difficult theoretical chal-

lenges, but to the extent that they tell us something, they do not seem to provide an argument for not severing the Theme.

If these arguments are on the right track, they raise important questions about the syntactic representations and more generally about the interface between syntax and semantics. In particular, they question our assumptions about how Agents, or External Arguments more generally, are represented syntactically such that their interpretation is derived in a transparent fashion. Based on Marantz (1984), this issue has become important in recent years, e.g., in the work of Hale and Keyser (1993, 2002) Harley (1995), Kratzer (1996), Marantz (1997), Borer (2005a,b), Alexiadou et al. (2006, In Progress), Folli and Harley (2007), Pylkkänen (2008) and Ramchand (2008). In the next chapter, I will discuss how the syntax should look like for logical forms that respect full thematic separation.

3.4 Conclusions

The goal of this chapter was to present a host of arguments against the widespread assumption that verbs have thematic arguments. The arguments have been drawn from, among others, facts about distributive readings, focus, and variable verbal adicity. A number of counter-arguments have also been addressed, in particular involving idioms, and I have argued that these arguments do not undermine the arguments in favor of severing thematic arguments from the verb.

The next chapter will develop a syntax and a theory of the syntax-semantics interface that transparently give us a logical form that respects full thematic sepa-

ration.

Chapter 4

A Syntax for Full Thematic Separation

In the previous chapter, I argued in favor of full thematic separation. The goal of this chapter is to tie chapters 2 and 3 together and provide a syntax that maps transparently onto logical forms where all thematic arguments are severed from the verb. Specifically I will argue that an argument is semantically tied to a head iff it is a sister of that head.

After I have outlined the syntax in the first part of the chapter, I will discuss the nature of the mapping principle I assume. I will argue, following Neo-Davidsonians, that conjunction is the main principle that works together with what I will call 'thematic integration' and existential closure. Finally, I conclude the chapter and set the stage for chapter 5.

4.1 Introduction

In the previous chapter, I discussed a number of arguments for full thematic separation in English and in other languages. Hopefully it is clear that there are phenomena that exhibit full separation, though as we have seen, not every semantic fact will show separation. They raise a number of interesting questions, and in this chapter, I will try to answer one of these, namely what kind of syntax full thematic

separation requires.[1]

4.2 The main idea

The core idea that I will be pursuing is that each application of Spell-Out corresponds to a conjunct in a logical form. Correspondingly, if we want full thematic separation in the logical forms, we need each argument and the predicate to be spelled out separately. I will put forward a view of syntax that achieves this. Importantly, the syntax that I will suggest is independently motivated by the discussion in chapter 2 as the syntax does not make a categorical distinction between specifiers and complements. My proposal will build on insights in Starke (2004), Narita (2009, 2011), and Chomsky (2010), but it differs quite substantially in technical implementation and conceptual motivation.

I will start by going through an example of my proposal and then develop it in more detail. Let us therefore look at the argument domain of a transitive sentence. I am here following Borer (2005a,b) in having the verb phrase merged below all arguments (see also Uriagereka (2008) for related discussion). This is not crucial, but what is crucial is that all the arguments are introduced in different projections from the verb. So if one e.g., would want the VP to be merged above the direct

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[1]Larson (Forthcoming) argues that a Neo-Davidsonian analysis implies that the Theta Criterion, if it is correct, must be a purely syntactic condition that governs a purely syntactic notion of selection. I take the discussion in this chapter to confirm this, though I go further and suggest that the Theta Criterion is not needed as a syntactic constraint. Larson's view faces Borer (2005a)'s redundancy argument, which I consider to be very powerful, cf. chapters 1 and 3.

object, there is nothing that prohibits that. I will return to this issue in a slightly different form in chapter 5 when I discuss serial verbs.

I make the following assumptions.

The syntax does not make a categorical distinction between specifiers and complements, cf. Hoekstra (1991), Starke (2004), Jayaseelan (2008a), Chomsky (2010). The main syntactic relation, modulo adjuncts, is that of a merged head and a non-head, and whether we call this a head-complement relation or a specifier-head relation does not really matter. To make this very clear, one *can* define specifiers and complements as follows:

(1)   A complement is the sister of a head.

(2)   A specifier is the sister of a head.

However, at this point, there is really no point in providing such definitions. Since there is no difference between specifiers and complements, we can just define the core syntactic relation as a merged head and non-head. How exactly we choose to label that relation should not be important.

In order for these definitions to apply, it is necessary to rethink the units of Spell-Out. I am going to do this by proposing a constraint on the kinds of representations that can be generated. The constraint looks as follows.

(3)   *[XP YP].

(3) is a derivational constraint that bans two elements that can only be phrases from being merged. Here I understand a phrase as a maximal projection, and I adopt Chomsky (1995c: 242)'s definition of the latter:

(4)   A maximal projection is a projection that does not project further

I take no position on the specific nature of the constraint in (3) other than that it has to be derivational (pace Moro (2000)); see Speas (1990: 48), Uriagereka (1999), Alexiadou and Anagnostopoulou (2001, 2007), Richards (2010b) and Chomsky (2008, 2010) for much discussion. Whenever the grammar would be confronted with a configuration like (3), the grammar will resolve the conflict by making sure that instead of two phrases merging, a head and a phrase are merged. Spell-Out enables this reduction in a specific way that I will discuss below. Note that a similar logic has been used by Epstein (2009) and Epstein et al. (In press), where Spell-Out fixes an otherwise illicit representation. However there is a difference: For them, you can generate the representations and then Spell-Out can fix it. For me, you cannot generate the relevant representation at all.

For now, let me continue to show how we can create a mapping from the syntax and onto logical forms that exhibit full thematic separation if we assume (3).

I assume that all arguments are introduced by functional projections, as in Lin (2001), Borer (2005a,b), Bowers (2010).[2] A problem for these kind of approaches, one may think, is that it is typically claimed that the object and the verb have a relationship that does not hold of the subject and the verb. That is, the object and the verb constitute a unit to the exclusion of the subject for processes like VP-deletion, VP-pronominalization and VP-fronting. A few relevant examples are given in (5)-(8), taken from Baker (1997).

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[2]As we will see below, this includes in a sense event arguments too, or at least, the mereological relation between events when there is more than one event in a sentence.

(5) John [$_{VP}$ hit the table] and Bill did [$_{VP}$ (so)] too.

(6) John said he would hit he table, and [$_{VP}$ hit the table] I guess he did.

(7) *[$_{XP}$ John hit] the table and [$_{XP}$ (so)] did the chair.

(8) *John said he would hit the table, [$_{XP}$ John hit] I guess did it.

Clearly, these data need a different account if the object does not bear a special relationship to the verb. I assume that the verb will move through the functional heads F and Voice, which means that the verb will still be close to both the object and subject. However, more importantly, the verb will always have to move on its own, even in cases of VP-fronting, as discussed in chapter 5. This means that an analysis of VP-fronting has to ensure that the verb has to appear before anything else in such cases. A feature ensuring that the verb is highest in the left periphery would ban a case like (8) and allow (6). We also need a rule that says that the object and the verb can be deleted, but not the subject and the verb. This can be formulated by using features on the relevant heads that I will now introduce.

The next assumption is that Agents are introduced by Voice^0, cf. Kratzer (1996), Alexiadou et al. (2006). I am using this label, though it should be clarified that the label does not really matter; see Chomsky (1995c), Harley (1995), Folli and Harley (2007), Pylkkänen (2008), Ramchand (2008), Sailor and Ahn (2010) for discussion.[3]

Themes are also introduced by functional heads. Here I am just going to label

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[3] I assume that Agents and Experiences have a somewhat different syntax, and that this in part accounts for the different interpretations. See Landau (2010) for much recent discussion that can be applied to the present theory.

the relevant head F^0, for lack of a better name. Below I will elaborate on how one can provide mapping principles based on the nature of the functional head.

The verb is generally merged prior to all functional projections as in Borer (2005a,b), Bowers (2010). This has to be the case in order to make sure that the verb is spelled out in a separate conjunct, though there is an alternative, as mentioned in chapter 5.6. Note that Travis (2010) argues that this is too simplistic. I will not discuss Travis' arguments here, but they can easily be accommodated into the present framework. The important part that cannot be given up is that the verb is spelled-out independently of all the thematic arguments.[4]

Based on these assumptions, let us look at a standard transitive sentence such as (9).

(9) The students read the books.

This sentence typically has the structure in (10). I am following Borer (2005a,b) and Bowers (2010) in assuming that the VP is below all arguments.[5]

---

[4]Pylkkänen (2008: 84) suggests that all causative constructions involve a Cause head, which combines with noncausative predicates and introduces a causing event to their semantics. I won't be specifically dealing with causatives here, but in those cases, her proposal can easily be adopted.

[5]For expository convenience, I am using a VP here. It could also be a root and a v categorizer, as in section 5.6.

(10)

```
                          VoiceP
                         /      \
                The student      \
                          /       \
                       Voice       FP
                                  /   \
                            the books  \
                                     F   VP
                                          |
                                        read
```
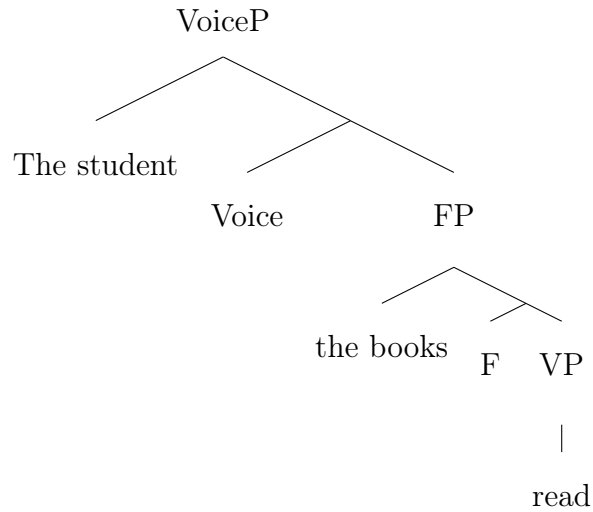
I am now going to discuss how this structure gets built derivationally and we will see that in the syntax, a structure like (10) will never exist as a representational object. Rather, the structure will correspond to chunks that are generated and spelled out. Here is the derivation for the sentence in (9).

First, F merges with the VP *read*. This is shown in the following structure.

(11)

```
        FP
       /  \
      F    VP
            |
          read
```
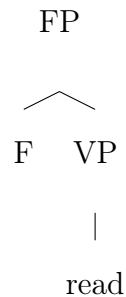
The next step in the derivation is for *the books* to merge with FP. The constraint in (3) bans two phrases from being merged so such a merger cannot take place. In order for merge to happen, Spell-Out applies. Spell-Out prunes the structure such that the complement of F is spelled out, i.e., the VP. Because of the relational character of Bare Phrase Structure (Muysken 1982, Chomsky 1995c), F is now a head and can merge with the phrase *the books* (see below for much more discussion

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of this). That is, Spell-Out results in *pruned structures* where nothing is left in F's original complement after Spell-Out. (12) shows the structure after Spell-out and merger of the Theme. Note that I assume that F and FP are completely identical. I am just using different labels for expository purposes. This implies that one cannot say that F and FP have different adicities, contrary to many semantic theories.

(12)
$$
\begin{array}{c}
\text{FP} \\
\diagup\diagdown \\
\text{books} \quad \text{F}
\end{array}
$$

The next element to be merged is the Voice head (13).

(13)
$$
\begin{array}{c}
\text{VoiceP} \\
\diagup \qquad \diagdown \\
\text{Voice} \qquad \text{FP} \\
\diagup\diagdown \\
\text{the books} \quad \text{F}
\end{array}
$$

Then we again face the situation that I described above. *The students* needs to merge with Voice, but this cannot happen due to the by now familiar constraint (3). In order to remedy this, the complement of Voice in (13) needs to be spelled out, that is, FP needs to be spelled out. After Spell Out, *the students* can then merge with Voice, as shown in (14).

(14)
$$
\begin{array}{c}
\text{VoiceP} \\
\diagup \qquad \diagdown \\
\text{the students} \quad \text{Voice}
\end{array}
$$

The VoiceP in (14) can now be merged with further heads, but as soon as a new phrase is supposed to be merged, Spell-Out will be triggered again. Let us for

concreteness move the subject to the canonical subject position, which in English I take to be SpecTP.[6] First T merges with VoiceP, creating a TP, as shown in (15). When the subject *the student* moves, Spell-Out is triggered again, so that we end up with (16).[7]

(15)

```
                    TP
                   /  \
                  T    VoiceP
                        /  \
                the students  Voice
```

(16)

```
                 TP
                /  \
        the students  T
```
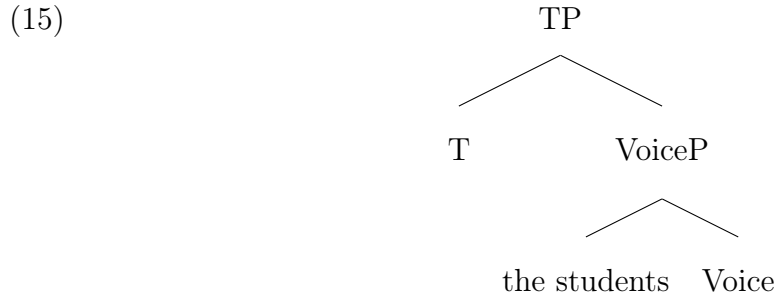
It is necessary for the adjunction to T to create a Spell-Out domain in order for a conjunct to be created at logical form. There is also independent phonological evidence that the subject needs to be in its own domain, see Samuels (2011) for discussion.

An immediate consequence of the current system is that in sentences like (17), just like the nominal phrase *the food*, the PP *on the table* cannot be the complement of the verb.[8]

---

[6]Below I will elaborate on this movement operation, but to foreshadow, I will argue that movement is adjunction in this framework.

[7]On this approach, every phrase will be merged adjacent to a head (Narita (2009, 2011), cf. also Kayne (2010).)

[8]Thanks to Mark Baker (p.c.) for raising this issue.

(17) She put the food on the table.

The reason is that the PP will then be spelled out together with the verb, which will not yield the PP as a separate conjunct in logical form. For the latter to happen, *on the table* has to be a sister of a functional projection that is merged above the verb.[9] That is, the structure has to be as follows (I am not showing the Spell-Out domains for the sake of exposition).

(18)

```
            FP
          /    \
   the food      FP
              /      \
            F          GP
                     /     \
             on the table    GP
                             /\
                            G  VP
```
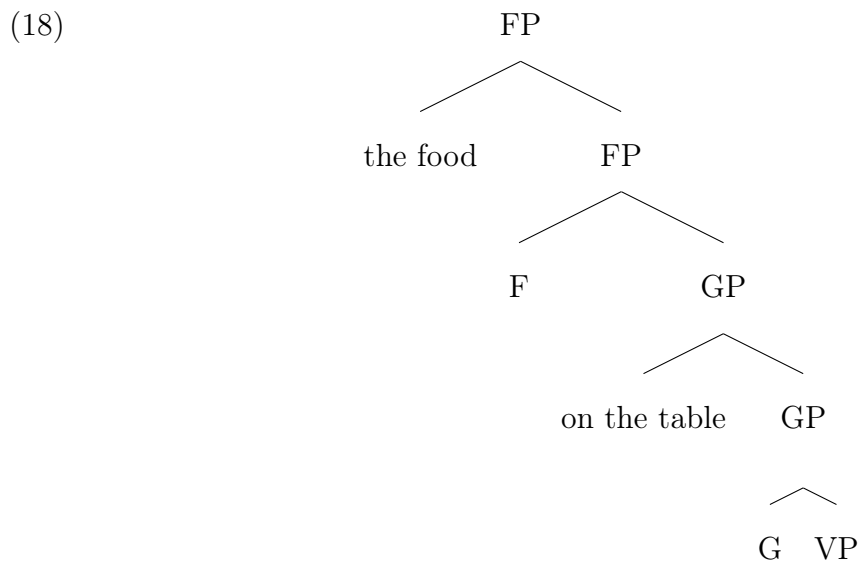
See Bowers (2010) for extensive empirical arguments that the latter analysis is the most viable one, which requires the verb to move in order to obtain the correct linear order (see already Koizumi (1995) for arguments that this is indeed the case).[10]

A further consequence is that complement clauses such as (19) need a different syntactic analysis than what is commonly assumed.

(19) John thinks that Mary left.

---

[9] I will say more later about what it means to be an adjunct.

[10] See also Adger (In press) for a new theory of PPs whose syntax is abstractly similar to the one here.

Here is a view of the entire structure, without the Spell-Out domains, just to illustrate the structure.

(20)

```
                      TP
              ┌────────┴────────┐
           John            ┌────┴────┐
                           T       VoiceP
                              ┌───────┴────────┐
                            ̶J̶o̶h̶n̶         ┌──────┴───────┐
                                      thinks           FP
                                              ┌─────────┴──────────┐
                                             CP                 ┌──┴──┐
                                        ┌─────┴─────┐           F    VP
                                      that         TP                │
                                            ┌───────┴──────┐       ̶t̶h̶i̶n̶k̶s̶
                                          Mary         ┌───┴────┐
                                                       T      VoiceP
                                                          ┌─────┴─────┐
                                                        ̶M̶a̶r̶y̶   ┌──┴──┐
                                                              left   VP
                                                                     │
                                                                    ̶l̶e̶f̶t̶
```
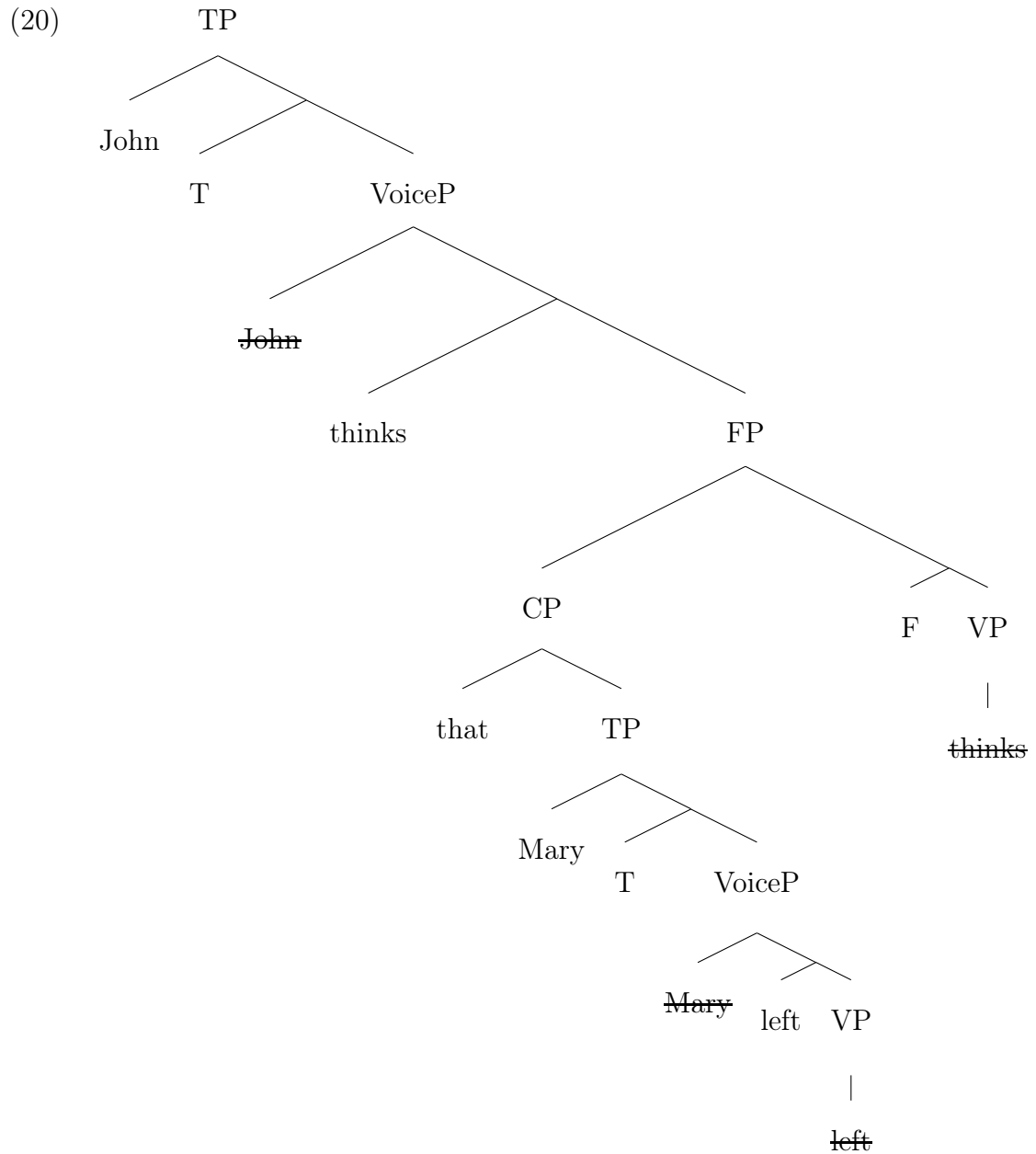
Here, the complement clause is not a complement of the verb, but rather introduced by F.

I will now discuss the mapping principles between syntax and semantics and also what the semantic composition principles are.

4.3 Mapping syntax to semantics

The goal of this section is to show how the syntax I have just outlined provides a relatively transparent mapping onto logical forms. The core idea is that an application of Spell-Out corresponds to a conjunct at logical form. I will argue that this is the most transparent mapping if one assumes that conjunction is the basic composition principle. Below I will argue that a mapping that assumes that each Merge corresponds to conjunction won't give us the correct logical forms. That is, there will have to be constraints on what can serve as a possible mapping, and these constraints will in part be guided by what the logical forms are.

In section 4.3.1 I will present my proposal and in section 4.3.2 I will discuss a couple of alternatives. In sections 4.3.3-4.3.5 I will discuss the composition of conjunctivist logical forms.

4.3.1 A transparent mapping

In order to see how a typical derivation would run, let us consider a slightly shorter version of Schein (1993)'s sentence.

(21)   Three video games taught every quarterback.

Below are the three steps of the derivation. I have used the derivations we have seen already and just added the mapping to logical form. The arrows signal what the logical translation of the boxed syntactic structure (Spell-Out domains) is.

(22) FP

F | VP
|
teach
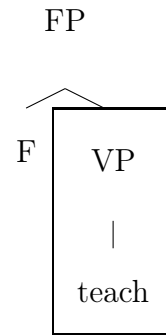
(23) $\Longrightarrow$ teach(e)

This is the first step of the derivation. The verb somehow becomes a phrase and merges with the F head.[11] As discussed in chapter 1, one can either say that the event variable belongs to the verb in the lexicon, or that it is acquired through the merger of a root with a categorizer.

The next step is to merge the Theme *every quarterback* with the FP. When the Theme is to be merged into the structure, the complement of the F head has to be spelled out. This complement is the VP, and it is in a box in the syntactic tree. This box corresponds to the logical form given in (23). When the Theme is merged, the derivation continues as follows, with merger of the Voice head.

---

[11]Below I will say more about the nature of the F head.

(24)

VoiceP

Voice   FP

QP   F

every quarterback
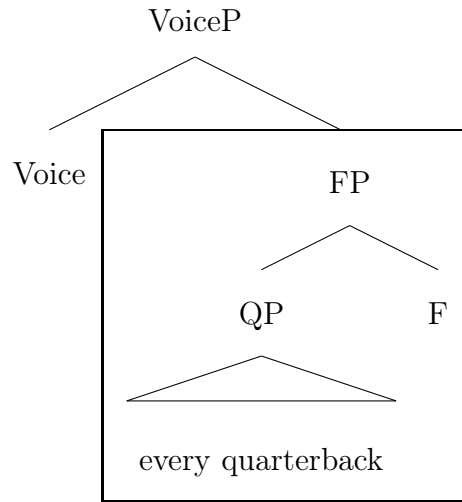
(25) $\implies$ [every y: Qy] [$\exists e'$: $e' \leq e$](Theme(e', y))

The FP will be interpreted as in (25). Here the quantifier outscopes the mereological relation. There are two ways in which the mereological relation can enter the structure. The first option is to put it into the QP. In order to obtain the correct scope relation, the general structure of the QP would have to look roughly as follows.

(26)

every

quarterback $\exists e'$: $e' \leq e$
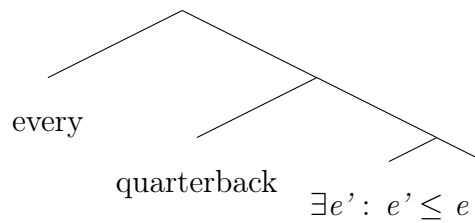
There are many complicated issues surrounding the internal architecture of QPs, so I will not go into their structure here. I simply want to note that this is an alternative. Another alternative is to stipulate syncategorematicity and say that the QP is interpreted as '[every y: Qy] [$\exists e'$: $e' \leq e$]'. Both these proposals leave *every quarterback* as a constituent and treat *every* as taking a covert event quantifier argument. Again, I just want to note the alternatives and not choose between them here.

As far as the event variable on the thematic relation is concerned, I assume that thematic predicates are born with an event variable. That is, that is part of how they are understood when we understand their meaning (for example, we need to know how we understand the Agent predicate). For the Theme relation in this derivation, we need an *e'* as opposed to the ordinary *e*. I assume that when F merges with a QP that contains an *e'* that is closed, then this is the event variable that is part of the thematic predicate. This is a way of saying that the merging itself introduces and closes the relevant variable.

Returning to the main derivation, when the Agent is to be merged, the complement of Voice has to be spelled out. This complement corresponds to the box in the tree structure, and it has the logical denotation in (25). The derivation can then continue and the Agent can be merged.

(27)

TP
├── T
└── VoiceP
    ├── QP
    │   └── three video games
    └── Voice
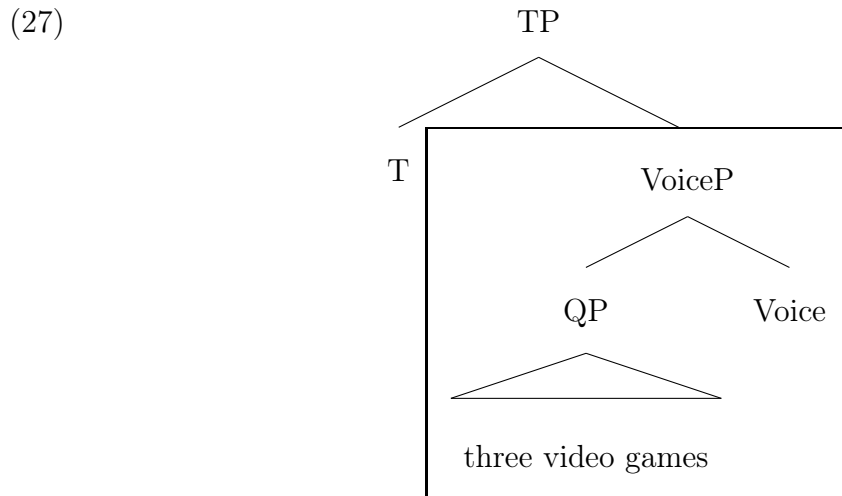
(28) $\implies [\exists X\colon 3(X) \land \forall x(Xx \to Gx)](\text{Agent}(e,\, x)$

The T head is merged, and the next Spell-Out domain is the domain that is boxed in the tree structure. This domain arises when the subject moves to merge with T. The Agent predicate contains an *e* variable, since there is no information that

indicates that any other event variable is required, cf. the discussion of the Theme above.

I assume that the Spell-Out domains are added to a stack, so that at the end of the derivation, these domains are all conjoined by the semantic composition principle Conjunction. This gives us the following:

(29) $[\exists X: 3(X) \wedge \forall x(Xx \rightarrow Gx)](\text{Agent}(e, x)$

   $\wedge$ [every y: Qy] $[\exists e': e' \leq e](\text{Theme}(e', y) \wedge \text{teach}(e)$

At the end, existential closure is added, and we end up with the following logical form:

(30) $\exists e([\exists X: 3(X) \wedge \forall x(Xx \rightarrow Gx)](\text{Agent}(e, x)$

   $\wedge$ [every y: Qy] $[\exists e': e' \leq e](\text{Theme}(e', y) \wedge \text{teach}(e))$

We need these two steps - conjunction and existential closure, since in some cases, existential closure takes place on only a subset of the conjuncts. This is the case when we have a strong quantifier in subject position as in a sentence like (31).

(31) Every student ate pizza.

Here there can either be one eating event or there can be many eating events. This can be captured by letting the strong quantifier *every student* scope either inside or outside of the event quantifier. The same happens with strong quantifiers in object position. An example is given in (32) from Taylor (1985: 17), where there is a strong quantifier in the object position.

(32) Henry gracefully ate all the crisps.

As Taylor points out, this sentence is ambiguous. We can list the two meanings as follows.

(33) Each and every crisp was gracefully eaten by Henry.

(34) Henry's crisp-eating style had overall grace.

An event-based framework can make sense of this ambiguity since (33) corresponds to predicating gracefulness of each of Henry's individual crisp-eatings, and (34) corresponds to predicating gracefulness of an event formed by summing the individual crisp-eatings to obtain a further crisp-eating of Henry's (Taylor 1985: 17). The logical forms that Taylor (1985: 17-18) gives are the following.

(35) $(\forall y)(\mathrm{Crisp}(y) \to (\exists e)(\mathrm{Eat}(\mathrm{Henry},\ y\ \mathrm{uniquely},\ e)\ \&\ \mathrm{Graceful}(e)))$

(36) $(\exists e)((\forall y)(\mathrm{Crisp}(y) \to \mathrm{Eat}(\mathrm{Henry},\ y,\ e)\ \&\ \mathrm{Graceful}(e))$

These logical forms demonstrate the way in which the existential event quantifier can interact with the strong quantifier.

For strong quantifiers in both object and subject position, we thus observe an ambiguity with respect to the event quantifier. This appears to correspond to when the existential quantifier is inserted: either after conjunction has happened, or before conjunction has finished conjoining all the predicates. This is essentially a way of saying that insertion of existential closure is free. I will get back to that below and some predictions that the current system makes.

We see that the mapping relies on a given syntax plus translations of the syntactic terminals into a favored logical language. I am here assuming the logical notation provided in the works I am citing. It is of course an independent empirical

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question how exactly we should render the denotation of *every* and other lexical items.

I want to emphasize that the order of the functional projections and the Spell-Out domains need to be as described above.[12] There are various ways one could implement this, but it seems like it is necessary to assume a universal sequence of functional projections (Cinque 1999, Starke 2004). It does not work to say that the sequence can be freely generated and independent principles filter out the wrong sequences. We want to understand why these meanings are not attested, so the absence of a meaning cannot be a filter at the conceptual-intentional interface. Therefore I am going to assume that the hierarchy is universal, leaving aside the question of why that order is universal as opposed to some other order.

4.3.2   Alternative mappings

In this subsection I will discuss two alternative mappings. The first one I will consider is one that makes the Spell-Out domains smaller, and the second one is a mapping that involves 'lexical' rules rather than Spell-Out.

The first alternative that I will consider is one which holds that each applica-

---

[12]Semantically we would get the same results if the Agent was first merged at the bottom of the tree, which is expected since the thematic role in no way depends on the verb. Sigurðsson (2006) argues that this is indeed the case for reasons having to do with Case and the binding theory; see also Bowers (2010). However, there are syntactic arguments that this is not plausible, so intervention effects would block the subject from moving across the object in a standard subject-raising configuration. That is, independent syntactic principles will filter out those sequences that are not good.

tion of Merge corresponds to a conjunct. Based on the syntactic structure above, nothing would really go wrong with such a principle. However, it would create problems for the Theme QP *every quarterback*. If every merge corresponds to a conjunct, it predicts that the quantifier and its restriction should be in different conjuncts. That is, instead of (37) as the denotation of the QP, we may instead get (39) if the syntactic structure is as in (26) above, repeated here for expository convenience.

(37) [every y: Qy] [$\exists e'$: $e' \leq e$]

(38)

every

quarterback

$\exists e'$: $e' \leq e$
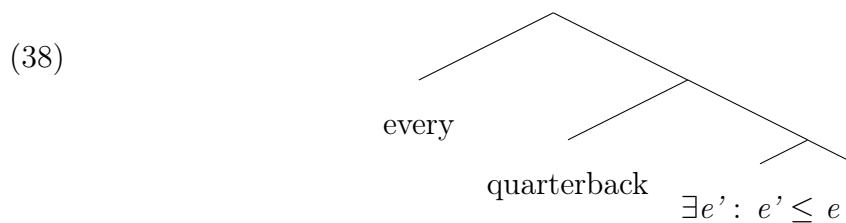
(39) [every] & [y: Qy] & [$\exists e'$: $e' \leq e$]

I say *may* because what happens here very much depends on specific assumptions about the structure. But with this rough structure depicted here, each of the three elements should be in separate conjuncts. And even if one jettisons the mereological relation from the syntactic structure, there is still a conjunct separating *every* and *quarterback*. With such additional conjuncts, one is lead to expect that one can delete them and get an entailment relation that is preserved. However, *every quarterback* does not entail *every* in the sense that *Jones buttered the toast quickly* entails that *Jones buttered the toast*, so this does not work.

Another possibility is to say that each phrase constitutes its own interpretational domain. By interpretational domain I only mean that the phrase gets a specific interpretation, but that there is no Spell-Out in the sense that I have pro-

posed above. Put differently, what we are considering is how conjunctive logical forms can be generated *without* the specific syntax that I have proposed. The following discussion still presupposes that the main semantic composition principle is conjunction and that each interpretational domain is added to a stack that then gets existentially closed, as discussed above.

For purposes of this discussion, I assume that we have a conventional syntax without Spell-Out pruning the structure. I also assume that each argument is introduced by a functional projection. If that is the case, it is possible to invoke mapping rules such as the following (Baker 1997):

(40)   SpecVoiceP → Agent(e, DP)

(41)   SpecFP → Theme(e, DP)

However, in chapter 2 we saw that Bare Phrase Structure comes with multiple specifiers, in which case it will be hard to know which specifier to look at, say, if *wh*-movement happens by adding specifiers to the Voice head, as in the following example.

(42)   What did John read?

(43)

```
                    TP
                  /    \
                 T     VoiceP
                      /    \
                   what     \
                      /    \
                   John      \
                      /    \
                  Voice      FP
                           /    \
                       ~~what~~   \
                              F    VP
                                    |
                                  read
```
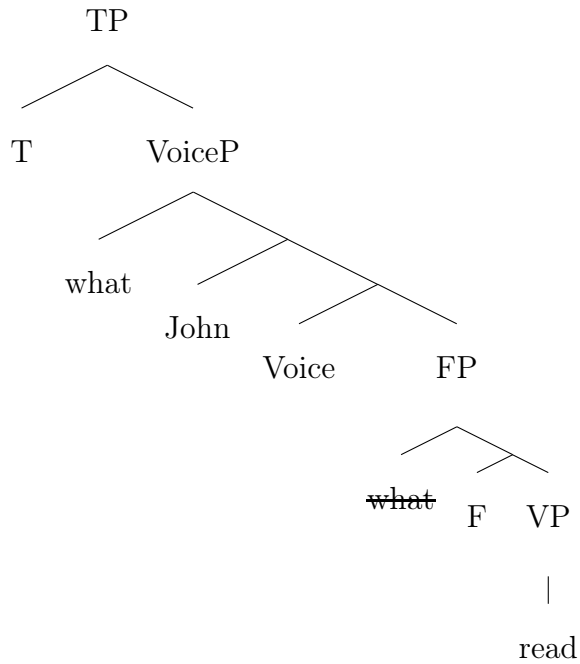
As this tree shows, it is hard to know which specifier of Voice (40) is supposed to pick out, since the grammar arguably does not keep track of the first and second specifier. That is to say, the grammar does not count, so it is impossible to say that the first specifier and the first specifier only gets mapped onto a relevant thematic predicate. Either the mapping rules are wrong, or the syntax needs to somehow change so that the mapping rules can be utilized.[13] Let us consider each of these options in turn.

If the mapping rules are wrong, we need to come up with different mapping rules. It may be possible to say that interpretation happens prior to movement, so that when *what* moves, the thematic predicates have already been determined by principles such as (40)-(41). One could say that the thematic part of the sentence constitutes a phase, whereas the rest of the sentence constitutes a different phase.

---

[13]This argument would not go through were one to deny the existence of multiple specifiers and claim that there is a stipulation that bans such phrasal configurations.

If that is the case, it would entail that we have a two-stage model of interpretation, where first the thematic part of the sentence is interpreted and then the rest of the sentence. This would effectively amount to encoding the duality of semantics thesis stated in Chomsky (2004). This thesis holds that thematic relations are interpreted one way and scopal/discourse relations are interpreted differently. In an abstract way, this relates to the distinction between Force and Content stemming from Frege; see Lohndal and Pietroski (2011) for more discussion.

An alternative is to invoke an extra level where the syntactic representation has been adjusted. One way to do this is to translate the tree in (43) into a tree where the intermediate *wh*-element is eliminated. This would be reminiscent of Montague (1974a)'s analysis tree.

(44)   What did John read?

(45)

```
                    TP
                  /    \
                 T     VoiceP
                      /     \
                   John      \
                        Voice   FP
                              /    \
                          ~~what~~  \
                                   F   VP
                                        |
                                       read
```
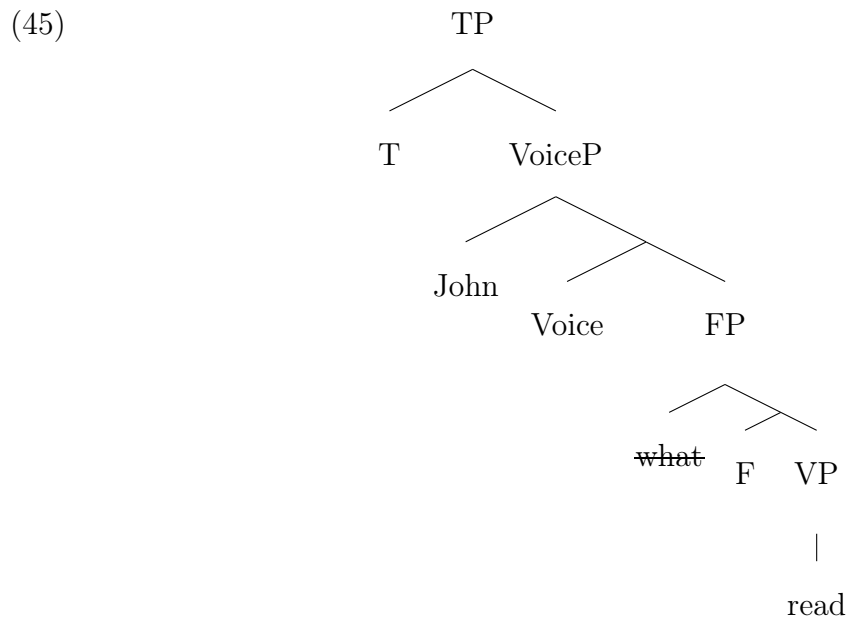
Given this tree, it is possible to use the principles in (40)-(41).[14]   But I see no

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[14]Interrogatives present their own problems, but it is a common assumption that it is the head

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other way of getting from (43) to the tree that will be required for interpretation. Furthermore, it is not clear to me how this would translate into, say, languages with multiple subjects where these subjects are all specifiers of the same head. Note, though, that the alternative I have just outlined entails that specifiers are necessary as objects that the grammar operates on.

Yet another approach would be to involve a type-driven lambda approach, where the conjuncts are determinants of the denotation of the syntactic elements. Such an approach would be able to yield thematic separation without problems (see Champollion (2010c) for a concrete example), though it does not hold that conjunction is the main semantic principle. Furthermore, Schein (1993) and Pietroski (2005a) have argued at great length that a conjunctivist approach is superior to approaches that are type-driven and where the main principle is functional application (see also Partee (2006) for raising the question why semantics is type-driven). See section 4.3.4 for some more discussion.

4.3.3 Conjunction

I have already adopted the hypothesis that conjunction is the main composition principle, cf. Schein (2003, In press), Pietroski (2005a, Forthcoming). I have tacitly assumed that there is only one '&' for logical forms, though I have not been explicit about which one. I will now discuss this issue.

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and the tail of a 'wh-chain' that matter for interpretation.

Schein (In press) shows in very detailed ways that one & is a sustainable view despite appearances to the contrary. A common concern is whether we are dealing with the same kind of conjunction in the following two examples.

(46)   John reads a book and Mary reads a book.

(47)   John and Mary read a book.

Schein defends the view that both these conjunctions are sentential connectives in logical forms. He points out that an event-based semantics makes such an analysis possible. Consider the following contrast, taken from Schein (In press).

(48)   At Acropolis Pizza, the sauce and the cheese are a perfect marriage of two rivals.

(49)   *At Acropolis Pizza, the sauce is a perfect marriage of two rivals, and the cheese is a perfect marriage of two rivals.

We can maintain a sentential connective if the connective connects clauses about the cheese's and sauce's participation in the perfect marriage event. Here is the paraphrase that Schein provides.

(50)   For some event e, ((Participates(e,s) and Participates(e,c)) & be a perfect marriage(e))

(51)   The sauce participates and the cheese participates & its a perfect marriage.

This is sufficient to illustrate the point. I take & to be a connective that connects predicates, both verbal predicates and thematic predicates. To the extent that one wants to distinguish between these predicates, I assume that there are no constraints

on & that prevent this. If one can argue that all these predicates are sentential in some way or other, then I can also follow Schein. However, it is rather unclear what exactly makes a predicate a sentential predicate (a truth value or something else?).

It may be that there are more conjuncts than Spell-Out domains, which is possible, though these conjuncts will then have to be introduced at logical form. To take one such example, if instead of 'buying(e)' we have 'buy(e) & PAST(e)', then it will not be the case that 'PAST(e)' is transferred on its own. The reason is that by assumption PAST(e) is a head, and heads do not constitute separate Spell-Out domains, as we have seen at the beginning of this chapter. If there are cases where a head introduces a separate conjunct, this cannot happen the way other conjuncts are introduced through Spell-Out. Instead it might happen through lexical rules that decompose a lexical item at logical form. My view is that these decomposition rules should not exist, as it undermines the transparency thesis.[15] My point here is simply that it is theoretically possible to invoke such rules, not that it is desirable.

4.3.4   Interpretation of arguments

In addition to conjunction, it may seem that it is necessary to have a composition operation that integrates the thematic arguments into the thematic predicates, cf. already Carlson (1984). That is, somehow 'Theme(e, _)' has to become e.g., 'Theme(e, John)'. Pietroski (2005a) essentially appeals to a type-shifting opera-

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[15]In the case just discussed, one could e.g., claim that the past morpheme is a phrase rather than a head. This makes sense since PAST(e) is shorthand for something more relational: speech time is related to other times and so on and so forth.

tion to achieve this. I will suggest a different solution, one where there is a more restrictive composition principle than type-shifting.

However, let us first look at the theory that Higginbotham (1985) outlines. Following Stowell (1981), he assumes that each word that assigns thematic roles to arguments has a *thematic grid*. This thematic grid provides information about the number and nature of these arguments. For example, the verb *see* has the following thematic grid (Higginbotham 1985: 555):

(52)   *see*, +V -N, $\langle 1,2,E \rangle$

Let us see how Higginbotham (1985: 555-556) captures the way in which arguments are interpreted based on such thematic grids. The example sentence he uses is the following.

(53)   John saw Mary.

Higginbotham assumes that the *values* of a predicate F, the things x such that $\mathbf{v}(x,F)$, are those of which it is true (Higginbotham 1985: 555). The values of (52) are the ordered triple $\langle a,b,e \rangle$, and the values are the the values of the point p of the phrase marker that has (52) as its label. If we let s range over finite sequences of things, we get the following statement for the values of p:

(54) $\mathbf{v}(s,p) \leftrightarrow (\exists x)(\exists y)(\exists e)(s = \langle x,y,e \rangle \ \& \ \text{see}(x,y,e))$

With this at hand, we can consider the argument *Mary*. *Mary* is the label of a sister point q, and we get the values of q as follows:

(55) $\mathbf{v}(x,q) \leftrightarrow x = \text{Mary}$

The value of the VP is the following, as Higginbotham assumes that the subject originates externally to the VP.

(56) $\mathbf{v}(\langle x,e \rangle,\text{VP}) \leftrightarrow (\exists \text{y}) \; \mathbf{v}(\langle x,y,e \rangle,\text{V}) \; \& \; \mathbf{v}(y,q)$

This then gives us:

(57) $\mathbf{v}(\langle x,e \rangle,\text{VP}) \leftrightarrow \text{see}(x,\text{Mary},e)$

And finally, after inserting *John*, we get a truth value:

(58) S is true $\leftrightarrow (\exists e) \; \text{see}(\text{John},\text{Mary},e)$

For Higginbotham, the assignment of thematic roles corresponds to the semantic closure of the point S in (58).

This alternative is not compatible with full thematic separation. For that reason, we need a different alternative. There are various options that come to mind. Here I will briefly consider two of them, before I present my own.

The first proposal is to assume a constrained version of Functional Application. We need a version of Functional Application that does not assume adicity changes, apart from maybe two to one for the thematic concepts. Kratzer (1996) shows us how this can be done, and the derivations would roughly look like in (59)-(64). I only show how the arguments would be integrated into the thematic predicates and provide the final logical form. A full derivation would have to provide more details, e.g., along the lines Kratzer does.

(59) $\lambda \text{y} \lambda \text{e}. \; \text{Theme}(\text{x})(\text{e})(\text{Mary})$

(60) $\lambda \text{e}. \; \text{Theme}(\text{Mary})(\text{e})$

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(61) $\lambda y \lambda e.\ \text{Agent}(x)(e)(\text{John})$

(62) $\lambda e.\ \text{Agent}(\text{John})(e)$

(63) $\lambda e.\ \text{saw}(e)$

(64) $\exists e[\text{Agent}(\text{Mary})(e)\ \&\ \text{Theme}(\text{Pat})(e)\ \&\ \text{love}(e)]$

See also Champollion (2010c) for a worked-out solution that assumes that each argument is introduced by a functional projection.

I will now present my own proposal. I suggest that there is a separate composition principle but that it is a mapping principle from syntax to logical form. I will call the relevant operation *Thematic Integration*.[16] The principle is defined as in (65).

(65) **Thematic Integration**

⌒
H   DP   →Spell-Out→   R(e, DP).

The principle takes a syntactic structure consisting of a head and a complement and provides a mapping into logical form. The principle relies on a given set of heads H and a given set of thematic predicates R:

(66) H = {Voice, F, App, …}

(67) R = {Agent, Theme, Experiencer, …}

Here I take no position on the exact nature of the sets that H and R contain. These sets are important in order to constrain the power of Thematic Integration. Furthermore, in chapter 5 I argue that Baker (1988, 1997)'s Uniformity of Theta

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[16]Bayer (1996) calls the same principle 'argument indexing'.

Assignment Hypothesis (UTAH) is very much related to this mapping principle. However, it is also possible to make use of more general labels like External and Internal, cf. Williams (1981a), if that turns out to be sufficient.

I would like to stress the necessity of something like Thematic Integration. One may think that an alternative is to put 'Agent' and 'Theme' in the Syntax and then just conjoin the sister of the argument with the argument. However, this has been argued to be implausible, as the following quote makes clear.

(68) We find it significant that no language we know of has lexical items synonymous with the (metalanguage) expressions "Theme," "Agent," "Benefactive," and so on. One can say that there was a boiling *of* the water *by* John; but "of"' and "by" do not *mean* what "Theme" and "Agent" mean. This is of interest. Languages have words for tense, force indicators, all sort of arcane quantifications and many others. Yet they do not lexically represent what seems to be a central part of their vocabulary. [. . .] We think this sort of fact reveals a simple truth. Θ-*roles are not part of the object-language* (Uriagereka and Pietroski 2002: 278).

If this is correct, it seems difficult to dispense with Thematic Integration since the latter is just a mapping relation that relates syntactic objects to a given object language. Thematic Integration is a syntactic mapping principle, and it translates syntactic arguments into thematic relations in the meta-language. This would also exclude a covert preposition that indicates some flexible proto-thematic relation of the sort that Dowty (1989) has argued for. If this preposition never shows up overtly,

it is effectively a way of encoding a semantic relation in the syntax.

4.3.5 Existential Closure

The last part that figures in the logical forms is Existential Closure. Researchers have debated whether you can insert an Existential Closure anywhere in a sentence (see e.g., Reinhart (1997)) or whether there are constraints on such insertion (see e.g., Heim (1982), Bowers (2010), and see Bayer (1996) for much discussion of existential closure in general). I will now show that we can implement a constraint on existential closure that appears to be quite compatible with Reinhart's view.

We have seen above that existential closure can happen either after all conjuncts have been conjoined, or before if there is a strong quantifier in subject position. If insertion of Existential Closure is completely free, then that predicts that it can apply to only the verb. That is, one could get a logical form of the following sort.

(69) $\exists e[\text{kick}(e)]$ & Agent(e, John) & Theme(e, balls)

The question is then how the event variables for the thematic predicates are closed. We can solve this question by letting Existential Closure apply to each spelled-out conjunct. The logical form will then end up looking like this:

(70) $\exists e[\text{kick}(e)]$ & $\exists e[\text{Agent}(e, \text{John})]$ & $\exists e[\text{Theme}(e, \text{balls})]$

Here each conjunct is existentially closed. Since the proposal in this chapter is that each conjunct corresponds to an application of Spell-Out, this is easy to implement.[17]

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[17]This way of looking at things may also have consequences for the debate concerning subsen-

Whether this view can be maintained or not depends on whether the closure of an event variable has to survive its Spell-Out domain. I do not know about any evidence that necessitates this, but the prediction is clear: Such cases should not exist if the present proposal is correct.

4.4 Some syntactic aspects of the proposal

In this section I will clarify some of the syntactic assumptions that I left unspecified when going through the derivations earlier in this chapter. This includes why Spell-Out happens the way it does and how pruning works.

The rationale behind when Spell-Out applies is that structures of the kind given in (71) are bad, namely cases where two phrases Merge. Above I gave a constraint that blocks structures like (71).

(71)

XP   YP

Uriagereka (1999) notes that structures of this sort create complications, and Moro (2000) develops this at great length (see already Speas (1990: 48)). Moro argues that such structures are unstable in narrow syntax and that one of the XPs needs to move in order to create a structure that is licit for purposes of linearization: '...movement can be thought of as a way to rescue the structure at PF in case a point of symmetry has been generated [...] To put it more generally, movement turns out to be a consequence of the necessity of organizing words into a linear order' (Moro 2000: 3). Recently Chomsky (2008, 2010) has made a similar argument and Alexiadou and

tentialism, cf. Merchant (2001, 2004), Stainton (2006).

Anagnostopoulou (2001, 2007), Richards (2010b) have also argued that structures akin to (71) are problematic in various ways.[18] In particular, Chomsky (2010) suggests that the need for movement is related to labeling and that structures like (71) cannot be properly labeled.[19]

Notice that all of these proposals treat the badness of (71) as a representational problem that somehow can be remedied. Moro assumes that it can be fixed by moving one of the XPs and that somehow the original trace/copy does not create

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[18]For example, Richards (2010b: 14-15) argues that the data in (i) follow from a distinctness condition where two phrases cannot be close to each other within Richards' definition of a phase.

(i)   *Into the room kicked John the ball.

The problem with his analysis is that data such as (i) are fine in V2 languages like Norwegian. However, nothing in the relevant part of the syntax is different, on any account that I know of, between English and Norwegian. And according to Richards, the problem lies in the base structure, as *a man* and *a ball* will be in the same domain and thus the two phrases will cause a linearization crash. Unless a blunt stipulation is made, I do not see how Richards' analysis can deal with the contrast between English and Norwegian.

[19]Moro (2008) elaborates on this, following Chomsky (2008)'s suggestion that labels are derived computationally through inspecting the search space of a head. Moro argues that two phrases cannot be merged because the configuration would crash. The reason for this crash is that the search space for any head H that merges with the two phrases will be ambiguous. Moro (2008: 2) presents the following solution: 'On the other hand, if either XP or YP is targeted by H and then raised (yielding, for example: {YP, {H, {XP, ~~YP~~}}}), the derivation can proceed, because the computational mechanism has overcome the problem of labelling: YP is no longer available for introspection to H [. . .] and the label can be properly assigned'. As Sigurðsson (To appear) notes, a problem with this solution is that it is countercyclic: It requires you to go back in the derivation in order to assign the label.

problems. It is very unclear how this at all can be implemented from the point of view of the copy theory of movement. All occurrences of a copy are identical, so how can one occurrence not matter for the purposes of a constraint? Chomsky's proposal, as far as I can tell, suffers from a similar problem. Even if a structure can be correctly labeled after movement, why does not the new structure, the site of the remerge, create the same violation that the movement was supposed to fix? See Chomsky (In press) for some discussion of a novel view on intervention that is claimed to bypass this problem.

For these reasons, I am instead proposing that the constraint that bans (71) has to be derivational and that it is a universal ban. Structures that look like (71) simply cannot be generated through Set Merge. The Spell-Out system I have developed above effectively bans a merger of the kind in (71), which is related to what Uriagereka (1999) and Narita (2009, 2011) argue for subjects and adjuncts. The reason is that you can never put two syntactic objects that can only be phrases together: In those cases, one of the phrases needs to be reduced to a bare head. So whenever you have a structure like (71), Spell-Out needs to apply to the complement of the head that is on the clausal spine.[20] At this point, there is a difference between both Uriagereka (1999) and Narita (2009, 2011). The former argues that specifiers (and adjuncts) can be spelled out separately, whereas the latter argues that there

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[20] In order to make sure that this happens, you can define Spell-Out in terms of the main workspace, assuming that there is a main workspace for the clausal spine and that phrases that want to merge with the main workspace are constructed in a separate workspace, cf. Uriagereka (1999).

is optionality as to whether Spell-Out applies to specifiers or complements. In the present system, there is no optionality: Spell-Out always has to target the complement of the head that constitutes the spine of the relevant tree that is being built.

A similar logic has been employed by Epstein (2009). He refers to Epstein (2007) who noted a problem with the resulting structure after a phase-head complement has been spelled out. The problem is that we are left with a non-term. If narrow syntax only operates on terms, this is a problem, since the resulting structure after, say, spelling out the complement of v, is the following, according to Epstein:

(72)
$$
\begin{array}{c}
\text{vP} \\
\diagup\diagdown \\
\text{external argument} \quad \text{v'} \\
| \\
\text{v}
\end{array}
$$

This structure clearly shows that the object after Spell-Out retains the bar level, which does not appear to be necessary. Epstein (2009) therefore argues that the phase edge is transformed into a head-complement relation. He notes that this gives us an additional consequence: all theta marking configurations can be reduced to head-complement relations, instead of head-complement and the configuration in (72). In chapter 5, I will endorse this conclusion, though in a slightly different way.

If Epstein is right, we have a reason for why the constraint in (71) should hold: It provides a unified relation for assignment of thematic roles, but in a different way than previous proposals. A further motivation behind the constraint is that

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if we adopt the derivational version of the constraint, we are able to eliminate the difference between complements and specifiers. As I have tried to show above, that has a major consequence, namely it gives a transparent mapping from the syntax onto Neo-Davidsonian logical forms. Previous research has not been able to do that with the same empirical adequacy, viz. accounting for the data in chapter 3. Needless to say, this payoff does not *explain* the constraint, but it does provide motivation for the constraint.

Note that complement reduction is entirely in line with Chomsky's approach to phases, though my approach requires a more flexible and different definition of what a phase is, if a phase is the relevant notion. In what follows, I will not talk about phases, but rather stick to Spell-Out. If my suggestions concerning Spell-Out are on the right track, then we may want to revise what a phase is. Clearly, the concept will be more variable and relational (cf. den Dikken (2006, 2007), Gallego (2010)) than on Chomsky's approach. I leave this issue for future work.

Before moving on, it will be useful to make some of the technical aspects clearer. If one assumes that a Maximal Projection is a projection that is not dominated by anything, it seems like the very first Merge will consist of two phrases being merged. The lexical items are taken from the numeration, and at that point neither is dominated by anything. Thus they are maximal projections on such a definition. How can one claim that two maximal projections cannot be merged? That seems to effectively ban any derivation from getting off the ground.

A way to resolve the problem is to argue that the problem is only apparent. Chomsky (1995c: 245) argues that 'we understand a *terminal element* LI to be an

item selected from the numeration, with no parts (other than features) relevant to C_{HL}. A category X^{min} is a terminal element, with no categorial parts. We restrict the term *head* to terminal elements'. Chomsky provides the following definitions:

(73) MAXIMAL PROJECTION:

A maximal projection is a syntactic object that does not project any further.

(74) MINIMAL PROJECTION:

A minimal projection is a lexical item selected from the numeration.

This means '[...] that an item can be both an X^0 and an XP' (Chomsky 1995c: 249). Chomsky mentions clitics as examples of the latter. Given this, there is in fact no problem related to claiming that two phrases cannot be merged. First Merge can either be between two heads or a head and a phrase. Given that each element has an ambiguous structure, a constraint banning the merger of two phrases can be taken to be a constraint on Merge such that this result will never be generated. That is, X-XP and X-Y structures are generated, but if there is a derivational constraint preventing the generation of XP-XP, such a structure won't be created.

Thus it is possible to implement the ban on merging two phrases without running into a paradox such that no derivation can ever get started.

Another issue concerns what happens when a tree structure is pruned, cf. the discussion of Epstein's work above. There are two alternatives, as far as I can tell. Let us first look at it from a graph theoretic perspective, using set-theory. Consider the abstract structure in (75) and its set-theoretic representation in (76).

(75)   XP
                                       /\
                                      X   YP

(76)   {X, {X, Y}}

The next step is to merge a ZP. Since this cannot be done due to the constraint in
(71), the complement of X undergoes Spell-Out. After Spell-Out, we are just left
with (77).

(77)   {X, {X}}

However, there is no need for X to project when there is no complement. Let us
state this more explicitly, building on Epstein (2009)'s insights.

(78)   **Non-redundancy condition on pruning (NCOP):**

       Remove the label when there is no reason to project the label.

When there is a complement, there will always be a reason to project the label. This
of course assumes that we need labels, see Collins (2002), Seely (2006), Hornstein
(2009) for discussion and different views. Assuming labels and the NCOP, (77) is
therefore equivalent to (79).

(79)   X

ZP can now Merge with X, and we get the structure in (80) and its set-theoretical
equivalent in (81).

(80)   XP
                                       /\
                                      X   ZP

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(81) {XP, {X, ZP}}

The set-theoretic notion shows more clearly what happens when a structure is pruned. However, we need to make a stipulation concerning the behavior of labels in order to get the result we want.

The other alternative is a purely set-theoretic perspective. One can then argue that what pruning does is eliminate one of the sets in (76). That is, pruning reduces (82) to (83) by deleting the entire set {X, Y} and only retaining the label. The label then becomes a term, assuming that labels are copies of terms.

(82) {X, {X, Y}}

(83) X

This would mean that it's not just Y that gets spelled out, but an occurrence of X as well. What remains after Spell-Out is just X, and this is a bare head that can merge with the phrase ZP. In this case, there is no need for a non-redundancy condition on pruning.

I am not going to choose between these two alternatives here, but I want to point out that it makes a difference whether one considers pruning from a graph-theoretic or a set-theoretic perspective (see Kupin (1978) for an earlier and somewhat similar argument).

4.5 Conclusions

This chapter argues that it is possible to provide a syntax where each Spell-Out domain corresponds to a conjunct at logical form. By assuming that two maximal

projections can never Merge, and that one of them has to be reduced to a bare head via Spell-Out, the dynamics of Spell-Out will be exactly as required for each transfer to the interfaces to correspond to a conjunct. Furthermore I have discussed the basic semantic principles that ensure that the logical forms are construed correctly. I have also provided detailed examples of how the derivations work, and elaborated on the details of the syntactic theory. In particular I have discussed why there should be a constraint barring two maximal projections from being merged, and how Spell-Out prunes the syntactic representation.

Towards the end of the chapter I explored a few syntactic consequences of the present proposal, and in the next chapter I will continue to consider several other syntactic consequences.

Chapter 5

The EPP, Movement, and Serial Verbs

5.1   Introduction

In the previous chapter, I developed a new theory of Spell-Out and I addressed a few consequences that this theory has. The goal of the present chapter is to continue to address consequences of the proposal. I will particularly focus on the EPP as that continues to be a very important issue in the theory of syntax. It may also seem even more important for a theory that claims that there is no distinction between specifiers and complements. In this chapter, I will argue that there is a way to recast the EPP in the theory I have been arguing for in this dissertation.

This chapter is organized as follows. Section 5.2 discusses linearization in English and section 5.3 suggests how the present theory can be extended to account for the EPP in English. The chapter proceeds to discuss movement in section 5.4 and how movement can happen when the domains of Spell-Out are as outlined in chapter 4. Section 5.5 deals with Condition on Extraction Domains facts and briefly considers agreement as well. Serial verbs are the topic of section 5.6, and in the last section I discuss the nature of UTAH within the present theory.

5.2 Linearizing elements in English

The attentive reader will notice an implication of the present system that on the face of it is rather unfortunate. If if head-complement relations are the locus of linearization, and specifiers are defined the same way as complements, then the current system predicts that English should be a VSO language. Let us see why this is the case. I assume that the verb moves from V^0 through F^0 and then to Voice^0, following Larson (1988, Forthcoming) and Chomsky (1995c), among others. Let us look at a concrete example, namely the sentence in (1).

(1)   John saw Mary.

For each Spell-Out domain, we then have the following relations:

(2)   VP
                                      |
                                     see

(3)   FP
                                     /\
                                 Mary   see

(4)   VoiceP
                                     /\
                                 John   see

I assume that Merge creates an unordered set, so these structures represent unordered sets. If we have a linearization algorithm where each unordered set is mapped onto an ordered set with a specified linear order (Epstein et al. 1998,

Richards 2004, Lohndal and Samuels 2010), then we get the following linear statements:[1]

(5)   see

(6)   see > Mary

(7)   see > John

If we only pronounce the highest copy, and if we assume that *John* precedes *Mary* by virtue of being hierarchically higher, then we get the linear order *see John Mary*, that is, VSO. Although McCawley (1970) argues that English underlyingly is VSO because that simplifies the number of cycles one needs and because it is also in line with how the Polish notation of predicate logic conceives of the relationship between the predicate and its arguments, these reasons are no longer valid: I have explicitly argued that verbs do not have arguments, in which case the second argument McCawley makes evaporates. Similarly, our theories of the cycle are quite different today as the overall architecture of the grammar has changed rather a lot (see Freidin (1999), Lasnik (2006) and Freidin and Lasnik (2011) for useful discussion). On my approach, the underlying order only consists of unordered sets, but with the linearization statements English needs, without further assumptions, English comes out as VSO.

Kayne (1994) argues that there is no difference between adjuncts and specifiers. Inspired by this claim, I will argue that movement is adjunction and that adjunction

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[1]Here I assume that when there is just one lexical item, the algorithm just returns that item. An alternative is to say that there is no linearization statement for such cases.

amounts to Pair Merge, following Chomsky (2004).[2] Since Pair Merge involves an ordered set, as opposed to an unordered set (regular Merge), we can impose that the ordered set corresponds to a linear left to right ordering. If the subject moves and adjoins to T, a statement specific to English will state that the subject precedes the head it has been adjoined to, thus ensuring that the subject precedes the finite verb in English. Essentially this proposal amounts to saying that the subject moves because there is a requirement in English that the subject position be filled. This requirement is the EPP. [3]

The relevant part of the structure for a sentence like (8) will look as in (9).

(8) John eats a cake.

(9)   TP

                        <John   T>

Here the <> indicates an ordered set, i.e., <John, T>, which is the result of Pair Merge of *John* to T. I assume that each adjunct needs to be ordered in a specific way (stated at the PF interface), cf. the fact that many adjuncts follow what

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[2]The claim that adjuncts are on a different 'plane' was in a way anticipated by Koizumi (1995: 144, fn. 4): '[...] either adjuncts may be introduced into a phrase marker non-cyclically or they are projected on a different plane of a three dimensional phrase structure so that they are invisible for the purpose of locality conditions'. See also Åfarli (1995) and Rubin (2003) for critical discussion.

[3]Various researchers have argued that the EPP follows from language-specific conditions on linear order, cf. Bever (2009), Kučerovà (2009), Sigurðsson (2010). This was already suggested by Chomsky to Fukui, namely that 'there is a rule of PF which fronts the subject to the specifier of IP position [...]' (Fukui 1986: 61).

they modify. These ordering statements are language-specific and belong to the PF interface. For the T head in English, the adjunct precedes the head.

The present approach predicts that there should be VSO languages where all arguments stay in situ. McCloskey (1997) and Roberts (2005) discuss Irish and Welsh and conclude that in these languages, the subject does not stay in situ. However, according to Alexiadou and Anagnostopoulou (2001), in languages like Greek, Romanian and Spanish, the arguments stay in situ. Alexiadou and Anagnostopoulou (2001: 224) provide the examples in (10)-(12) for Spanish, Romanian and Greek, respectively.

(10) Leyo ayer   [$_{VP}$ Juan el libro].
      read yesterday   Juan the book
      'Juan read the book yesterday.'

(11) L-a   scris   [$_{VP}$ Ion o scrisoare Mariei].
      CL-has written   Ion a letter   to.Mariei
      'Ion has written a letter to Mariei.'

(12) Elise   sosta   [$_{VP}$ o   Petros tin askisi].
      solved correctly   the Petros the problem
      'Petros solved the problem correctly.'

As they point out, these languages are V-to-I-raising languages (see their paper for references). They argue that these subjects are VP-internal by looking at participle and adverb placement facts in periphrastic constructions (see also Alexiadou (1997) and Alexiadou and Anagnostopoulou (1998)). A relevant example is provided in (13) (Alexiadou and Anagnostopoulou 2001: 225).

(13) An ehi idi   diavasi prosektika [o   Janis to vivlio] . . .
      if has already read   carefully   the Janis the book
      'If Janis has already read the book carefully . . . '

These data are exactly as predicted on my approach. They fall out automatically if these languages have the head-complement setting with verb movement: the verb moves above the object and the subject, yielding the VSO order I illustrated above. It is worth noting that this is the case for any account where the subject starts out low and the verb moves to a higher functional head.

As for SOV languages like Japanese, more needs to be said. Since they have the complement-head setting, the language will come out as SVO if the highest verb is pronounced. This means that either the lowest copy of the verb is pronounced or the object moves (see Kayne (1994) for the latter). I will not perform a detailed study of OV-languages here, but these are the two options that the present approach gives, and the movement of the object alternative is certainly in line with a common analysis in the literature.

The next section discusses the EPP in great detail, and I propose a slight modification of Chomsky and Lasnik's proposal that the EPP is the requirement that a functional head need a specifier. Specifically I argue that the EPP should be stated as a requirement that a functional head has a nominal sister. This order can be fulfilled either by moving an element lower down in the tree structure, or by inserting an expletive as a last resort. First, I will start by reviewing some background on the EPP, and then go on to discuss how my theory can account for the EPP.

5.3 The nature of the EPP

There has been a lot of discussion in the literature of the EPP. In fact, prior to Chomsky inventing the name, Perlmutter (1971: 100) noted that 'Any sentence other than an imperative in which there is an S that does not contain a subject in surface structure is ungrammatical'. Chomsky (1981)'s discussion focuses on examples such as (14)-(15).

(14)   It seems that John is here.

(15)   *Seems that John is here.

It is important that there is an expletive subject here that cannot bear a semantic relationship to the verb, since lack of such a semantic relationship could account for the contrast between (16) and (17).

(16)   Mary baked a cake.

(17)   *Baked a cake.

The object cannot move from one Case position to another, which is presumably what excludes (17).

Originally, the EPP was called Principle P by Chomsky (1981) and it said that the principle 'is the structural requirement that certain configurations ...must have subjects ...' (Chomsky 1981: 27). Chomsky particularly focused on English and noted that the subject is obligatory. The name EPP, though, comes from Chomsky (1982). Recall that the Projection Principle 'states informally that the θ-marking properties or each lexical item must be represented categorically at each syntactic

level (Chomsky 1982: 8). The Extended Projection Principle goes beyond that, as Chomsky notes in this lengthy quote:

(18) It might be thought that [the fact that clauses require subjects] follows from the Projection Principle, ...but this is not quite correct. While subcategorized complements are obligatory for heads, the θ-marked subject is not, as we can see from passives or nominals ...Furthermore, nonarguments can occupy the subject position, as in *it is clear that S, I expect [it to be clear that S]*; in fact, the subject position *must* be filled by a pleonastic element in structures lacking a θ-marked subject. It seems, then, that the requirement that the clause have a subject is independent of the Projection Principle ...I will henceforth refer to the Projection Principle along with the requirement that clauses have subjects as the *Extended Projection Principle* (Chomsky 1982: 9-10).

However, the terminological convention ever since has been that the EPP only denotes the 'extended' part of the EPP. Despite this, there are at least three versions of the EPP, corresponding to how the theory has developed (cf. Roberts (2005: 5)). The first version was that all clauses need to have a subject position, as we have just seen. The second version, in Chomsky (1995c), is that a DP has a strong feature that is checked in a specific position, namely the canonical, obligatorily filled subject position of English. Lastly, Chomsky (2000a, 2001) argues that the EPP should be conceived of as a parametrized requirement that a functional head has a specifier.[4]

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[4]See also Lasnik (2003) and Cable (2010) who argue that EPP is optional.

Below I will discuss this issue and conclude, following much work by Howard Lasnik, that the third formulation is the correct one. Most of the discussion will center on English since English seems to be the language that most clearly provides evidence for something like the EPP.

Before moving on, it is worth to pause to note an unclarity regarding the EPP, first noted by McCloskey (1997: 242).

(19) With the advent of the Internal Subject Hypothesis, it becomes crucially unclear what position this principle [the EPP] referred to. Is it properly construed so as to require that the internal subject position always be structurally realized? Or is the requirement that there be a structural subject to be construed rather as a property of functional projections, as suggested in Chomsky (1993)? If there are many inflectional projections between C and V, which one of them, if any, is privileged by the Extended Projection Principle?

I will not have more to say about this issue here, but with the advent of the cartographic approach (Pollock 1989, Rizzi 1997, Cinque 1999), with a series of projections in the TP area, this problem is very acute, to say the least. But at least for English, the problem is how to ensure that what is traditionally known as SpecTP is filled.

In section 5.2, I suggested that subjects move to the subject position in English because otherwise my theory would yield the wrong linear order (effectively VSO). The question is why there is this movement. The EPP would provide an answer,

though there are many proposals in the literature that reduce the EPP to Case and other independently motivated principles (cf. Williams (1980), Rothstein (1983), Fukui and Speas (1986), Heycock (1991), McCloskey (1997), Castillo et al. (1999, 2009), Martin (1999), Boeckx (2000), Alexiadou and Anagnostopoulou (2001, 2007), Bošković (2002), Epstein and Seely (2006), Landau (2007), Bever (2009), Kučerovà (2009), Richards (2010a), Sigurðsson (2010)). I think important data discussed by Lasnik (2001a,b, 2003) (see also Nevins (2004) for relevant discussion) show that it is very difficult to reduce the EPP entirely. Therefore I will assume an EPP constraint, and I will show that this constraint can actually be stated as the requirement that a functional head require a nominal sister. Let us briefly consider somewhat abstractly what this means.

For me, a specifier is the sister of a head; see chapter 4 for discussion. Lasnik (2003: 20) defines the EPP as 'the requirement that certain functional heads have a specifier'. Since I define specifiers the way I do, I can reformulate this requirement as the requirement that certain functional heads need a sister. Lasnik does not say that this specifier has to be nominal-like, but it appears to be implicit.[5] The latter is important, because otherwise one might think that it suffices to merge T and VoiceP as in (20).

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[5]I say nominal-like, because it is not entirely clear how expletives like *there* should be analyzed.

(20)   TP
                                    ╱‾‾‾╲
                               T   VoiceP
                                        ╱‾‾‾╲
                                   Voice   …

However VoiceP is clearly not nominal, but rather verbal. Instead, VoiceP needs to

be spelled out so that a nominal can merge with T (cf. chapter 4). That gives the

following structure:

(21)   TP
                                    ╱‾‾╲
                                 DP   T
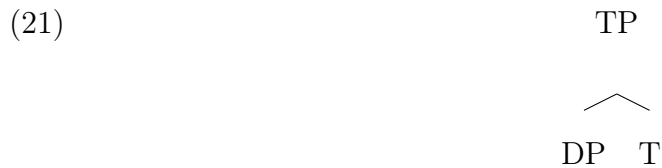
The configuration in (21) is what actually fulfills the EPP requirement that the

functional head T needs a nominal specifier. Thus I slightly modify the theory in

Chomsky (2000a, 2001) and especially the one in Lasnik's work. In the rest of this

section, I will illustrate this, and as I do that, also present Lasnik's motivation for

why we still need an EPP requirement.

Section 5.3.1 discusses Lasnik's arguments for the need for an EPP princi-

ple. Section 5.3.2 extends the account I'm advocating to expletives and pro-drop

languages.

5.3.1   Lasnik's arguments for the EPP

Lasnik (2003) gives a comprehensive discussion of the EPP and why some previous

attempts to reduce the EPP to other independently motivated mechanisms do not

work. Fukui and Speas (1986) already suggest that EPP effects follow from a requirement that a Case assigner must assign Case; see also Bošković (2002), Epstein and Seely (2006) and Hornstein (2009). This extends to Exceptional Case Marking (ECM) configurations too, Fukui and Speas argue, and derives the contrast between (22) and (23), since the verb *believe* assigns accusative Case.

(22)   Mary believes [it to seem that John is here].

(23)   *Mary believes [to seem that John is here].

Lasnik argues, however, that there are examples where neither θ-theory nor Case theory demands a subject, but still a subject seems to be required. He gives the following examples that are based on discussion in Bošković (1997) of BELIEVE verbs, that is, verbs that assign a subject theta role, do not check accusative Case and take an infinitival complement.

(24)   *the belief [to seem [Peter is ill]]

(25)   *John has conjectured [to seem [Peter is ill]]

Since nouns need not have a Case feature, a subject in the infinitival clause does not seem to be required in (24). This is confirmed by the data in (26).

(26)   *the belief [it to seem [Peter is ill]]

Lasnik argues that (26) violates the Case Filter, which means that Case is not licensed in the subject position of the infinitival clause. Therefore, the only obvious explanation for (24) has to rely on the EPP. Lasnik argues that one could perhaps argue that *belief* cannot take an infinitival complement of the non-control type. This

is descriptively true, Lasnik (2003: 4) says, but he argues that 'in the absence of a better account of the fact, it seems most principled to rely on the combination of the Case Filter and the EPP'.[6]

As for (25), the explanation he gives is the same. The presence of a pleonastic subject does not improve the sentence and indicates that *conjecture* does not have a Case feature that it can discharge. This is shown in (27).

(27)   *John has conjectured [it to seem [Peter is ill]]

However, it is not clear that these are the only accounts, as Lasnik concedes. Epstein and Seely (2006) offer a different view for both *belief* and *conjecture* cases. For *belief*, they essentially take over Martin (1999)'s analysis, which in turn invokes Myer's generalization. The latter can be stated as follows:

(28)   '...if zero derivation is a kind of inflection, we predict that no zero-derived word could appear inside a derivational suffix, i.e. no such suffix could be added to a zero-derived word (Myers 1984: 62).

---

[6]Epstein and Seely (2006: 102-103) challenge the descriptive generalization by presenting the following data.

(i)   My preference for it to be likely that my horse will win is clear.

(ii)   My desire for it to be obvious that he is smart pleased them.

If the *for*-phrase is a complement, the examples violate the descriptive generalization that nouns never take non-finite complements of the non-control type. However, in these cases we are plausibly dealing with CPs rather than TPs, and the C head may check the case of *it*. But then even the stipulation would not suffice.

The analysis Martin gives runs as follows: a nominal like *belief* is derived from its verbal root, and this root takes a full CP complement with a null complementizer. This complementizer is an affix (Pesetsky 1991), and this affix incorporates into the verb *believe.* The [*believe* + null affix C] is the input to the nominalizing operation, but due to Myer's generalization, the zero-derived element cannot host a derivational suffix. Assuming that Myer's generalization holds, this story accounts for the data, though it leaves unexplained *why* Myer's generalization should hold.

For *conjecture*, Epstein and Seely build on Ormazabal (1995) (see also Pesetsky (1991), Martin (1999), Bošković and Lasnik (2003)). Ormazabal argues that ECM infinitival complements have a CP with a null complementizer (see also Kayne (1984) and Pesetsky (1991)). This null complementizer is subject to Lasnik (1981)'s Stray Affix Filter, which means that the null complementizer needs to attach to a host. On the assumption that *conjecture* is a noun, (27) is accounted for by saying that the null complementizer cannot find an appropriate verbal host. Epstein et al. (2005), Epstein and Seely (2006) explicitly make this claim in relation to the present data.

Lasnik (2003) presents several arguments in favor of the EPP, most of which rely on movement through infinitival clauses. Since several of them are similar in character, I will only discuss a few of them here. The reason for this is also that the discussion will apply equally to the other examples Lasnik discusses.

Lasnik and Saito (1991), based on Postal (1974), present arguments that there is overt raising in ECM infinitives. Specifically, they argue that the ECM subject has raised overtly to SpecAgr$_O$. The following tree structure illustrates this (taken from Lasnik (2003: 7)).

(29)

```
                        Agr_SP
                       /      \
                    she        Agr_S'
                              /      \
                          Agr_S       TP
                                    /    \
                                 will     VP
                                        /    \
                                   t_she      V'
                                            /    \
                                        prove     Agr_OP
                                                 /      \
                                              Bob        Agr_O'
                                                        /      \
                                                  t_prove       VP
                                                                |
                                                                V'
                                                              /    \
                                                             V      Agr_SP
                                                                   /     \
                                                               t_Bob    to be guilty
```
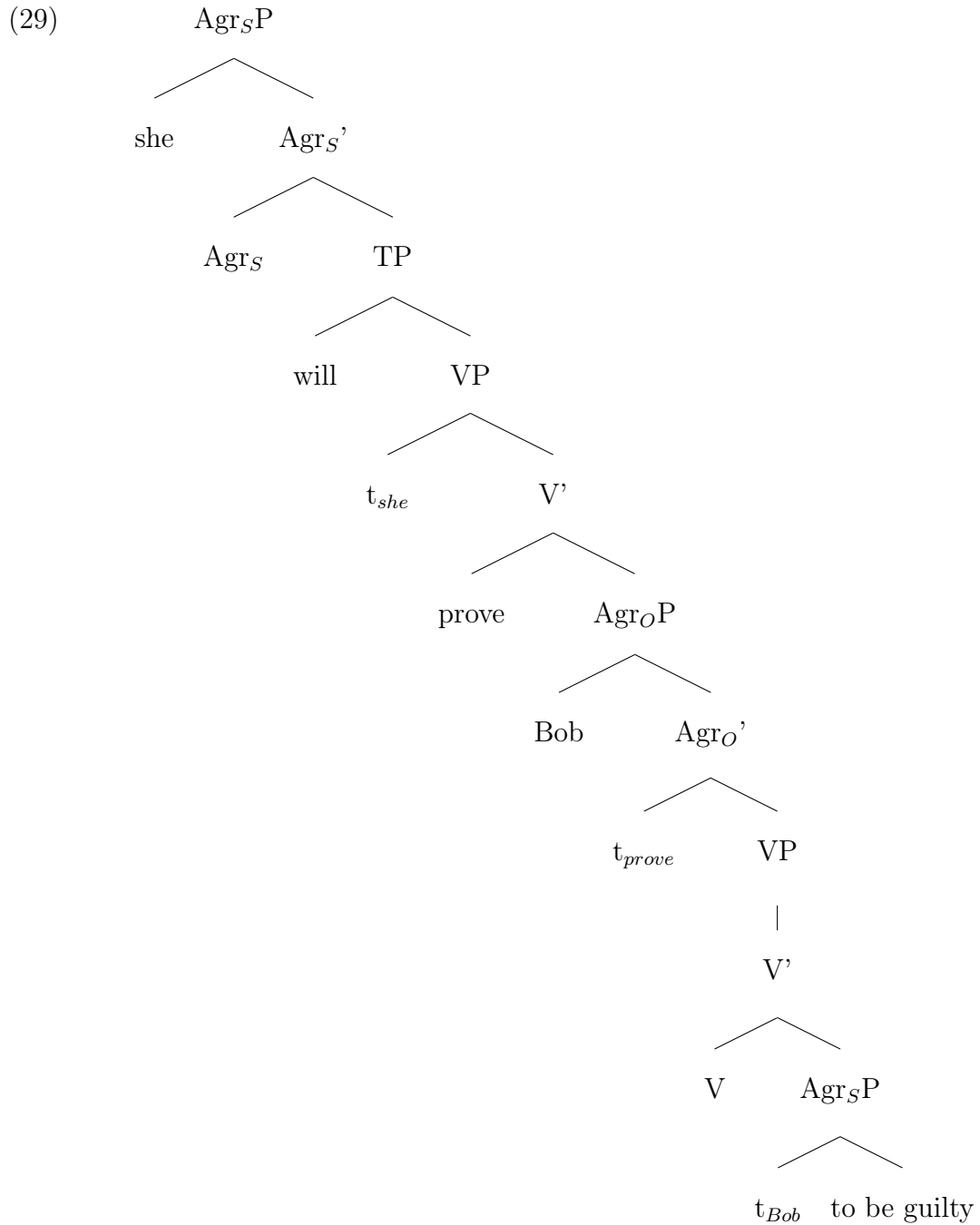
Lasnik and Saito provide a variety of evidence in favor of raising of the ECM subject. In particular, they focus on the contrast between infinitival and finite complements, as illustrated in the examples in (30)-(32) (Lasnik 2003: 7-8).

(30)   a.   The DA proved [two men to have been at the scene of the crime] during

each other's trials.

    b. ?*The DA proved [that two men were at the scene of the crime] during

each other's trials.

(31)   a. The DA proved [no suspect$_i$ to have been at the scene of the crime]

during his$_i$ trial.

    b. ?*The DA proved [that no suspect$_i$ was at the scene of the crime] during

his$_i$ trial.

(32)   a. The DA proved [noone to have been at the scene] during any of the

trials.

    b. ?*The DA proved [that noone was quilty] during any of the trials.

One might think that this does not provide an argument for the EPP, since the ECM

subjects are in SpecAgr$_O$P and not in SpecTP. However, there are many other cases

where ECM subjects stay in situ, so the cases that show further raising are after all

illustrative. Let us consider a further argument to this effect.

      Based on work by Kayne (1985) and Johnson (1991), Lasnik (2003: 8) discusses

examples like (33)-(34).[7]

(33)   Mary made John out to be a fool.

(34)   Mary made out John to be a fool.

Lasnik argues that in (33), *John* has overtly raised into the matrix clause (to the

specifier of Agr$_O$). In (34), which shows that the raising is optional for many speak-

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[7]It should be pointed out that not all speakers think that (34) is good, and the following

argument is based on those who do.

ers, *John* stays in the embedded sentence. We can assume Lasnik's analysis of these cases, by positing EPP features on the relevant functional heads. In (34), *John* has moved to become a sister of the embedded T, and in (33), it has raised to become the sister of Agr$_O$.

Now, these two A-positions potentially allow scopal ambiguities. Chomsky (1995c), following an observation by Zubizarreta (1982), discusses the interplay of quantifiers and negation based on the following data:

(35) (it seems that) everyone isn't there yet

(36) Everyone seems [*t* not to be there yet]

According to Chomsky, negation can have wide scope over the quantifier in the first sentence but not in the second. He argues that '[...] reconstruction in the A-chain does not take place, so it appears' (Chomsky 1995c: 327). Lasnik (2003: 9) phrases the generalization as follows: '[...] a universal quantifier in subject position of a clause can be interpreted inside the scope of clausal negation in that clause, but cannot be 'reconstructed' to that position if it has A-moved away'.

As we would predict, if we consider ECM complements where it is clear that the subject has moved, scopal reconstruction is not possible. Lasnik (2003: 10) provides the example in (37).

(37) The mathematician made every even number out not to be the sum of two primes.

In this case, the only reading is one which is pragmatically very implausible: the mathematician was engaged in the futile activity of convincing someone that no

even number is the sum of two primes. The more plausible reading would have been a case where the mathematician was trying to convince someone that Goldbach's conjecture is false. So even pragmatic pressure does not make the reading available, which is consistent with Chomsky's claim. If we change the word order, narrow scope is available:

(38)   The mathematician made out every even number not to be the sum of two primes.

Here the subject must be in the lower clause, which entails that it can be interpreted in the scope of negation. Thus we have a very strong argument for the EPP, since the surface position and the interpretive position diverge. As Lasnik points out, if Chomsky is correct, it cannot be the case that *every even number* has raised, followed by *out* raising even higher. Rather, *every even number* has to be the specifier of the embedded T.

Another argument for the EPP comes from binding theory. Consider the example in (39) (Lasnik 2003: 12).

(39)   John appears to Mary [to seem to himself/*herself [to be the best candidate]]

Lasnik argues that absent the EPP, there would be no reason for *John* to move through SpecTP of the intermediate TP.[8] If such movement does not take place, *himself* should not be a licit anaphor, and by fairly standard assumptions, *herself*

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[8]Epstein and Seely (2006) argue adamantly that successive A-movement does not really exist. If they are right, Lasnik's data need to receive a different analysis.

should be possible. Again, Lasnik's analysis works: The intermediate T has an EPP requirement which triggers movement, which will ensure that *John* will move across *himself* on its way to its final landing site. A partial derivation for (39) would look as follows, where A and B are functional heads.[9]

(40) [$_{FP}$ F be] (Spell out *be*, merge *the best candidate*)

(41) [$_{FP}$ F the best candidate] (Merge T, Spell out FP, merge *John*)

(42) [$_{TP}$ T [$_{VoiceP}$ John Voice]] (Copy *John*, spell out VoiceP, merge with T)

(43) [$_{TP}$ John T] (Merge A)

(44) [$_{AP}$ A [$_{TP}$ John T]] (Copy *John*, merge *to himself*, spell out TP)

(45) [$_{AP}$ to himself A] (Merge B)

(46) [$_{BP}$ B [$_{AP}$ to himself A]] (Merge *seems*, spell out AP)

(47) [$_{BP}$ seems B] (Merge Voice)

(48) [$_{VoiceP}$ Voice [$_{BP}$ seems B]] (Spell out BP, merge *John*)

(49) [$_{VoiceP}$ Voice John]

The derivation shows the applications of Spell-Out and how *John* moves though the second infinitival clause (more on how movement works in section 5.4). The parentheses indicate the next operation that is going to happen. An element that is being moved has to be copied and put in a separate workspace (see section 5.4 for discussion). Then the complement of a head can be spelled out and the moved

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[9]The verb *seems* is introduced by functional structure, which corresponds to the categorizer of the root. See section 5.6 for further discussion.

element can remerge with that head. This is what is meant by 'copy John, spell out VoiceP, merge with T' above.

The reader will notice that *John* and *himself* are not in the same Spell-Out domain during the derivation. There are two ways to address this apparent problem. One is to adopt the Agree theory of binding, where features of reflexive agrees with a functional head that then agrees with its antecedent (Reuland 2001, 2011). On this view, *himself* agrees with F, which is to say that the phi-features of the reflexive are transmitted to F. The next step is that F agrees in phi-features with Voice. Voice introduces the Agent, and at that point, Voice can agree with *John*. If the phi-features of the reflexive match, then we have a licit antecedent-reflexive relationship. So *himself* works, whereas *herself* would not work. Furthermore, *John* will be the only licit antecedent since it matches the features of the reflexive and it is merged before *Mary*.

Another view is that binding essentially is movement (Hornstein 2007). On this view, the antecedent starts out in a constituent together with SELF, and then the antecedent moves to its final landing site. In order to make this work for (39), one would have to allow *John* to undergo sideward movement (Nunes 2004) so that it can merge with SELF. This is because *John* starts out below *himself*. In order to become a licit antecedent, *John* needs to merge with SELF at some point during the derivation. Sideward movement would provide the adequate relationship.

Both theories would be adequate for present purposes, so I leave it to the reader to choose between them.

A similar example concerns Condition B of the binding theory. Lasnik (2003: 13) gives the example in (50).

(50) *John$_i$ is believed [to seem to him$_i$ [to be a genius]]

Here the obviation appears due to movement through the intermediate SpecTP, assuming that the binding domain is the infinitival sentence. My account of this example would be entirely parallel to the account I just gave of (39).

A caveat is in order before moving on. Drummond and Hornstein (2011) argue that these data do not tell us much. They argue that the main problem with examples such as (39) and (50) concerns the status of (51).

(51) John appears to Mary$_k$ to seem to her$_k$ to be intelligent.

Drummond and Hornstein argue that the example in (51) should be perfect given the unacceptability of (50) - pronouns should be licit where reflexives are banned. But they claim that the example 'is not particularly good' and that this makes it hard to interpret the data in (39) and (50).[10] That may be true, but we would also want to test (51) and make sure that this sentence is not bad for, say, pragmatic reasons. The following sentence is also just as curious as (51).

(52) It appears to Mary$_k$ to seem to her$_k$ that John is intelligent.

However, there does not seem to be much of a pragmatic difference between these examples. If that is the case, then Drummond and Hornstein's claim stands.

The last argument I will discuss involves ellipsis and repair configurations. Lasnik (2001a) argues against Chomsky (1995c)'s clam that the EPP reduces to a

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[10]The example is fine though without the coreference.

strong feature of a functional head. Instead Lasnik argues that the EPP is not a matter of feature checking, which is similar to the claim in Chomsky (1982, 2000a). In order to consider the argument, it is necessary to provide some background discussion. Lasnik considers pseudogapping as illustrated in (53).

(53) You might not believe me but you will Bob.

He follows Lasnik (1995) in arguing that pseudogapping is derived by overt 'object shift' (to SpecAgr$_O$P, following Koizumi (1995)) followed by deletion of the residual VP. The main verb has not raised, and the question is why such raising otherwise needs to take place, as the following contrast shows.

(54) *You will Bob believe.

(55) You will believe Bob.

Lasnik argues that one needs to postulate a strong feature that forces the raising of V in these non-elliptical cases. Based on Ochi (1999), who argues that it is just the matching feature of an item that is attracted, the lower V becomes phonologically defective after attraction of the lower 'V'. A crash at PF can be avoided if the entire V is raised (pied-piping) or a category containing the lower V is deleted.[11] Deletion means that any kind of defect will not cause any problems on the PHON side.

Lasnik also discusses a parallel example involving matrix sluicing where he follows the standard assumption that sluicing is *wh*-movement followed by IP ellipsis.

(56) Speaker A: Mary will see someone.

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[11]This assumes that pseudogapping is derived through VP-deletion.

(57)   Speaker B: Who ~~Mary will see~~?

If there is no ellipsis, raising of the finite auxiliary is required.

(58)   *Who Mary will see?

The reasoning is parallel to the pseudogapping case: If the interrogative C contains a strong feature, then the matching feature of I must raise overtly to check it. It will then be phonologically defective and either pied-piping or ellipsis is necessary .

The next argument is the important one from the present point of view. Chomsky (1995c) argues that the EPP is instantiated as a strong feature on I, perhaps a D-feature, as Chomsky argues. Then, consider the following example.

(59)   Mary said she can't swim, even though she (really) can swim.

When this strong EPP feature attracts the matching feature of *she*, we get the sentence in (60), if pied-piping obtains.

(60)   Mary said she can't swim, even though she (really) can ~~swim~~.

However, analogous to the pseudogapping and sluicing cases above, we should also be able to raise just the relevant features of *she* if the phonologically defective *she* can be deleted. The problem is that such deletion is impossible, as (61) shows.

(61)   *Mary said she can't swim, even though (really) can ~~she swim~~.

Lasnik (2001a: 360) then argues that 'The only obvious way to exclude [(61)] is to demand that the subject raises. And the most straightforward way to guarantee that is to formulate the EPP so that it demands that the functional head of the clause have a specifier'. This argument of course rests on the existence of feature movement

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and feature strength (see Lasnik (1999) for more discussion of these issues), but insofar as that part of the argument holds up, then the argument in favor of a structural notion of the EPP that does not reduce to features seems convincing.

In this section, I have discussed a number of Lasnik's arguments that there has to be an EPP requirement in English. I have shown how I can basically follow Lasnik in arguing that the EPP is a structural requirement that T has a nominal specifier/sister. In the next section, I will discuss how expletives and pro-drop languages fit into the picture.

5.3.2 Expletives and pro-drop languages

This concludes my discussion of Lasnik's arguments against reducing the EPP to other principles. There are still a couple of issues I need to deal with before I can conclude this section. One issue involves sentences like (62) and (63).

(62)   It seems that Mary came.

(63)   There is a woman here.

As for (62), I argue that *it* is inserted as a language-specific last resort operation (cf. Marantz (1991)) if there is no available nominal to merge with T. It has to be a nominal, since inserting an adverb is not sufficient (64).

(64)   *Yesterday was raining.

(65)   Yesterday there was rain.

This way of looking at *it* expletives may lead to a problem for locative inversion, if locative inversion involves movement to SpecTP.

(66)   Down the hill rolled John *t*.

However, it is not clear that *into the room* is in SpecTP, even though Collins (1997) argues that it is. Collins assumes that the subject is in SpecVP and that the finite verb moves to T. If this is true, it would be the only case in English where a main verb moves that far. Collins explicitly argues that we need to widen the EPP so that it also drives the movement in (66). On the present approach, this could also be done, if it really turns out that locative inversion involves movement to SpecTP. That would mean that T has a requirement that it merges with either a nominal or a PP. Again, we need to exclude verbal elements like VoiceP, and other adverbs as in (64). I hope to return to the problem of locative inversion in future work.

Returning to (63), I will follow Bowers (2002), Richards and Biberauer (2005), Deal (2009) and Alexiadou and Schäfer (2010) and argue that *there* is actually inserted in the argument domain and that it moves to SpecTP. This is similar to other suggestions by Hornstein and Witkos (2003), Kayne (2008) and Hornstein (2009); see also the references cited in Richards and Biberauer (2005) for earlier proposals in the same spirit. I will not delve into the mechanics here because they do not really matter. Suffice it to say that if *there* moves to SpecTP, then this movement will satisfy the EPP requirement on T, just like any ordinary movement of the subject does.

A note on V2 languages like German and Norwegian is necessary at this point. These languages need to insert an expletive when a non-argument is sentence-initial, as in (67).

(67) I   dag er *(det) fint ute.
      in day is it   nice outside
      'Today it's nice outside.'

Norwegian does not have a distinction between *it* and *there* (see Hestvik (1986),
Åfarli (1992) for an analysis of some relevant differences between English and Nor-
wegian). However, I claim that the expletive *det* should be analyzed like the English
there in that it moves from its base position for purposes of linearization. There do
not seem to be any relevant differences between English and Norwegian that would
speak against such a claim. In Norwegian, the verb also moves at least to T, as can
be seen by the fact that the verb crosses the adverb *ofte* 'often' in (68).

(68) Marie spiser ofte   kake.
      Mary eats   often cake
      'Mary often eats cake.'

Therefore, the child has to assume that both the subject and the verb move in
Norwegian.[12]

Since we are in the Scandinavian corner, the reader may wonder how I will
analyze transitive expletive constructions of the kind that we find in Icelandic. A
representative example is given in (69).

(69) Það   borðuðu sennilega margir jólasveinar   bjúgun.
      there ate   probably many   Christmas.trolls the.sausages
      'Many Christmas trolls probably ate the sausages.'

      (Bobaljik and Jonas 1996: 196)

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[12]I set aside whether in sentences such as (67), there is movement of both the verb and the
subject to the left periphery. See Travis (1984), Vikner (1996), Zwart (1997) for much discussion.

Bobaljik and Jonas argue that the subject in (69) occupies SpecTP.[13] They go through several diagnostics, and show data where subjects in transitive expletive constructions precede shifted direct objects. Similar examples have been attested for Dutch, as shown in (70).

(70)   ... dat er   veel mensen dat boek [$_{VP}$ gisteren   [$_{VP}$ gekocht hebben]].
          that there many people the book   yesterday   bought have

'... that many people bought the book yesterday.' (Zwart 1992: 489)

Movement of the subject to SpecTP follows from the EPP requirement on T. As for the expletive, this has to be merged in a higher projection. Bobaljik and Jonas (1996: 217) put it in SpecAgr$_S$P (cf. Vangsnes (2002)), whereas Christensen (1991), among others, argue that it is base-generated in SpecCP. Exactly where the position is does not matter for present purposes as long as it has an EPP feature that triggers a last-resort insertion of the expletive.[14]

The other issue involves *pro*-drop languages like Italian (71).

(71)   Ho   telefonato.
          have.1.SG telephoned
          'I have telephoned.' (Haegeman 1994: 453)

There are various ways *pro*-drop can be analyzed. If there is a silent *pro* in SpecTP (Rizzi 1982), then this *pro* would satisfy the EPP. Alexiadou and Anagnostopoulou (1998) argue that the EPP can be satisfied in two different ways: Either by T

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[13]See Vangsnes (2002) for more discussion and data not discussed by Bobaljik and Jonas.

[14]I will not deal with impersonal null subjects in Icelandic; see Sigurðsson and Egerland (2009) for much discussion.

merging with a phrase or by the verbal morphology on T as long as this has the requisite nominal feature (Taraldsen 1978). Here I am going to assume the analysis given in Alexiadou and Anagnostopoulou (1998). This means that there is no need for a *pro* in the grammar of Italian, which Manzini and Savoia (1997) independently argue against.[15]

In this section, I have argued that my approach developed in chapter 4 can account for the EPP in English by following Lasnik's proposal that the EPP is a requirement that T needs a nominal specifier. Let us by way of summary consider the sentence in (72).

(72)   Mary loves John.

This sentence will have the following derivation, where the parentheses indicate what the next step of the derivation will be.

(73)   [$_{FP}$ F loves] (Spell out *loves*, merge *John*)

(74)   [$_{FP}$ John F] (Merge Voice)

(75)   [$_{VoiceP}$ Voice [$_{FP}$ John F]] (Spell out FP, merge *Mary*)

(76)   [$_{VoiceP}$ Mary Voice] (Merge T)

(77)   [$_{TP}$ T [$_{VoiceP}$ Mary Voice]] (Copy *Mary*, spell out VoiceP, remerge *Mary*)

(78)   [$_{TP}$ Mary T]

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[15]It is worth noting that Italian is one of the *pro*-drop languages that does not allow VSO orders, unlike languages such as Greek, Romanian and Spanish. Being a *pro*-drop language and having VSO orders are presumably two independent properties and my theory does not predict that they should be intimately related. Thanks to Artemis Alexiadou (p.c.) for bringing up this issue.

This derivation shows that a copy of *Mary* is made and this copy remerges with the T head, which fulfills the EPP requirement. In the next I will elaborate more on how movement has to be understood in the present framework.

5.4 Movement

If Spell-Out is as dynamic as I have suggested, a crucial question is how movement is possible. A couple of examples are provided in (79)-(81).

(79)   What did you eat?

(80)   Every quarterback, three video games taught two new plays.

(81)   Read the book Mary did.

I will go through how (79) and (81) work in some detail.

In order for movement to take place, a copy has to be made. Since the direct object or the Theme will be spelled out as soon as an Applicative or an Agent is merged, it is important that a copy of the object is made upon Spell-Out. This copy can for example be made due to a feature on the direct object that triggers movement. This copy can be put in a separate workspace and then be remerged later in the derivation. Note that this requires a conception of movement that is close to Nunes (2004), who in turns develops the theory in Chomsky (1995c). For Nunes, movement is decomposed into four different and more basic operations. These are given in (82)-(85).[16]

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[16]Nunes (2001, 2004) and Hornstein and Nunes (2002) present further evidence in favor of this conception of movement based on the fact that it allows sideward movement.

(82) Copy

(83) Merge

(84) Form Chain

(85) Chain Reduction

The Spell-Out system I am advocated forces us to decompose Movement as two operations, Copy and Merge. Since the original occurrence of *what* in (79) will be spelled-out, a copy of *what* needs to be made. This copy can then be remerged.

I assume that each derivation is a series of steps that constructs a syntactic object based on lexical items. We can define each stage of a derivation by a lexical array and a workspace (Collins and Stabler 2011).

(86) A *stage (of a derivation)* is a pair S = <LA, W>, where LA is a lexical array and W is a set of syntactic objects. In any such stage S, we will call W the *workspace* of S.

The assumption is that several workspaces can be involved in the construction of a sentence. There is one workspace for the main spine of the sentence and then another one for storing copies until they can be merged. Invoking multiple workspaces is not something that is novel with the present theory. Whenever, say, a complex nominal phrase is merged as a specifier of a projection in a standard theory, this complex nominal phrase has been constructed in a separate workspace before the entire phrase is merged to the clausal spine. Thus workspaces are needed, and I am just saying that a syntactic object can remain in a workspace until it is merged. Again, this is hardly anything new.

It is not irrelevant where the copy gets remerged. Considerations of what the appropriate logical forms are come into play. The example in (80) shows that topicalization can apply to one of the core sentences we discussed in chapter 3. The logical form at least needs to have separate conjuncts for the predicate and the arguments. In order for this to happen, the order of the derivation has to be as described in chapter 4. The Agent is above the Theme which is above the verb. This has implications for where the first copy of *what* can remerge in the example in (79). It has to be remerged with Voice, after the Agent has to be merged. This means that the Agent and Voice will Merge and then the Agent has to undergo Spell-Out before *what* can be merged with Voice. This complies with standard phase-based analyses of *wh*-movement where the *wh*-constituent moves to the edge of the *v*-phase, cf. Chomsky (2000a, 2001).

A derivation for (79) would therefore look as follows:

(87)   a.   Merge *eat* and F.

       b.

$$
\begin{array}{c}
\text{FP} \\
\diagdown \\
\text{F} \quad \text{VP} \\
| \\
\text{eat}
\end{array}
$$

(88)   a.   Spell out *eat* and merge *what* with F.

       b.

$$
\begin{array}{c}
\text{FP} \\
\diagdown \\
\text{what} \quad \text{F}
\end{array}
$$

(89)   a.   Merge the head Voice to the spine.

b.

$$
\begin{array}{c}
\text{VoiceP} \\
\diagup\diagdown \\
\text{Voice} \quad \text{FP} \\
\diagup\diagdown \\
\text{what} \quad \text{F}
\end{array}
$$
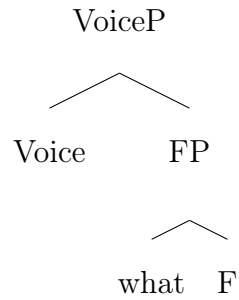
(90) a. Spell out the complement of Voice, make a copy of *what*, and merge *you*.

b.

$$
\begin{array}{c}
\text{VoiceP} \\
\diagup\diagdown \\
\text{you} \quad \text{Voice}
\end{array}
$$
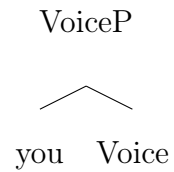
(91) a. Spell out the complement of Voice (*you*), make a copy of *you*, and merge

what.

b.

$$
\begin{array}{c}
\text{VoiceP} \\
\diagup\diagdown \\
\text{what} \quad \text{Voice}
\end{array}
$$

(92) a. Merge T.

b.

$$
\begin{array}{c}
\text{TP} \\
\diagup\diagdown \\
\text{T} \quad \text{VoiceP} \\
\diagup\diagdown \\
\text{what} \quad \text{Voice}
\end{array}
$$
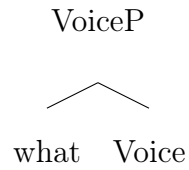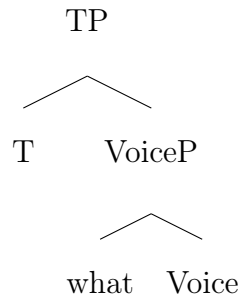
(93) a. Make a copy of *what*, spell out the complement of T, and merge *you*.

b.

$$
\begin{array}{c}
\text{TP} \\
\diagup\diagdown \\
\text{you} \quad \text{T}
\end{array}
$$

(94) a. Merge C.

b.

CP
```
        ╱╲
       C    TP
            ╱╲
          you   T
```
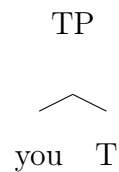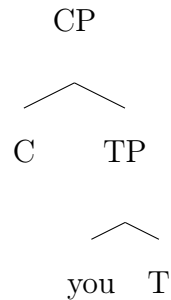
(95)　a.　Spell-out the complement of C and merge *what*.

　　　b.

CP
```
        ╱╲
     what    C
```
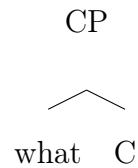
As this derivation shows, it is occasionally necessary to keep multiple copies in the workspace. In this case, both *what* and *you* have to be in the workspace and the correct elements have to be merged. If we enrich our lexical items with features, then it is easy to enforce that, say, T merges with *you* and not *what*. However, I have not done that here in order to keep things cleaner, and because it is not clear that anything would go wrong where T and *what* to merge before T and *you* merge.

This analysis extends to the VP-fronting case in (81). Because the verb and the Theme will be in separate Spell-Out domains, *fond-of* will have to move to the left periphery of the sentence separately from *many books*. This has actually been proposed as one possible derivation for VP-fronting by Rimell and Leu (2005). Rimell and Leu are concerned with scopal ambiguities in English and Swiss German, and they argue that different readings correspond to different derivations that have identical surface strings. One is a derivation where both the VP and the Theme together move to the left periphery the other, and more interesting for our purposes, is one in which the Theme moves separately to the left periphery and then the rem-

nant VP moves after the Theme has moved. I am not going to take over the details of their proposal, but my own proposal modifies their second proposal, namely that the verb and the Theme move separately to the left periphery.

Below I give a possible derivation for the sentence in (81).

(96)   a. Merge *read* and F

        b.

```
                FP
               /\
              F   VP
                  |
                 read
```

(97)   a. Make a copy of *read*, spell out *read*, and merge *the book* with F.

        b.

```
                FP
               /\
          the book   F
```

(98)   a. Merge the head Voice to the spine.

        b.

```
                VoiceP
               /\
          Voice       FP
                     /\
                 the book   F
```
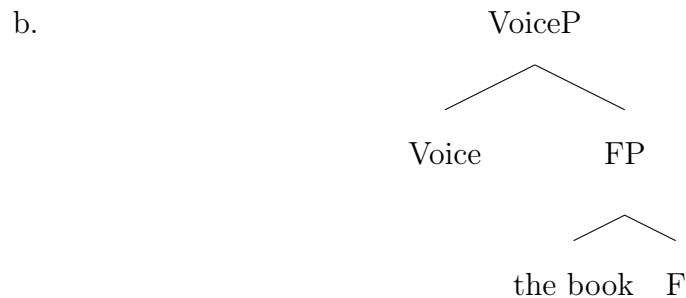
(99)   a. Make a copy of *the book*, spell out the complement of Voice, and merge *Mary*.

        b.

```
                VoiceP
               /\
          Mary    Voice
```

(100) a. Merge T/*did*

     b.

```
                    TP
                   /  \
                  T    VoiceP
                       /   \
                    Mary   Voice
```
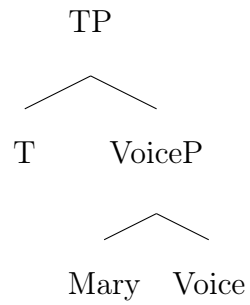
(101) a. Make a copy of *Mary*, spell out the complement of T, merge *Mary* with T.

     b.

```
                    TP
                   /  \
                Mary   T
```

(102) a. Merge C

     b.

```
                    CP
                   /  \
                  C    TP
                       /  \
                    Mary   T
```
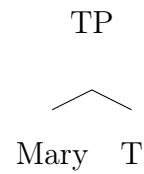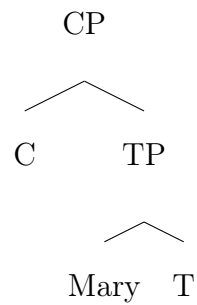
(103) a. Spell-out the complement of C and merge *the book*.

     b.

```
                    CP
                   /  \
            the book   C
```
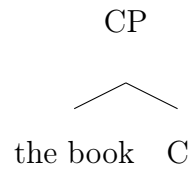
(104) a. Spell-out the complement of C and merge *read*.

     b.

```
                    CP
                   /  \
                read   C
```
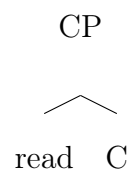
Note that I skipped intermediate movement through the Voice edge, but that can of course be accommodated if there is empirical evidence that it happens. Crucially, for the linear order to come out correctly, it is important in which order *the book* and *read* are merged. This can be ensured by adopting a richer left periphery where different heads have features for different constituents, say, for a verb and a DP.

There is another example that it is relevant to discuss, as it involves what appears to be pied-piping of an entire relative clause. Consider the following example:

(105)   The man who smokes killed Mary.

Assuming the theory of relative clauses in Bianchi (1999), who extends the proposal in Kayne (1994), the standard structure for this sentence is provided in (2). G stands for any functional projection.

(106)

```
                    DP
                  /    \
               the      CP
                      /    \
                  man_i     C'
                          /    \
                        C       GP
                              /    \
                           DP_j     G'
                          /   \    /   \
                       who  t_i  G     TP
                                        |
                                    t_j smokes
```

192
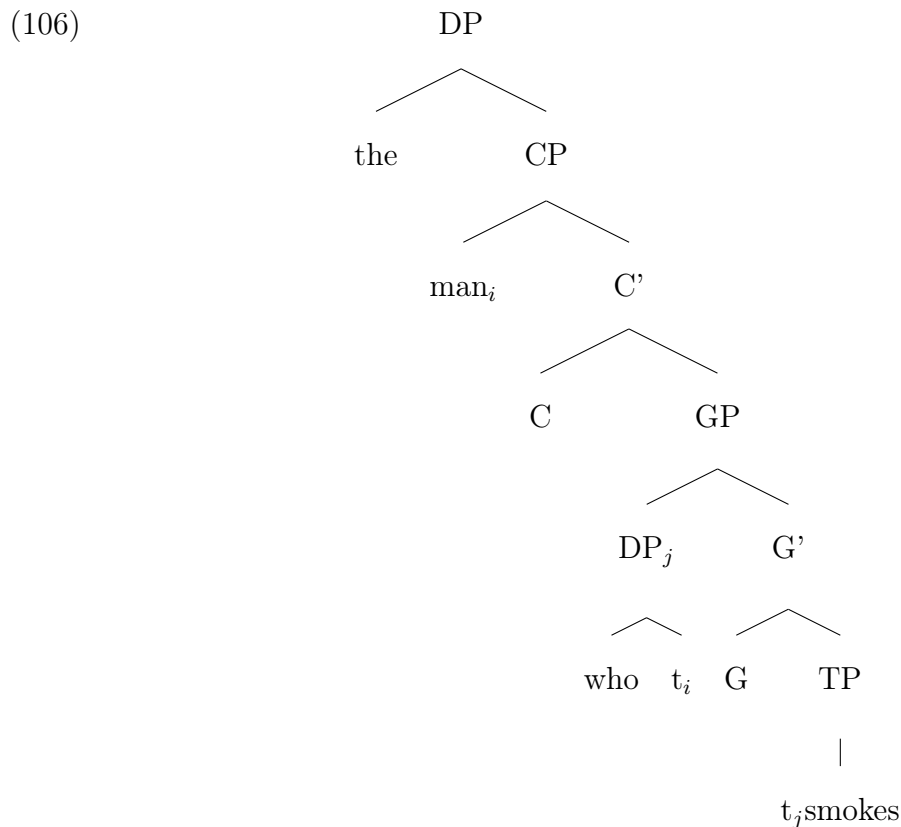
In order to analyze this sentence in the following system, we need to distinguish between two workspaces: One workspace for the main spine of the clause and one workspace for the relative clause. This is required since the relative clause is a complex DP. Note that this is not different from standard theories: They all assume that the relative clause is constructed before it is merged with main clause.[17]

For the main spine of the tree, we have the following derivation. I will shortly discuss why only *the man* is merged into this structure.

(107) $[_{FP}$ F killed $]$ (Spell-out *killed*, merge *Mary*)

(108) $[_{FP}$ Mary F $]$ (Merge Voice and FP)

(109) $[_{VoiceP}$ Voice $[_{FP}$ F VP $]]$ (Spell-Out FP, merge *the man*)

(110) $[_{VoiceP}$ [the man] Voice $]$ (Merge T)

(111) $[_{TP}$ T $[_{VoiceP}$ [the man] Voice $]$ (Copy *the man*, spell out VoiceP, remerge)

(112) $[_{TP}$ [the man] T $]$

The parentheses indicate the next operation, and I abstract away from the C projection.

The relative clause has the following derivation:

(113) $[_{FP}$ F smokes $]$ (Merge Voice and FP)

(114) $[_{VoiceP}$ Voice $[_{FP}$ F smokes $]]$ (Spell-Out FP, merge *man who*)

(115) $[_{VoiceP}$ [man who] Voice $]$ (Merge T)

---

[17]Observe that Late Merge theories do not work because you cannot Merge the entire relative clause into the main spine. This raises questions of how to deal with the Freidin-Lebeaux effects discussed in Chomsky (1995c).

(116) $[_{TP}$ T $[_{VoiceP}$ [man who] Voice] (Copy *man who*, spell out VoiceP, remerge)

(117) $[_{TP}$ [man who] T] (Merge G)

(118) $[_{GP}$ G $[_{TP}$ [man who] T]] (Copy *man who*, spell out TP, remerge)

(119) $[_{GP}$ [man who] G] (Merge C)

(120) $[_{CP}$ C $[_{GP}$ [man who] G]] (Copy *man*, spell out GP, remerge)

(121) $[_{CP}$ man C] (Merge *the*)

(122) $[_{DP}$ the $[_{CP}$ man C]]

Again, the parentheses indicate the next operation that will happen. The final structure here is what is being merged into the main spine in (109) above. That is, we now see why only *the man* is merged into the structure, and not the entire relative clause.

However, this appears to yield a problem for linearization. The main spine just gives us *the man killed Mary*, and not *The man who smokes killed Mary*. If it is correct that this is a problem of linearization, then we essentially need a statement that *who* follows *man*. If *who* follows *man*, and *who* precedes *smokes*, then *man* will also precede *smokes* by transitivity. Furthermore, C in the relative clause precedes *who*, and *man* precedes C. In the main clause *the man* precedes *killed Mary*. Thus it does not matter that we are dealing with two workspaces here - the linearization will come out correctly. Needless to say, this depends on a theory of linearization and copy realization, e.g., where the highest copy is typically pronounced Nunes (2004). Attempts at developing theories of linearization can be found in Idsardi and Raimy (In press) and Lohndal and Samuels (2010).

One thing that it is important to mention is that movement requires multiple copies. I follow Hornstein (1995a) in assuming that only one copy is relevant at the CI interface. We also need a more complex theory of the PF interface that will ensure that the topmost copies are pronounced, generally speaking. See Nunes (2004) for important discussion.

There is one more consequence that I would like to bring out.[18] The theory that I am advocating entails that multidominance representations cannot exist. Let us consider why.

Chomsky (2004) argues that there is only Merge and that it there are two versions: External Merge and Internal Merge (see, among others, Epstein et al. (1998), Starke (2001)). Others argue that there are still differences between the two types of Merge and that they do not reduce to a common source (Brody 2006, van Gelderen 2008). A third element in this debate is whether there are more than just External and Internal Merge. Citko (2005: 476) argues that there is:

(123)   'The existence of External Merge and Internal Merge predicts the existence of a third type, combining the properties of both. This third type, which I will refer to as *Parallel Merge*, is like External Merge in that it involves two distinct rooted objects (α and β), but it is like Internal Merge in that it combines the two by taking a subpart of one of them [...]'.

Parallel Merge is also known as multidominance, and a typical multidominance structure looks as follows:

---

[18]Thanks to David Adger (p.c.) for discussion that made me realize this consequence.

(124)

```
            α
           / \
          /   \
         α     γ
```

(125)

```
      α        β
     / \      / \
    /   \    /   \
   α     γ        β
```
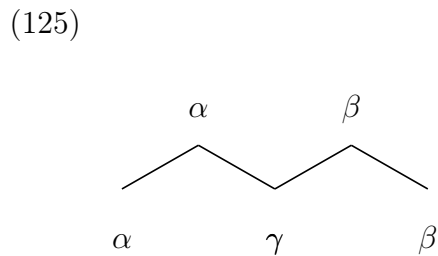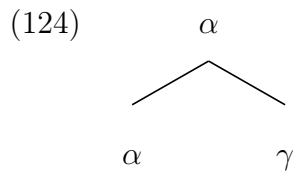
Various scholars have given arguments that multidominance exists and that it can be fruitfully applied to different empirical phenomena. A couple of examples are across-the-board *wh*-questions (Citko 2005) and right node raising (see already McCawley (1982)).

(126)   I wonder what Gretel recommended and Hansel read.

(127)   a. Ivan bought, and Ivy read, the book.

b.
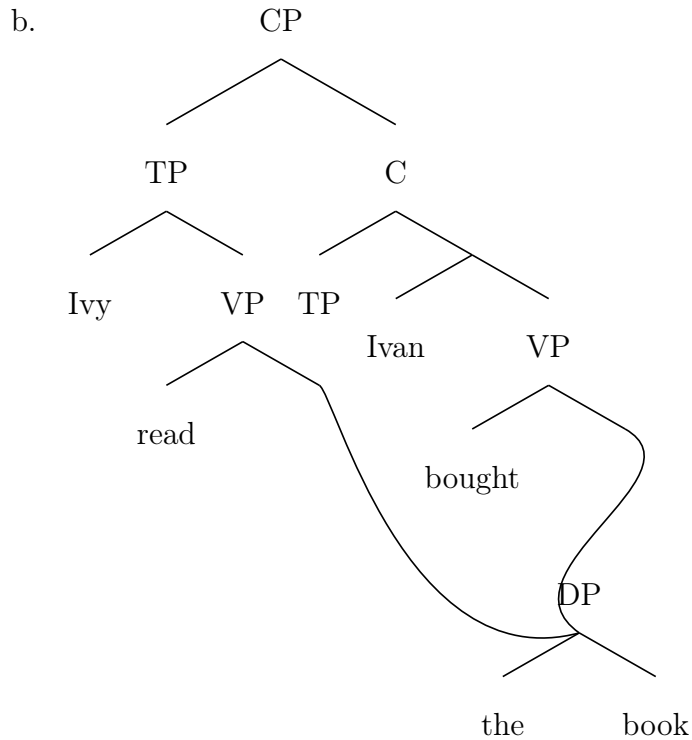
In discussing right node raising, Larson (2011, In press) argues that neither a multidominance approach, a deletion account or a movement account can account for all the data. To give an example, the multidominance approach does not make different predictions for the following two sentences (modeled on Kayne (1994: 67)):

(128)   a. Ivan bought, but Ivy didn't read, any books.

        b. *Ivan didn't buy, but Ivy read, any books.

In the tree above, the same relation holds between the conjunct with the negation and the shared object and the conjunct without the negation and the shared object.

A general problem for multidominance approaches is that they do not fit in nicely with phase-based derivations. A representation such as (127b) cannot be construed in a phase-based derivation. The reason is that the shared object *the book* will be spelled out in one conjunct before the other conjunct is merged. The

same reasoning holds for long-distance *wh*-questions, where the original landing cite and the intermediate landing site in the embedded SpecCP will both be spelled out when copy is merged in the matrix SpecCP.

(129)   What did John tell Mary that Bill bought?

In standard phase theory, you only get multidominance representations *phase-internally*. The approach to Spell-Out I have developed above excludes multidominance representations entirely. Larson (2011) has shown that this may be a desirable outcome. See his paper for an alternative analysis of right node raising that would be compatible with the present theory of Spell-Out.

In the next section, I will go on to say something about how locality fits into the current model.

5.5   Some Notes on Locality and Agreement

The present theory has several other consequences. It goes beyond the limit of this thesis to explore all of them, but here I will discuss a couple of rather striking consequences. One consequence of a specifier-less theory is that one cannot say that specifiers are islands for extraction as in Huang (1982)'s Condition on Extraction Domains. Another consequence is that the domain of application for Agree is smaller than on most other approaches. I will start out by discussing locality and then turn rather briefly to agreement.

5.5.1 Locality

On a specifier-less approach, there is an obvious question that arises concerning locality.[19] There is a well-known asymmetry between complements and left branches like specifiers. The latter does not allow sub-extraction whereas the former does. (130)-(131) give examples of sub-extraction in English and (132) shows that sub-extraction from a direct object is perfectly OK. For completeness, (133) shows that you can also move the entire object to the left periphery.[20]

(130)   *$[_{CP}$ [Which Marx brother]$_i$ did $[_{TP}$ she say $[_{CP}$ $[_{IP}$ [a biography of t$_i$] is going to be published/will appear this year]]]]?

(131)   *$[_{CP}$ [Which Marx brother]$_i$ did $[_{IP}$ she say $[_{CP}$ that $[_{IP}$ [a biographer of t$_i$] interviewed her/worked for her]]]]? (Merchant 2001: 185)

(132)   What$_i$ did Mary take [a picture of t$_i$]

(133)   What$_i$ did John eat t$_i$?

On the assumption that indirect objects are specifiers too (see Larson (1988) and research following him), we expect them to not allow sub-extraction. This is indeed the case, which Culicover and Wexler (1973: 26) already noted. (135) gives a relevant example.

(134)   I send a friend of Peter a book.

---

[19]I will not have anything to say about adjuncts here, since the presence or absence of specifiers does not relate specifically to that issue, though see Kayne (1994).

[20]As for to movement of subjects in English, this is complicated by the existence of *that*-trace effects. See Lohndal (2009, 2011b) for comprehensive discussion and references.

(135) *Who$_i$ did you send [a friend of t$_i$] a book? (Lohndal 2011b: 189)

These data have been used to motivate an account of these extraction effects that rely on the difference between specifiers and complements. This has been implemented in various ways throughout the years and was first stated by Huang (1982) in his Condition on Extraction Domains (see also Kayne (1984), Chomsky (1986a), Lasnik and Saito (1992), Manzini (1992), Takahashi (1994), Müller (1998), Ochi (1999) for different accounts). More recently, Uriagereka (1999) and Nunes and Uriagereka (2000) have developed an account where the Spell-Out system is construed such that specifiers are always spelled out separately from the clausal spine. If that is the case, the ban on extraction from subjects follows.

Since there is no way to create a distinction between specifier and complements within my approach, it would be a bad result if these locality data really necessitate such a distinction. Interestingly, there are data that show that the data above provide a simplified picture. Starke (2001: 36) gives an example from French (136) where sub-extraction from subjects in SpecTP is possible.

(136) [$_{CP}$ [De quel film]$_i$ est-ce que [$_{IP}$ tu   crois [$_{CP}$ que [$_{IP}$ [la   première
           of which film is-it   that you think that   the   first part
       parte t$_i$] va   créer un   scandale?
       goes   create a   scandal
       'Which movie do you think that the first part of would create a scandal?'

Similarly, Abels (2008: 76) provides the example in (137) from German.

(137) [$_{CP}$ Von diesem Film]$_i$ hat [$_{IP}$ [der erste Teil t$_i$] doch letztes Jahr einen
           of   this   film has   the first part   PRT last   year a
       großen Skandal ausgelöst]].
       big   scandal caused
       'The first part of this film caused a big scandal last year.'

In a quite comprehensive cross-linguistic study, Stepanov (2007) presents a range of cases where extraction from subjects is reported to be good. A couple of examples are provided in (138)-(139) where (138) is from Japanese and (139) is from Hungarian.

(138) [Op [Mary-ga   t yonda no]-ga   akirakana yorimo John-wa   takusan-no
           Mary-NOM   read   that-NOM is.obvious than   John-TOP many-GEN
       hon-o   yonda.
       book-ACC read
       '(*) John read more books than [that Mary read _] is obvious'. (Stepanov 2007: 89)

(139) Melyik színéznőnek$_i$ gondolja János, hogy t$_i$ a   fényképe   meglett?
       which actress's   thinks Janos that   the picture.her turned.up
       'Which actress does John think that a picture of _ turned up?' (Stepanov 2007: 90).

Spanish is also a language where you can extract out of a subject, but crucially if it is in a post-verbal position, as shown by Uriagereka (1988: 118). The contrast is illustrated in (140)-(141).

(140) [$_{CP}$ [De qué   conferenciantes]$_i$ te   parece   [$_{CP}$ que [$_{IP}$ me
            of   what speakers   CL.to.you seem.3.SG   that   CL.to.me
       van   a impresionar [las propuestas t$_i$]]]]?
       go.3.SG to to.impress   the proposals
       'Which speakers does it seem to you that the proposals by will impress me?'

(141) *[$_{CP}$ [De qué   conferenciantes]$_i$ te   parece   [$_{CP}$ que [$_{IP}$ [las
             of   what speakers   CL.to.you seem.3.SG   that   the
       propuestas t$_i$] me   van   a impresionar]]]?
       proposals   CL.to.me go.3.SG to to.impress
       'Which speakers does it seem to you that the proposals by will impress me?'

Even in English, sub-extraction from a post-verbal DP is possible. The contrast between (142) and (143) is taken from Merchant (2001: 187).

(142) [$_{CP}$ [Which candidate]$_i$ were [$_{IP}$ there [posters of t$_i$] all over the town]]?

(143) *[$_{CP}$ [Which candidate]$_i$ were [$_{IP}$ [posters of t$_i$] all over the town]]?

Note that the approach by Uriagereka (1999) and Nunes and Uriagereka (2000) does not make different predictions for extraction out of preverbal and postverbal subjects. A left-branch specifier is a left-branch specifier regardless and consequently sub-extraction should always be ruled out. The above data are therefore problematic for accounts that claim that specifiers are always immune to sub-extraction.[21]

Based on the data just discussed and other data, new accounts have been developed of CED effects, e.g., Stepanov (2007), Boeckx (2008), Hunter (2010), Jurka (2010), Lohndal (2011b), Müller (2010). These accounts do not rely on differences between specifiers and complements as units that the grammatical operations refer to.[22] To the extent that this is a successful approach, it solves the problem that the present approach at first glance faces, namely that locality considerations seem to force us to let grammatical operations refer to specifiers. The latter is not necessary if the data require a different account, which the recent literature argues is the case. Therefore I conclude that locality issues per se do not constitute a problem for an approach that does not have specifiers. This is not to say that there are not other problems and issues that the current framework has to deal with, involving e.g., ellipsis and subjacency effects, but I will not discuss these here.

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[21]See Uriagereka (2011) for a reply to this criticism and for a discussion of how to remedy this in his Multiple Spell-Out framework.

[22]For Jurka, there is a specifier effect, but also a movement effect.

5.5.2 Agreement

Given the relatively small Spell-Out domains that I am advocating, the present system will have quite strong restrictions on how feature dependencies can be created. In particular, feature dependencies will have to be shorter than typically assumed in standard Agree approaches (see Chomsky (2000a) and much literature following this paper). T can still agree with the subject since both are in the same domain, but T will not be able to agree with the object directly, as has been argued to be the case in dative-nominative constructions in Icelandic, cf. e.g., Richards (2004). However, what is possible, is for transitive Agree to happen. That is, what looks like long-distance agreement can happen in intermediate steps so that in a configuration x > z > y, x and y agree by virtue of y agreeing with z and x agreeing with z. If we consider a typical derivation, we will see how this works. Look at the sentence in (144).

(144)   John likes himself.

This sentence will have the following derivation:

(145) $[_{FP}$ F likes $]$ (Spell out *likes*, merge *himself*)

(146) $[_{FP}$ himself F $]$ (Merge Voice)

(147) $[_{VoiceP}$ Voice $[_{FP}$ himself F $]]$ (Spell out FP, merge *John*)

(148) $[_{VoiceP}$ John Voice $]$ (Merge T)

(149) $[_{TP}$ T $[_{VoiceP}$ John Voice $]]$ (Copy *John*, spell out VoiceP, remerge *John*)

(150) $[_{TP}$ John T $]$

The reader will notice that *John* and *himself* are not in the same Spell-Out domain during the derivation. This may pose a problem for binding theory, if binding theory requires there to be, say, a c-command relation between the reflexive and its antecedent. However, the problem is only apparent. If one adopts the Agree theory of binding, where the reflexive agrees with a functional head that then agrees with its antecedent (Reuland 2001, 2011), there is no problem. On this view, *himself* agrees with F, F agrees with Voice, and Voice agrees with *John*. That is one way of implementing agreement in a step-wise fashion. Another view is that binding essentially is movement (Hornstein 2007) and that *John* and SELF start out as sisters, assuming that SELF is a head. The antecedent then moves to its surface position, which on my theory would work exactly as sketched above. I am not going to choose between these two theories of binding, but I hope it is clear that both of them can be implemented with the present theory of syntax.

Given that Spell-Out domains are relatively small, everything that looks like a long-distance agreement effect will in effect have to be deal with in the syntax as a result of many intermediate Agree relations. This sits well with arguments advanced by Koopman (2006) and Hornstein (2009) who argue that there is no such thing as long-distance agreement in the syntax and that all agreement configurations are strictly local. Whenever we see something that looks like long-distance agreement, Hornstein argues that movement has to be involved. Hornstein's view would also be straightforwardly compatible with the present theory. As Boeckx (2009) discusses, it is actually rather hard to find a genuine case of long-distance agreement. If that is true, then it would be a virtue to have a theory that does not allow for long-distance

agreement.

I want to point out that the present view dovetails quite nicely with late insertion frameworks such as Distributed Morphology (DM) (Halle and Marantz 1993) (see also McCawley (1968)). In DM, morphological realizations are dealt with in a post-syntactic component, i.e., PHON on the present view. Some researchers even argue that all agreement should be confined to this post-syntactic system (Bobaljik 2008), or even to semantics (Dowty and Jacobson 1989), but there are arguments that at least certain agreement dependencies are syntactic, cf. Svenonius (2007), Adger and Svenonius (2011).

In the next section, I will go on to discuss serial verbs.

5.6   Serial verbs

In this section I will show how serial verbs lend further support to the claim that each Spell-Out domain corresponds to a conjunct at logical form. The goal will be to argue for a particular syntactic representation, and then show how that representation maps onto logical forms.

Serial verbs are challenging for syntactic theory because serial verb constructions typically have one tense node but two or more verbs.[23] These verbs do not seem to be coordinated or subordinated. Two examples are provided in (151) and (152) from Edo and Nupe, taken from Baker and Stewart (2002: 2).[24]

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[23]This section builds substantially on Alexiadou and Lohndal (2011).

[24]This follows the orthography in Baker and Stewart (2002).

(151) Òzó ghá gbè èwé khièn. (Edo)
      Ozo FUT hit goat sell
      'Ozo will kill the goat and sell it.'

(152) Musa du   etsi kun. (Nupe)
      Musa cook yam sell
      'Musa cooked a yam and sold it.'

Importantly, these structures contain two transitive verbs and the second verb has no overt object. Instead, the object of the first verb is understood to be the object of the second verb. Baker and Stewart (2002) argue convincingly that this second verb instead has a pro; see their paper for justification.[25]

Baker and Stewart (1999) and Stewart (2001) argue that the two verbs can be coheads of the same VP, which entails a doubly headed analysis of serial verb structures. However, Baker and Stewart (2002) argue against this analysis on empirical grounds. If a double-headed VP is the correct structure, we expect the two verbs to behave alike. Baker and Stewart found at least one instance where this is not the case. They show that in Nupe, verbs can be doubled for focus reasons. However, only the first verb can be doubled, not the second one.

(153) Musa du   etsi du   kun. (Nupe)
      Musa cook yam cook sell
      'Musa DID cook the yam and sold it.'

(154) *Musa jun etsi du   kun.
   Musa   sell yam cook sell
      'Musa cooked the yam and DID sell it.'

Therefore, Baker and Stewart (2002) suggest that one of the vPs is adjoined

---

[25]See Jeong (2007) for an analysis involving sideward movement of the object of the second verb so that it also becomes the object of the first verb.

to the other vP. A somewhat simplified representation of their structure is provided

in (155).

(155)

```
                        VoiceP
                       /      \
                   agent      Voice'
                             /     \
                         Voice      vP
                                   /  \
                                 vP    vP
                                /\     /\
                               v  VP  v  VP
                                  /\     /\
                                 NP V   NP V
```
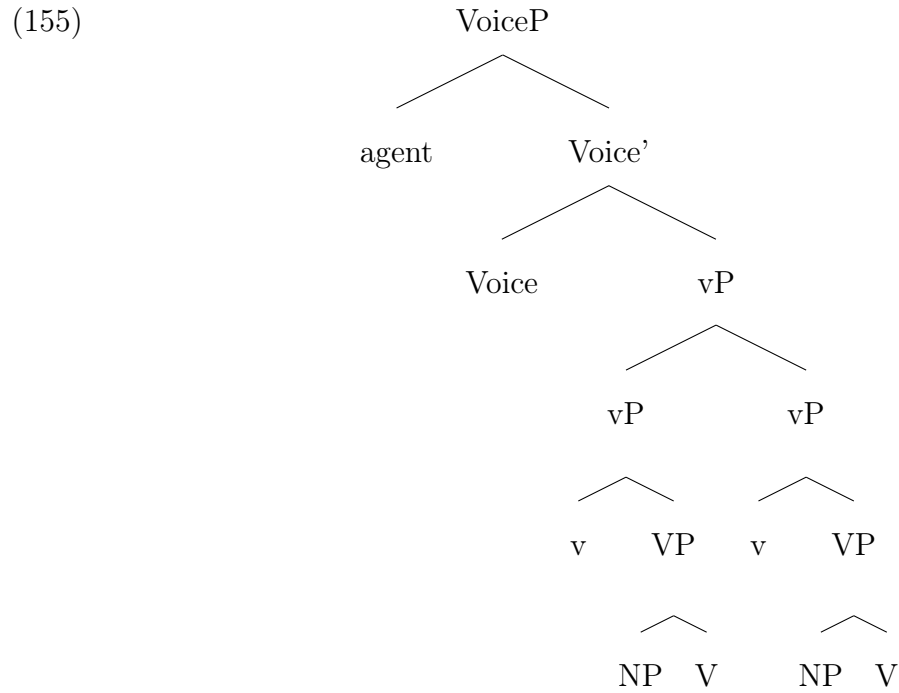
Baker and Stewart present a couple of arguments for why adjunction is needed

here. This rests on a comparison between consequential serial verb constructions

(153)-(154) and resultative serial verb constructions (156)-(157).

(156) Òzó ghá gbè èwé wù. (Edo)
       Ozo FUT hit goa die
       'Ozo will strike the goat dead.'

(157) Musa tse   èbi ta   èsákò o. (Nupe)
       Musa throw knife be.on table LOC
       'Musa there the knife onto the table.'

The difference between consequential and resultative serial verb constructions is that

in the latter case, the second verb is an unaccusative verb. Whereas consequential

serial verb constructions describe composite events where there are two distinct

subevents, resultative serial verb constructions describe a single event where the

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second verb characterizes a state that the object comes to be in as a result of the action denoted by the first verb (Baker and Stewart 2002: 3). Now, Baker and Stewart argue that in resultative serial verb constructions, the second verb can undergo complex predicate formation with the first verb. This is required in order for the second verb to be close enough to the object such that it can discharge its thematic role to the object. Concretely, for (157) they assume the syntactic structure in (158) and that the lower verb moves from its base position and adjoins to the higher verb (Baker and Stewart 2002: 32).

(158)

```
                        VP
                    /        \
                  NP          V'
                  |        /      \
                knife    V          V'
                         |       /      \
                       throw   V          V'
                               |       /      \
                             be.on   NP         P
                                     |          |
                                   table      t_LOC
```
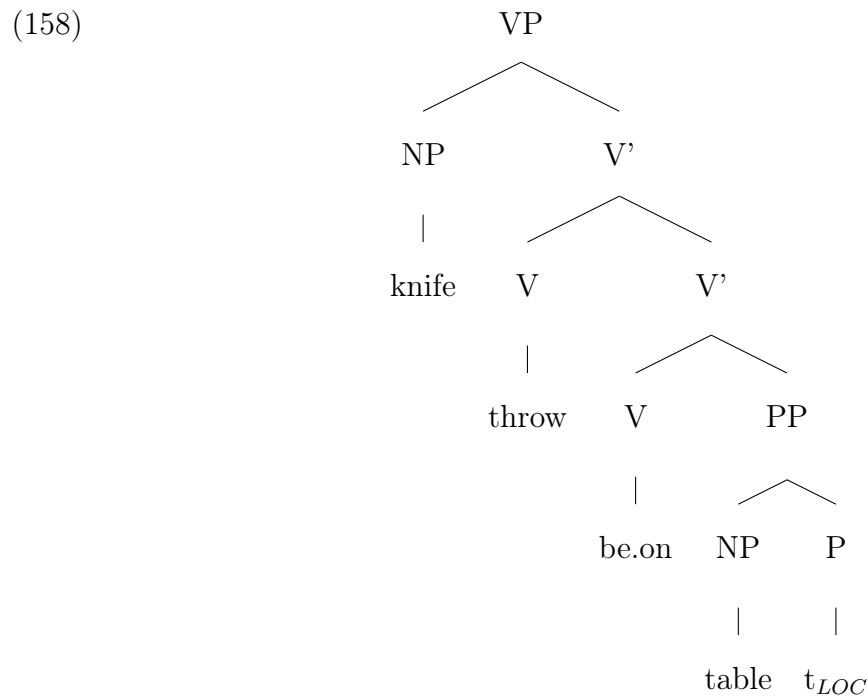
Crucially, this relies on the idea that head movement applies such that it feeds theta role assignment, building on an idea by Saito (2000). Baker and Stewart point out that we see V-V-incorporation overtly in resultative constructions in Igbo, which is a Nigerian language that is related to Edo and Nupe, but does not have serial verb constructions. They provide the example in (159) (Baker and Stewart 2002: 34).

(159) Obi kwá-dà-rà   Éz'e. (Igbo)
       Obi push-fall-FACT Eze
       'Obi pushed Eze down.'

So far this does not explain why such V-V-incorporation is not possible with two transitive verbs (160).

(160) *Àdá sì-rí   jí. (Igbo)
       Ada cook-eat-FACT yam
       'Ada cooked and ate the yams.'

To account for this, they invoke the idea that transitive verbs have more structure than unaccusative verbs. They argue that V can incorporate, but that transitive verbs have a v layer above V. Baker and Stewart claim that v is not a theta role assigner: 'V assigns Theme, and (active) Voice assigns Agent, but v assigns no theta-role; it only adds a semantic sense of causation and licenses accusative case on the object' (Baker and Stewart 2002: 34). They propose the condition in (161), which makes this clear.

(161) X and Y form a complex predicate only if there is some Z that X and Y both theta-mark.

Since there is this difference between consequential and resultative serial verb constructions, Baker and Stewart argue that a consequential serial verb construction 'does not have the same need to be the complement of V1 as VP does' (Baker and Stewart 2002: 37). Therefore they make the common assumption in (162).

(162) X can be the complement of Y if and only if X and Y enter into a thematic relationship.

This leads the authors to conclude that the second vP in a consequential serial verb construction has to be an adjunct, as in the representation in (155). They add two empirical pieces to support this claim.

Unlike in resultative serial verb constructions, in a consequential serial verb construction the second verb phrase can follow a goal PP or a resultative AP that is associated with the first verb. (163) contrasts with (164) (Baker and Stewart 2002: 36-37).

(163) Òzó rhié ùkpòn yè ékpétìn khién (Edo)
       Ozo put cloth in box   sell
       'Ozo put the cloth in a box and sold it.'

(164) *?Òzó fí   àkhé yè òtíkù guòghó.
       Ozo throw pot in trash break
       'Ozo threw the pot into the trash so that it broke.'

They also point out that VP-final adverbs and PP adjuncts can come before the second verb in Edo, contrary to resultative serial verb constructions. This contrast is provided in (165) versus (166) (Baker and Stewart 2002: 36-37).

(165) Òzó lé   èvbàré ègìégié/vbè òwá   ré. (Edo)
       Ozo cook food   quickly/in house eat
       'Ozo cooked the food quickly/at home and ate it.'

(166) *Òzó suá àkhé ègìégié/vbè òwá   dé.
       Ozo push pot quickly/in house fall
       'Ozo pushed the pot quickly/in the the house down.'

Baker and Stewart conclude that these data show that the second verb phrase is not the complement of the first verb phrase. Rather, it has to be some kind of adjunct.

However, this argument is not watertight. If the second verb phrase is an adjunct, then it should be possible to leave it out. If that happens, we are no longer

dealing with a serial verb construction. Furthermore, if there are differences in the syntactic structure for transitive and unaccusative verbs, then this might be related to the attachment site for adjuncts. A feasible analysis seems to be to say that adjuncts can adjoin to v but not to V, in which case the contrast between (163) and (164) and (165) and (166) would follow.

Alexiadou and Lohndal (2011) discuss these facts from the point of view of Distributed Morphology, and they argue that the correct syntactic structure looks like (167), where the verbs are created through a root combining with a verbal categorizer.

(167)

```
                    VoiceP
                   /      \
              agent       Voice'
                         /      \
                     Voice       FP
                                /    \
                           theme      F'
                                     /    \
                                    F      vP
                                          /    \
                                    √ROOT₂      v'
                                               /    \
                                              v      FP
                                                    /    \
                                               theme      F'
                                                         /    \
                                                        F      vP
                                                              /    \
                                                             v      √ROOT₁
```
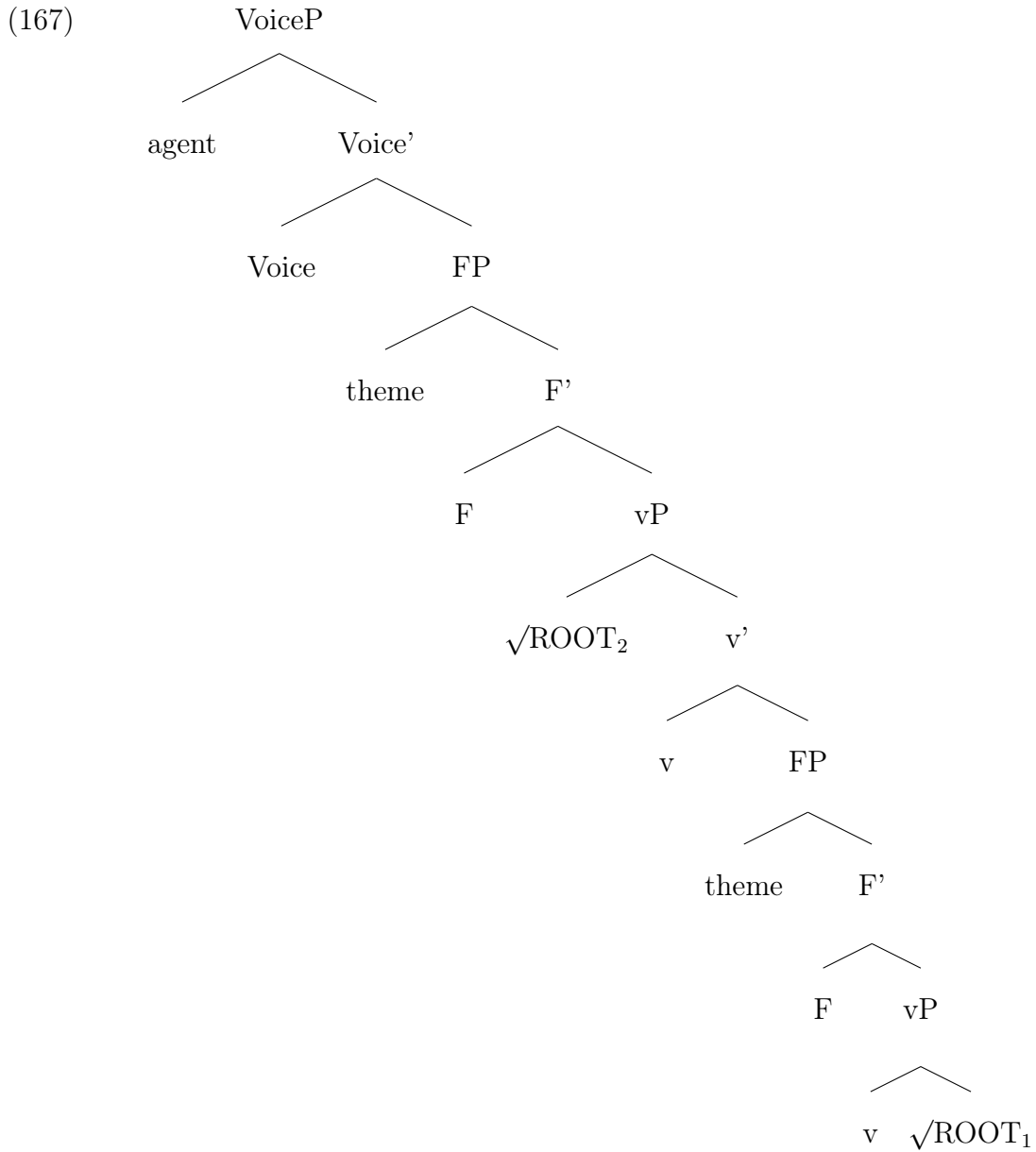
The structure in (167) has one unusual property, namely the way the second root is introduced. The root is in the specifier of a categorizing head, and not the complement of a categorizer, as is the case for the first root.

Alexiadou and Lohndal defend this structure in different ways, but I will not go through their arguments here. Instead I would like to argue that the present theory gives us a nice way of deriving the logical form for serial verb constructions.

Pietroski (2005a: 210-217) argues that serial verbs offer an additional argument for full thematic separation and that the correct logical form is one in which each argument and each predicate are interpreted as monadic predicates. Let us consider this in more detail.

An important fact here is the contrast between (168) and (169) (Pietroski 2005a: 210). This is a contrast between a serial verb construction from Edo and a construction with two overt objects in the same language.

(168) Òzó ghá lé   èvbàré ré
       Ozo will cook food   eat
       'Ozo will cook– and eat– the food.'

(169) Òzó ghá lé   èvbàré ré rè
       Ozo will cook food   eat it
       'Ozo will cook the food and then eat it.'

In (168), there is one big event with multiple stages. In (169), there are two events, where one events precedes the other. I have tried to incorporate this difference into the idiomatic translations. So we want a logical form that brings out this difference. Building on a note by Baker and Stewart (2002) that the right eventish semantics will ensure that *goat* is the Theme of both *hit* and *see* in (151), Pietroski provides a semantics that achieves this. The logical form for (151), repeated here for expository convenience, is roughly as in (171), based on Pietroski (2005a: 213)).

(170) Òzó ghá gbè è̱wé khiè̱n. (Edo)
       Ozo FUT hit goat sell
       'Ozo will kill the goat and sell it.'

(171) ∃e[Agent(e', Ozo) & hit(e) & Theme(e, goat) & sell(e) & Theme(e, pro)]

This logical form presupposes complex processes like *hitting the goat in order to sell*

it and doing so. This process begins with a cooking, its Theme is the food, it ends with an eating, and its Theme is the value of pro (Pietroski 2005a: 213). Thus there is one ongoing event where the Agent is related to the same process as the Theme(s). Based on the thematic predicates and the fact that there is only one kind of event variable in the logical form, one can assume that speakers can make a quick inference that we are dealing with an ongoing event. That is, as long as both verbs have the same event variable (e), they will be understood as part of the same event. If there are two event variables, as seems to be the case when there is an overt second object as in (169), then there are two different events.

I have set aside several details here, but if (171) is roughly the correct logical form for serial verbs, then the syntactic structure in (167) is exactly what is required. Each of the specifiers in that tree will constitute a separate Spell-Out domain, and will thus correspond to a conjunct at logical form.[26]

With this in hand, here is the derivation for the serial verb construction in (170). Note that I am assuming roots and categorizers here, since I do not see how else the verb will be introduced into the structure. I am also using English words in the derivation for the sake of exposition.

(172)   a. Merge F and the vP (consisting of the categorizer and the root $\sqrt{}$SELL).

   b.   FP
                                         /\
                                        F vP

---

[26]Note that this also makes it possible to say that the second root in (167) is actually not really a specifier, and one can maintain that all roots are complements of a categorizer.

(173)   a.   Spell out vP, merge *pro.*

        b.

```
                    FP
                   /\
                pro   F
```

(174)   a.   Merge v and FP.

        b.

```
                    vP
                   /\
                 v    FP
                     /\
                  pro   F
```

(175)   a.   Spell out FP, merge the root $\sqrt{\text{HIT}}$.

        b.

```
                    vP
                   /\
             √HIT    v
```

(176)   a.   Merge F with vP.

        b.

```
                    FP
                   /  \
                 F     vP
                      /\
                 √HIT    v
```

(177)   a.   Spell out vP, merge *goat.*

        b.

```
                    FP
                   /\
               goat   F
```

(178)   a.   Merge Voice.

b.
$$\text{VoiceP} \overbrace{\text{Voice} \quad \text{FP} \overbrace{\text{goat} \quad \text{F}}}$$
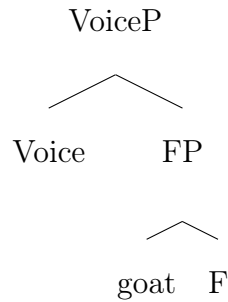
(179)   a. Spell out FP, merge *Ozo*.

b.
$$\text{VoiceP} \overbrace{\text{Ozo} \quad \text{Voice}}$$
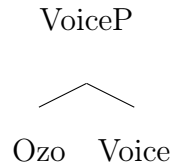
I won't continue the derivation, but this shows how it works. As the reader will be able to verify, each Spell-Out domain will, as before, correspond to a conjunct at logical form. I take serial verbs to provide further support in favor of the theory since we do not need any additional mechanisms to analyze such structures.

In the next section, I will discuss the relationship between Thematic Integration and the Uniformity of Theta Assignment Hypothesis (UTAH).

5.7   Thematic Integration and UTAH

In chapter 4, I argued for a semantic composition principle that I called Thematic Integration. I repeat the definition of the principle in (180).

(180)   **Thematic Integration**

$$\overbrace{\text{H} \quad \text{DP}} \quad \rightarrow\text{Spell-Out}\rightarrow \quad R(e, DP).$$

The goal of this section is to argue that this principle is important if one wants to account for a principle like UTAH in the grammar (Baker 1988, 1997).

As discussed in chapter 4, the principle in (180) crucially relies on certain heads that I abstractly call y. It seems that a list of possible heads y may be needed in order to prevent overgeneration of the sort 'C(e, whP)' where there is a *wh*-phase at the left edge of the sentence. As an example, if the Agent is introduced as a sister to a Voice head, then (180) returns 'Agent(e, XP)'. This means that there has to be a rule that connects Voice and Agent. I will argue that Baker (1988, 1997)'s UTAH does this. The hypothesis is given in (181).

(181)   The Uniformity of Theta Assignment Hypothesis (UTAH)

Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure.

(Baker 1988: 46)

Among others, the hypothesis is intended to account for the contrast in (182)-(183), i.e. to account for why there seem to be no verbs where the Theme of the event is expressed as the subject.

(182)   John hit/built/found/pushed/bought/cleaned/broke/described the table.

(183)   *The table plit/puilt/vound/fushed/pought/bleaned/proke/tescribed.

(Baker 1997: 76)

Clearly there is a poverty of stimulus issue here: No child ever has access to such data as in (183), but nevertheless, no child acquires such a grammar. Instead the child will recognize that such structures are illicit despite no input telling them that they are bad.

Interestingly, Baker (1997: 120-121) states the following linking principles that give content to UTAH.[27]

(184) An agent is the specifier of the higher VP of a Larsonian structure.

(185) A theme is the specifier of the lower VP.

(186) A goal, path or location is the complement of the lower VP.

These principles cannot immediately be adopted in the present work, and they also, for natural reasons, do not incorporate the rich work on the syntax of argument structure that has been going on in recent years (Borer 2005a,b, Alexiadou et al. 2006, Pylkkänen 2008, Ramchand 2008). Nevertheless, similar rules can be formulated within the present approach. Since I assume that all arguments are sisters of dedicated functional projections, the rules would have to take the form sketched in (187)-(190), with an independent assumption about where in the tree these heads

---

[27]These rules can be stated in different ways. Levin and Rappaport Hovav (1995) suggest the rules in (i) and (ii).

  (i) *Immediate Cause Linking Rule*

       The argument of a verb that denotes the immediate cause of the eventuality described by that verb is its external argument (Levin and Rappaport Hovav 1995: 135).

  (ii) *Directed Change Linking Rule*

       The argument of a verb that corresponds to the entity undergoing the directed change described by that verb is its direct internal argument (Levin and Rappaport Hovav 1995: 136).

See also Larson (1988) for discussion.

sit.[28]

(187) An agent is the sister of a Voice head.

(188) A theme is the sister of a F head.

(189) A benefactive is the the sister of an Appl head

(190) A goal, path or location is the sister of a G head.

I have used Voice as a label since the literature agrees that the Agent is related to the Voice head (Kratzer 1996, Stechow 1996, Alexiadou et al. 2006, Pylkkänen 2008, Ramchand 2008, Alexiadou and Anagnostopoulou 2010) (see also Chomsky (1995c), Harley (1995). As for the other labels, I have used Appl for applicatives. There may be more than one applicative head (McGinnis 2001, Cuervo 2003, Jeong 2006, Pylkkänen 2008), and these various heads may require a different semantics such that the principle in (190) probably needs to be split into several rules. Since my goal is not to give an in depth study of applicatives and their semantics, I will not provide further discussion of that issue here. The main goal is rather to clarify the logic.

As for objects, I have just used an F projection. Marantz (2005), Alexiadou et al. (2006) argue that (change-of-state) verbs are syntactically decomposed into a Voice, a v and a root component as in (191) (see also Kratzer (2005)).

(191) [Voice [v [Root]]]

---

[28]This is similar to Epstein (2009) who argues that thematic assignments happen in a head-non-head relationship (what Epstein calls theta marking).

The v head introduces an event (cf. the *process* head in Ramchand (2008)). Furthermore, Alexiadou et al. (2006), Alexiadou and Anagnostopoulou (2010) argue that causative semantics emerge via the combination of v and a resultant state (a root or a small clause), cf. Embick (2004), Ramchand (2008), Schäfer (2008). This does not make v a plausible head for the theme to merge with. Therefore I am just going to suggest that there is a functional head F that merges with the theme; see Marantz (2005) for some further thoughts on what its semantics may be.

The rules in (187)-(190) would also derive thematic uniqueness, namely the fact that no verbs seem to be able to assign the same thematic role to two or more of its arguments Carlson (1984: 271).[29] The reason is that the mapping principle makes reference to the functional heads, and since each argument is related to one functional head, thematic uniqueness would follow. It would also make thematic uniqueness a principle of grammar and not a principle of eventualities as Carlson (1984: 273) argues. Furthermore, this way of looking at Thematic Integration does not necessitate that interpretation is 'delayed' in the sense argued by Hunter (2010: 71-72). Hunter argues that in order for an argument to be interpreted as either an external or an internal argument, interpretation needs to take place in a configuration where both arguments are present. This is not necessary once (180) is assumed instead of the type-shifting operation Hunter assumes.

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[29]This assumes that identical heads cannot iterate, which is related to the question of how the order of heads is ensured. See Cinque and Rizzi (2008), Shlonsky (2010) and van Gelderen (To appear) for discussion.

One may object to my use of specific thematic roles and not the more general labels External and Internal (cf. Williams (1981a), Pietroski (2005a), Hunter (2010) on the latter). For Williams, the external argument is a distinguished element that is singled out by underlining. Kratzer (1996: 131) claims that the notion of an external argument has no theoretical significance once arguments are severed from the verb. The reason is that, strictly speaking, the agent argument is no longer an argument of the verb. On my approach, the same can be said about the Theme argument. Kratzer also remarks that what we call the external argument of the verb is really the internal argument of Agent. Thus, even for Kratzer, all arguments are therefore internal, which is something that also holds of the view I am arguing in favor of. Belletti and Rizzi (1988) also argue that an internal/external distinction is not sufficient to capture Italian psychological predicates and Grimshaw (1990) argues that any given argument is 'more external' or 'less external' than another.

There is another related reason why I do not think it is profitable to use External and Internal. The reason is UTAH. If Baker's work is on the right track, then we need quite specific mapping principles between the syntax and SEM. As Baker (1997) argues, UTAH can be seen as part of the theory of the syntax-semantics interface. The following quote endorses exactly the same view as the one I am defending in this thesis.

(192)   If [the] kind of lexical decomposition approach begun by Hale and Keyser
        and brought into the syntax by Chomsky and others is correct, then the
        UTAH essentially disappears as a separate condition of grammar. The basic

function of the original UTAH was to regulate where the various arguments of a predicate are expressed. This is a nontrivial task if predicates have multiple arguments of the same type, because one must keep track of which NP is associated with which argument position. If, however, syntactic structure is built from the lexical decomposition of a verb, such that each predicate in the decomposition takes a single NP argument, then UTAH becomes trivial. All that remains is a simple convention that an argument must be in a local configuration with its argument-taker; the rest follows from compositional semantics. We have then reduced the UTAH to a matter of "virtual conceptual necessity" (Baker 1997: 125-126).

What Baker refers to as lexical decomposition (explicitly as in the work of Hale and Keyser (1993, 2002); though see also Dowty (1979) and Levin and Rappaport Hovav (1995)) of the verb is equivalent to the functional heads I am employing here. Given this, it seems difficult to use entirely general labels, as they do not seem to capture the relevant generalizations.

Lastly, notice that even if I argue that these mapping rules are necessary, this does not mean that I am putting 'Agent' and 'Theme' into the syntax, as I pointed out in chapter 4. Rather, the mapping rules give translations from the syntax and into the semantics. This may seem like a notational trick, but it is actually a significant difference because it keeps the syntax independent of the semantics. If we had put Agent and Theme into the syntax, then the syntax would in part be semantically driven, which is not a view I would like to endorse. Therefore I will

maintain that my approach is distinct from an approach that puts Agent and Theme as heads in the syntax.

5.8   Conclusions

In this chapter, I have argued that the theory presented in chapter 4 offers an avenue to account for the EPP in English. This is based on the claim that the EPP follows from conditions on linearization. I have also integrated my approach to the EPP in a larger theory of EPP-phenomena involving other Germanic and Romance languages. I then discussed how movement works on the present approach, and continues to deal with the fact that the present theory cannot derive CED effects in traditional ways, and I briefly suggested a way that one can do that. I also noted that the domain of application for an operation like Agree is smaller on the present approach than on most other approaches. I did not explore the cross-linguistic implications of this claim, but noted that theories like Distributed Morphology relegate most of these agreement facts to the PF component. Then I turned to serial verb constructions and argued that my theory of Spell-Out derives their logical forms straightforwardly. Lastly I discussed if the present approach can tell us something about UTAH and I argued that UTAH follows if one understands UTAH the way Baker (1997) suggests.

Chapter 6

Interfaces and Compositionality

6.1 Introduction

This chapter is more concerned with some fundamental issues than the previous

chapters. In particular, I want to discuss the issue of *transparency*. Concretely, what

does it mean for a mapping to be transparent? In order to begin to address this

question, it is necessary to consider the nature of the syntax-semantics interface.

This interface can be more or less transparent, and various mapping alternatives

have been presented in the literature.

Consider Higginbotham (1985)'s proposal. He provides rules that he calls

'basic principles of interpretation' (Higginbotham 1985: 590). These include four

principles involving the Theta Criterion and its implementation, rules for quantifiers

and quantifier scope, and lastly rules for antecedence and disjoint reference. Such

principles of interpretation relies on a very specific syntax, as Higginbotham makes

very clear, but there is no one to one correspondence between syntactic and semantic

rules. As such the mapping is not as transparent as it could be, but it is transparent,

say, for quantifier scope since the scopal relations depend on the syntactic structure

at LF.

In the next section I will discuss Jacobson (2002)'s perspectives on the syntax-

semantics interface. Jacobson frames this as an issue of compositionality, but one

can just as well view it as an issue of transparency and the nature of the mapping from one grammatical component to another component. Her discussion will be useful to see both the kind of mapping proposals that have been offered and to contrast them.

The chapter has the following outline. Section 6.2 discusses four different views of compositionality and compares them. It is argued that a system where each syntactic rule has a corresponding semantic rule cannot be sustained. Section 6.3 offers a few remarks on compositionality and discusses compositionality from the point of view of a conjunctive semantics. Section 6.4 elaborates on the basic semantic operations and briefly discusses whether they are specific to the human Faculty of Language. Section 6.5 concludes the chapter.

6.2   Four different views of compositionality

As I pointed out, there is a close relation between the syntax-semantics interface and compositionality. In what follows I will present Jacobson (2002)'s discussion of compositionality. The discussion is particularly relevant for how to think about the syntax-semantics interface, and it will form the background for my discussion of semantic composition operations below.

Jacobson (2002) discusses four views of compositionality. Her main goal is to defend the idea of direct compositionality, which is the idea that syntax and semantics work closely together when generating structures. She particularly argues against what has been the traditional view within Chomskyan generative syntax

since May (1977) (see also Chomsky (1976)), namely that there is a syntactic level of representation called Logical Form (LF) which serves as the input to 'semantics'. It is important to note, as she points out, what the specific nature of the objection is (emphasis mine):

(1)   'The objection to LF is not that it necessitates an additional 'level' - for a level is nothing more than a by-product of the rule system, and so it is the nature of the rule system which is (or should be) of primary interest. But indeed this view does entail a more complex rule system; the claim that there is a level of LF *(distinct from surface structures)* necessitates an additional set of rules mapping between surface structures and LF' (Jacobson 2002: 602).[1]

Both based on considerations of theoretical parsimony and from a more minimalist perspective, we want to reduce the theoretical machinery as much as possible, i.e., we want the rule system to be as simple and elegant as possible, provided that it still yields descriptive adequacy. LF was invented exactly for the latter reason, and if one wants to argue against it, one has to show how the same phenomena can be analyzed without it.

Jacobson also argues that the choice is not between LF and an architecture with a straightforward one-to-one mapping between syntax and semantics. There are other ways that one can maintain a notion of more or less direct compositionality while admitting differences between the syntactic and semantic composition, and

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[1]This is only an argument if SS exists, though Jacobson seems to have actual surface structures in mind, and not SS in the sense of GB theory.

Jacobson argues that all of these are superior to the LF analysis: 'Moreover, even if there is good evidence for a level of LF distinct from surface structure, there remain various ways to conceive of the organization of the grammar, and what I am calling the 'modern' solution is surely one of the more complex ways that has ever been dreamed up' (Jacobson 2002: 602). In the following subsections, we will see how she makes that argument, though it should be noted that the surface structure Jacobson is talking about is not the notion that we have had since the Extended Standard Theory. Rather, it is just the linear string. As we have learned from the history of generative grammar, is not obvious what surface structure is, and we certainly cannot assume that it is obvious what it is.

The following discussion will center around sentences of the form in (2).

(2)   Some man read every book.

Such ambiguous sentences, with a (universal) quantifier in object position, have been the subject of intense study for decades, and they also motivated the LF approach in May (1977). The sentence in (2) allows two possible readings: there is a particular man who read every book, or that every book was read by some man or other. We will use the sentence in (2) to briefly illustrate how each approach handles the ambiguity.

6.2.1   (A) Strong Direct Compositionality

This view is the strongest view that one can take concerning how syntax and semantics are related. Each syntactic rule has a corresponding semantic rule that

gives you the meaning of the relevant constituent as a function of its parts. This is typically known as the *rule-to-rule* principle and it originated with Montague (1970) (see also Bach (1976)). Szabó (2000: 484) articulates it this way:

(3) Compositionality is often formulated as the so-called *rule-to-rule* principle: Complex expressions can be assigned meaning by assigning meaning to the basic expressions and by giving a semantic parallel to the syntactic construction steps. The idea behind the rule-to-rule principle is that for each syntactic rule that specifies a way of combining certain sorts of expressions into a complex expression, there is a corresponding semantic rule which specifies a function that assigns to the meanings of the constituents the meaning of the complex expression we get when we apply the syntactic rule to them.

Jacobson assumes that the syntactic rules are of a context-free phrase structure type, which means according to her that the grammar does not have to keep track of structure - it merely concatenates strings (Jacobson 2002: 603). This view of compositionality requires one to use type-shifting rules fairly frequently. As Jacobson notes, this may not be too different from a theory that opens up the door for silent elements, since a silent lexical item that applies to the expression with which it combines is more or less equivalent to a type-shifting operation.

As for cases like (2) above, Jacobson discusses two alternatives. One involves 'Cooper storage' (Cooper 1975), which keeps the syntax simple by the relevant standards but enriches the semantics. Another view is to use type-shifting rules. A typical solution is to say that verbs like *read* are listed in the lexicon with the

type $< e, < e, t >>$, but that there is a type-shifting rule that allows an argument to lift to an $<< e, t >, t >$ type.[2] If you first lift the subject and then lift the object, then you get a wide-scope reading of the object. As we can see, on this approach, there is no 'mismatch' between the syntax and the semantics, though the semantic operations are very powerful since there are few if any limitations on what type-shifting can do.

6.2.2 (B) Weak(er) Direct Compositionality

What Jacobson calls 'weak(er) direct compositionality' is different from a strong direct compositionality in two ways. First, the combinatory syntactic rules are not all equivalent to a context-free phrase structure grammar. Instead they may perform some other operations. Second, syntactic rules may build structure and not just unstructured strings. Since this allows for the construction of trees, we are close to what Montague did and what was subsequently done in the mid and late 1970s. For Montague, linguistic expressions are first translated into a language of intensional logic, and only expressions of that language receive interpretation. This means that it is not the case that each of the syntactic operations is associated with a unique semantic operation, since there is this intermediate level. However, this can easily be changed such that you do not need the intermediate level, so Jacobson's point that Montague grammar is weakly directly compositional still stands.

The way to deal with cases like (2) also came from Montague, namely from

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[2] An alternative would be to say that transitive verbs map pairs of generalized quantifiers to truth values.

his 'Quantifying-In' rule. Jacobson (2002: 605-606) shows how this can be done formally, but these details are not important for present purposes. Suffice it to say that a quantifier in these cases binds a variable and that the linear order of quantifiers will determine the scope.

6.2.3 (C) Deep Compositionality

This is the model in Generative Semantics. In this theory, Deep Structure equals Logical Form, though generative semanticists did not care much about specifying interpretations the way semanticists usually do. However, as Jacobson says (Jacobson 2002: 606), this is easy enough to achieve. One can say that each tree is specified as well-formed by the syntactic rules and, at the same time, each tree is given a model-theoretic interpretation by the semantic parts of the rules. It is important to note the following property of deep compositionality: 'A key difference between this and Strong Direct Compositionality is that this view contains an additional set of transformational rules which map the Logical Forms to surface structures' (Jacobson 2002: 606).

As for data such as (2), the treatment of these is quite different from what we have seen so far. There is a level where the quantifiers are represented: They are in their raised position corresponding to their interpretation, rather than in their surface position that corresponds to where they are pronounced. Quantifier Lowering takes care of the discrepancy, which means that whenever a quantifier appears in object position, this appearance is due to Quantifier Lowering. The

ambiguity follows from the initial height of the quantified NPs, since this is where they are assigned an interpretation.

6.2.4   (D) Surface to LF

The last view Jacobson discusses is what has come the most prominent view within Chomskyan generative grammar, namely '[...] the view that there is a level of LF which receives a model-theoretic interpretation and which is derived from surface structures by some set of rules' (Jacobson 2002: 607). Jacobson correctly points out that there are two possible versions of this view. The first one is that the compositional syntactic rules directly give surface structure and these are then mapped into LFs. The second one is the more familiar one, where the surface structures are derived from an underlying structure. An argument in favor of this architecture that is often put forward is that the overt and covert transformations are very similar, though, crucially, there can be differences between the two types of transformations. I will return to this point below when I consider empirical arguments for the existence of such differences.

When it comes to dealing with quantifier ambiguities as in (2), the analysis is pretty much like a reversed version of the analysis in Generative Semantics. That is, the quantified material is located roughly in situ at surface structure (except for movement to subject position for EPP reasons), and then at LF there will be movements to generate the correct scope relations. The syntactic component works independently of the interpretational component in the sense that a syntactic surface

structure representation is generated, then a syntactic LF representation, and then the interpretational rules work on the latter representation.

6.2.5   Comparison and discussion

Jacobson (2002) stresses that there is a substantial difference between the first three approaches to compositionality (A-C) and the last one (D): 'A, B, and C all have in common the fact that the syntax 'builds' in conjunction with the model-theoretic interpretation, and this is discarded in D' (Jacobson 2002: 609). One could view this as problematic for aesthetic reasons, as Jacobson also does: a system where syntax and semantics run in tandem – in the sense that semantic composition tracks syntactic composition, as if expressions had their meanings intrinsically – is more elegant than a system where they do not. However, what Jacobson fails to mention is that you could formulate a rule that gives a semantic value to the syntactic transformation. The semantic value could be vacuous, though it would still constitute a semantic value. If so, then the correlation between syntactic and semantic rules would be reinstated. However, Jacobson has two other objections that this solution does not answer: 'The first [objection] is that under the conception in D there is no explanation as to *why* these systems work on such similar objects, and the second (related) problem is that D requires a duplication of information not required in A-C' (Jacobson 2002: 609). I find the first objection particularly important.[3] If the syntactic and semantic rules are roughly the same, namely concatenative with

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[3]The second objection does not seem convincing. Approaches A and B surely duplicate information by having predicates with an infinite hierarchy of types via lifting.

something added to get you hierarchy and thematic closure, as suggested in Hornstein and Pietroski (2009), then we really need strong empirical evidence to bolster the claim that a level of LF is necessary. Otherwise the natural conclusion should be that syntax and semantics dovetail rather closely.

Jacobson elaborates on the latter objection concerning duplication of information in the following way:

(4) 'Moreover, there is a clear cost to the move of divorcing the syntactic combinatory rules from the semantic rules. The point is easiest to illustrate by a comparison of theory C to theory D, since these are otherwise most alike. Both theories contain an additional set of rules effecting a mapping between surface structure and LF; they disagree on the direction of the mapping. Crucially, in theory D, the semantic combinatory rules (or their equivalents), and this means that the syntactic side of things must be stated twice: once as output of the syntax, and once as input to the semantics' (Jacobson 2002: 610).

Of course, there is a way to show that we in fact need duplication. Jacobson clearly states how such an argument would have to run:

(5) 'The claim that these rules operate on different objects could also be substantiated if one could show that the semantic rules took as their input a much larger or more general set of local trees than the syntactic rules give as output. If one could really make such a case, then divorcing the output of the syntax from the input to the semantics would be exactly the right move,

but to my knowledge, there have been no serious arguments to this effect'
(Jacobson 2002: 611).

In the last sentence, I think Jacobson ignores in particular one argument advanced by Huang (1982) which seriously challenges her claims.

Huang (1982) discussed a striking set of data from Chinese *wh*-movement and compared them to English. Consider the contrast between (6) and (7) (from (Huang et al. 2009: 266)).

(6)   *What₁ do you like [the man who fixed t₁]

(7)   ni   zui   xihuan [mai shenme de ren]?
      you must like   buy what   DE person
      'What do you like the person who bought t?'

(6) shows a standard case of a Subjacency violation. Since (7) is good, one may be lead to think that Subjacency does not apply in Chinese. However, that conclusion is not warranted. Lasnik and Uriagereka (1988: 107) present the following data.

(8)   Who [t believes [the claim [that [Mary read what]]]]

(9)   ?*What [do you believe [the claim [that [Mary read t]]]]

Under the assumption that all *wh*-phrases need to move to Comp at LF, () requires the same exception from Subjacency that Chinese requires. Rather, what seems to be going on is that there is a difference between syntactic movement and LF movement.

Further support for this view comes from the fact that even though arguments do not seem to obey Subjacency in Chinese, adjuncts do (Huang et al. 2009: 263):

(10) *ni zui   xihuan [weishenme mai shu   de ren]?
      you most like   why   buy book DE person
      'Why do you like [the person who bought the books t]?'

Huang (1982) argued in favor of the following: complements can move freely at LF, non-complements cannot. A non-complement is constrained by the Empty Category Principle (ECP).

The following example in (11) shows that adjuncts can move in Chinese without incurring an ECP violation because the trace is antecedent-governed, assuming the LF-representation in (11), using English words for ease of exposition.

(11) [Why$_1$]$_1$ Mary thinks [t$_1$ [John [left] t$_1$]]

This derivation assumes contra Aoun et al. (1981) that comp-to-comp movement at LF is possible.

Jacobson (2002) does not discuss these facts much. Here is what she has to say about them:

(12) 'It has also become popular to talk of the difference between *wh*-movement constructions (English) and quantifier scopes (or the difference between *wh*-movement in English and in Chinese – see Huang, 1982) as reducing to a difference between 'overt' and 'covert' movement. But - aside from the fact that this makes for a pleasant rhyme - it doesn't seem to be any more illuminating than saying that the difference is between appending to the front and substituting in (as in the classical Montague treatments) or between moving up and moving down (as in classical Generative Semantics)' (Jacobson 2002: 615-616).

I think the above discussion has shown that the data show more than Jacobson takes them to show. Therefore I think there is still a good case to be made for divorcing syntactic and semantic operations. There are too many syntactic operations that do not have a corresponding semantic effect, e.g., movement, although movement per se is not incompatible with one kind of direct compositionality, as Barker and Jacobson (2007) emphasize. If we consider both Huang's argument and scope interactions, then we have very powerful arguments that there are interactions here that exclude otherwise puzzling absences of ambiguities. Taken together with the evidence provided by Huang, it is clear that there is no one-to-one correspondence between syntactic and semantic rules.

If this is correct, we have to ask what the constraints are on the mapping. That such constraints exist has been clear since May (1977)'s influential work, and has been developed by Huang and others. Montague (1974b)'s approach is too liberal, in that there are not enough constraints on the mapping principles. Jacobson's own favorite approach is constrained, but as we have seen, there are empirical problems with it. This thesis has suggested strict mapping principles, where there are limitations on the size of the syntactic domains that are transferred to logical form. The other constraints will be syntactic in nature, cf. May (1977) and Hornstein (1995a,b) for illustrative examples.

The theory in this dissertation supports this latter conclusion. The Spell-Out domains are divorced from the purely syntactic operations, and hence there is no one-to-one correspondence between the syntactic rules and the 'semantic' rules. The latter have been argued to include conjunction, thematic integration and existential

closure. However, the reader may be curious to know how these operations fit into a compositional theory. I will therefore say a bit more about this before I return to some discussion of the nature of these operations.

6.3   A few remarks on compositionality

We have seen how discussion of the interface between syntax and semantics provides us with some perspectives on transparency. The mapping can be less or more transparent. This will in turn have consequences for how compositionality works.

Bayer (1996) argues that the neo-Davidsonian approach comes in two flavors: One flavor is a lexical flavor, where the denotation of the verb contains slots for thematic predicates (Bayer 19964):

(13)   chase = $\lambda y \lambda x \lambda e[\text{chase'}(e) \wedge \theta_{SU,chase'}(x)(e) \wedge \theta_{DO,chase'}(y)(e)]$

Bayer calls this approach the lexical strategy. The other flavor is what Bayer calls the compositional approach. On this approach, the meaning of a verb is a set of events.

(14)   chase = $\lambda e[\text{chase'}(e)]$

As Bayer points out, on this approach, thematic roles are linked to the verbal meanings with the events that correspond to the meaning of the verb. The approach I am pursuing is clearly of this second type.

Several researchers have objected to me that compositionality necessarily involves lambdas. If the computation is not type-driven by way of lambdas, the computation is not compositional. There are several things that are wrong with

this claim.

First, lambdas just stand for functions. As Collins (2011: 43) puts it, 'The original function and its λ-abstraction are equivalent as so interpreted, as the abstraction simply names the function that interprets the original predicate (open sentence) as defined in M[odel], where any occurrence of a variable is replaced by what the function f takes as its argument'. So lambdas per se should not be required given that this is all they do. And as Champollion (2010b,c) has shown, one can generate the same interpretation as above by way of a type-driven computation where functional heads introduce arguments. This should not come as a surprise: a powerful tool such as the lambda-calculus can clearly do the same as a less powerful tool.

Second, it is important to be clear on what compositionality amounts to. Here is a standard definition: 'Compositionality is a property that a language may have and may lack, namely the property that the meaning of any complex expression is *determined* by the meanings of its parts and the way they are put together' (Pagin and Westerståhl 2010a: 250). There are several issues to bring out here: One is that compositionality is not a given - it could very well be that natural language is not compositional, as e.g., Fodor (2001) claims.[4] Another is that we need a definition of what meaning is - how are meanings composed should be an important question.

As Szabó (2000) has made very clear, there are many different flavors of compositionality. For our purposes, we care about how an abstract notion of composi-

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[4]See Pagin and Westerståhl (2010b) for a discussion of common objections to compositionality.

tionality is *realized* in natural cases, i.e., in cases involving natural language data. One answer could be Functional Application. Another answer could be Conjunction. For both these alternatives, it is important that the mapping be systematic. Thus we might worry more about *systematicity* rather than compositionality when it comes to natural language.[5] The rules that relate the parts to the whole have to be systematic. As Hornstein (1995b: 386) argues, 'That this systematicity is not as strictly compositional as it might be does not imply that it fails to account for the productive capacity displayed by native speakers'. This argument gets even stronger if it is the case that language is not really compositional, because even if language isn't compositional, it surely is systematic. My approach involves a mapping that is both systematic and compositional: for each Spell-Out domain, there is a conjunct. And each conjunct is related to the whole sentential logical form, which is closed by an existential quantifier.

The real questions involve the nature of the basic operations that the systematic mapping invokes. These basic operations can have different complexities. One can imagine a syntax that is as rich and as complex as possible and that any kind of semantic composition operations are allowed. That will provide an enormously powerful theory, which coupled with the availability of silent structure, pretty much can do whatever one wants it to do. This means that it will be hard to justify why only a few of these options are exploited in natural language. Furthermore, it will make it very hard to come up with a transparent mapping from syntax to semantics.

[5]See also Blutner et al. (2004) for an empirical argument that systematicity is superior to compositionality.

Consider a question related to this, which relates to the necessity for constraints on the semantic side.

Why are there only some semantic types? There is no known theory of how to restrict or explain the type typology that we find. Even the motivation for why we have the basic types $\langle e \rangle$ and $\langle t \rangle$ is not very clear, as Partee (2006) points out. She concedes that it is in part because of tradition and in part because it has worked so well. As she also points out, whereas the model-theoretic domain corresponding to type $\langle e \rangle$ has been fairly uncontroversial, there has been more disagreement when it comes to type $\langle t \rangle$. Partee lists the following suggestions: truth-values, sets of assignment function, functions from possible worlds to truth-values and propositions taken as primitives. In a sense, Montague had a third basic type, namely possible worlds, and there have also been proposals to add more basic types: situations or eventualities and sometimes times. As Partee points out: 'Arguments for or against various choices have usually been arguments from elegance of resulting analyses, not arguments claiming conceptual necessity'. If we want a transparent mapping, we want to reduce the power of the semantic operations, and reduce the discrepancy between syntactic composition and semantic composition. Questioning the necessity for a type typology might be relevant from this perspective.

The second possibility is that syntax is simpler but that the semantics as complex as one likes. From the point of transparency, it is not trivial how one maps a simple syntax onto a complex semantics. Semantics seem to require hierarchical and binary trees, and also quite a bit of movement-like relations. How will a syntax that is very simple (e.g., non-hierarchical) provide the right input to the semantics?

Clearly, there will have to be a lot of generative power on the semantics side in order to remedy such missing syntactic structure. Put differently, semantics will have to do things that a more complex syntax could have done.

One can of course turn the previous picture on its head, which gives us the third possibility, namely a complex syntax and a simple semantics. In principle, a complex syntax allows for as much silent structure as one wants, which again constitutes a case where it is hard to properly constrain the theory.[6] In many ways, this view corresponds to the view that generative semanticists held (see Lakoff (1972), McCawley (1973), cf. also Harman (1972)), although they rarely spelled out the semantic interpretations, as discussed above. A complexity discrepancy is crying out for 'adjustment' rules, it seems, and they in turn require explanation. And as before, discrepancies don't yield transparency.

Lastly, the fourth option is to make both syntax and semantics as simple as possible. Based on what I have said so far, this clearly comes out as the ideal alternative. If one can make both syntax and semantics simple, this makes it somewhat easier to give principled explanations for why these operations exist and how they may have come into existence evolutionarily speaking.[7] Put differently, we need to attribute less to Universal Grammar, which is preferable for the reasons just given (cf. Chomsky (2005), Richards (2008), Hornstein (2009), Boeckx (2011)).

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[6]It should be noted that it is hard to tell apart semantic operators that are stipulated to exist only in the semantics from those that are present as silent operators in the syntax.

[7]Crucially the syntax cannot be too simple, as in Quine (1960) and Davidson (1967), where there is really no notion of a hierarchical syntax.

Interestingly, if both syntax and semantics are simple, then arguably the mapping from syntax to semantics will be simple too, maybe close to Montague's "rule-to-rule" hypothesis where a syntactic rule corresponds to a semantic rule (see also Epstein et al. (1998), Barker and Jacobson (2007)), as we discussed above. Complex semantic operations will not be needed to remedy the simplicity of syntax if it can be argued that the semantic operations themselves are simple. A major goal of the present thesis is to argue that one can get a transparent mapping from syntax to semantics by simplifying both components appropriately (see also Hornstein (1984) for a somewhat similar claim). So by independently simplifying syntax and semantics, the mapping between them also gets simplified. There will of course be a limit to how much simplification one can do, and I have no advocated a rule-by-rule hypothesis in this dissertation.

I have argued for a simple syntax and semantics, but it has suggested mapping principles that are non-trivial. These mapping principles appear at first glance to be more complex than a point-by-point mapping, since they require a delay in some cases in order to generate the appropriate Spell-Out domain. Despite this, I have tried to make the case that eliminating specifiers and verbal adicity makes it possible to develop a more restricted theory of the syntax, the semantics and the syntax-semantics interface.

I will now return to the basic operations I have posited and discuss their nature in some more detail.

6.4 Basic operations

In chapter 4 I discussed the three basic semantic operations that I assume. For ease of reference, I list them in (15)-(17).

(15) Conjunction

(16) Thematic Integration

(17) Existential Closure

It is important to emphasize the relative simplicity of these operations. They are all fairly general operations, and one can even ask if they are language-specific operations. Conjunction is a very general rule, which just chains two things together without changing any of their properties. Existential Closure is a very general property of logic and presumably even other non-human species make use of. Evidence for this may be that they have thoughts or instincts that refer to specific objects, e.g., in the case of identifying a prey. As for Thematic Integration, this is not really a semantic operation on my approach. It has a semantic effect, but it is clearly a syntactic rule related to how Spell-Out works.

It should be noted that conjunction encompasses a very general principle that can easily be adopted by Neo-Montagovians. A priori, it would be desirable to have just one compositional operation, be it conjunction or functional application. Montague's algebraic conception of semantics require that the syntactic operation of concatenation corresponds to a single semantic operation. This has typically been taken to be functional application. Conjunctivism allows Neo-Montagovians to treat instances of predicate modification as another instance of a general oper-

ation of concatenation, which could be driven by lambda functions if so desired. Pietroski (2005a) has argued that this is not desirable on either theoretical or empirical grounds, but my point here is simply to point at the similarity across meta-theoretical frameworks. For any theorist, it should be desirable to stipulate as few operations as possible.[8]

One question that arises is what this separate faculty might be. Several researchers have made the case for a faculty of logic. Chomsky (1988: 99) argues:

(18)   The logical notions are embedded in our deepest nature, in the very form of our language and thought, which is presumably why we can understand some kinds of logical systems quite readily whereas others are inaccessible to us without considerable effort [...] if at all.

A similar point has been made by Luria (1973: 141):

(19)   To the biologist it makes eminent sense to think that, as for language structure, so also for logical structures, there exist in the brain network some patterns of connections that are genetically determined and have been selected by evolution as effective instruments for dealing with the events of life.

For further arguments to this effect, see Crain and Pietroski (2001), Pietroski and Crain (2005) and especially Crain and Khlentzos (2010) for acquisition experiments that argue in favor of innate knowledge of logic. In the future, it would be interesting

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[8]In addition to these operations, quantification over sequence variants may be required for purposes of quantification and relative clauses, cf. Larson and Segal (1995), Pietroski (2011).

to explore these issues further.[9]

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[9]Nowhere in this thesis have truth and reference played a significant role. This is not just because I have not been specific about this issue, but because I do not think that these notions should play a significant role in an I-language approach. This aligns well with the Chomskyan approach. Several researchers have presented many arguments in favor of a purely internalistic approach that does not make use of reference and truth, cf. Chomsky (1977, 1995b, 2000b), Horwich (1997, 1998), McGilvray (1998), Pietroski (2005b, Forthcoming), Patterson (2009). In a forthcoming book, McGilvray outlines this view in more detail:

(i)   I mentioned before that one can introduce a technical term, call it 'referM' or something of that order (with indices for contextual variables or not), to indicate a relationship that is stipulated to stand between a word and a thing. This can be a useful tool in doing formal semantics and model theory. In such a case, however, the aim is not to somehow capture what is going on when a person on an occasion actually refers to something, but rather the aim is to create a mental model in which a term stands in the specified relationship to a specified thing or things, perhaps in some (also stipulated) possible world. This can be useful in trying to make sense of inference and entailment, among other things - or at least, it has proven so. But it must be kept in mind that in stipulating such a relationship and the 'things' that terms referM to, the things and circumstances in the model and the model as a whole are all mental inventions and are inside the head; they are not things 'out there'. In effect, then, introducing mental models of this sort is an exercise in syntax. It can be justified, but not as a way of capturing reference and truth (appropriateness, etc) as these notions arise in the use of language (McGilvray In press: chapter 4).

There is a lot of work to be done in order to develop this view in great detail, and I hope to return to that in future work.

6.5 Conclusions

This chapter has argued that we need to divorce syntactic composition from semantic composition and that a conjunctivist semantics is compositional in many ways. I also argued that rather than worrying about compositionality when it comes to the Faculty of Language, we should rather worry about systematicity and what the right systematic composition rules are. The chapter also elaborates on the basic semantic operations and discusses whether they are specific to the human Faculty of Language.

Chapter 7

Conclusions

The goal of this dissertation has been to unify two reductionist hypothesis: that syntax does not distinguish between specifiers and complements, and that verbs do not take thematic arguments. I have argued that these two hypotheses actually bear on each other and that we get a better theory if we pursue both of them. The hypothesis that each application of Spell-Out corresponds to a conjunct at logical form has been put forth, which transparently maps syntactic structures onto logical forms. Extensive discussion has been provided of the problematic nature of both specifiers and of verbs taking thematic arguments. Several syntactic consequences of the proposal have been outlined and discussed, and I have emphasized the need for reanalyzing many facts involving areas such as movement, linearization, serial verbs, extraction and so on and so forth. Lastly the thesis offers a specific view of compositionality and basic semantic operations from a conjunctivist perspective.

If the arguments in the present thesis are on the right track, there are several areas of semantic and syntactic theory that would have to be reanalyzed in order to fit into the theory that I have put forward. Examples that come to mind are: nominal phrases, polysynthesis, crossover effects etc. Whether the theory can be sustained is in part a question of how successful these reanalyses turn out to be. I have dealt with the most obvious challenges that come to mind in chapters 4 and 5,

but needless to say, there are many other empirical nuts and bolts that will have to be dealt with. One domain that I have not discussed here for reasons of space, is the syntax and semantics of interrogatives, though see Lohndal and Pietroski (2011) for comprehensive discussion within the present framework. Clearly others remain, and only future work can tell us whether the views in the present thesis can be sustained or not.

Bibliography

Abels, Klaus. 2008. Towards a restrictive theory of (remnant) movement. *Linguistic Variation Yearbook* 7:52–120.

Abney, S. 1987. The English noun phrase in its sentential aspect. Doctoral Dissertation, MIT.

Adger, David. 2003. *Core Syntax*. Oxford: Oxford University Press.

Adger, David. In press. *A Syntax of Substance*. Cambridge, MA: MIT Press.

Adger, David, Bernadette Plunkett, George Tsoulas, and Susan Pintzuk. 1999. Specifiers in Generative Grammar. In *Specifiers: Minimalist Approaches*, ed. David Adger, Susan Pintzuk, Bernadette Plunkett, and George Tsoulas, 1–18. Oxford: Oxford University Press.

Adger, David, and Peter Svenonius. 2011. Features in Minimalist Syntax. In *The Oxford Handbook of Linguistic Minimalism*, ed. Cedric Boeckx, 27–51. Oxford: Oxford University Press.

Åfarli, Tor A. 1992. *The Syntax of Norwegian Passive Constructions*. Amsterdam: John Benjamins.

Åfarli, Tor A. 1995. A note on the syntax of adverbial phrases. *Norsk Lingvistisk Tidsskrift* 13:23–40.

Åfarli, Tor A. 2007. Do verbs have argument structure? In *Argument Structure*, ed.

Eric Reuland, Tanmoy Bhattacharya, and Giorgos Spathas, 1–16. Amsterdam: John Benjamins.

Alexiadou, Artemis. 1997. *Adverb Placement: A Case Study in Antisymmetric Syntax*. Amsterdam: John Benjamins.

Alexiadou, Artemis, and Elena Anagnostopoulou. 1998. Parametrizing Agr: Word Order, Verb-Movement and EPP-Checking. *Natural Language & Linguistic Theory* 16:491–539.

Alexiadou, Artemis, and Elena Anagnostopoulou. 2001. The Subject-in-Situ Generalization and the Role of Case in Driving Computations. *Linguistic Inquiry* 32:193–231.

Alexiadou, Artemis, and Elena Anagnostopoulou. 2007. The Subject-in-Situ Generalization Revisited. In *Interfaces + Recursion = Language?*, ed. Hans-Martin Gärtner and Uli Sauerland, 31–60. Berlin: Mouton de Gruyter.

Alexiadou, Artemis, and Elena Anagnostopoulou. 2010. Dative-Nominative Alternations. Talk given at CGSW25 Tromsø, June 11.

Alexiadou, Artemis, Elena Anagnostopoulou, and Florian Schäfer. 2006. The properties of anticausatives crosslinguistically. In *Phases of Interpretation*, ed. Mara Frascarelli, 187–211. Berlin: Mouton de Gruyter.

Alexiadou, Artemis, Elena Anagnostopoulou, and Florian Schäfer. In Progress. *External Arguments in Transitivity Alternations: A Layering Approach*. Oxford: Oxford University Press.

Alexiadou, Artemis, and Terje Lohndal. 2011. The Syntax and Semantics of Roots. Ms., University of Stuttgart and University of Maryland.

Alexiadou, Artemis, and Florian Schäfer. 2010. There-insertion and the unaccusativity hypothesis. Talk given at GLOW Asia VIII, August.

Aoun, Joseph, Norbert Hornstein, and Dominique Sportiche. 1981. Some aspects of wide scope quantification. *Journal of Linguistic Research* 1:69–95.

Arad, Maya. 2003. Locality Constraints on the Interpretation of Roots: The Case of Hebrew Denominal Verbs. *Natural Language & Linguistic Theory* 21:737–778.

Arad, Maya. 2006. The Spray-Load Alternation. In *The Blackwell Companion to Syntax*, ed. Martin Everaert and Henk van Riemsdijk, 466–478. Malden, MA: Blackwell.

Bach, Emmon. 1976. An extension of classical transformational grammar. In *Problems in Linguistic Metatheory*, 183–224. Department of Linguistics, Michigan State University.

Bach, Emmonh. 1981. On Time, Tense, and Aspect: An Essay in English Metaphysics. In *Radical Pragmatic*, ed. Peter Cole, 63–81. New York: Academic Press.

Baker, Mark C. 1988. *Incorporation*. Chicago: University of Chicago Press.

Baker, Mark C. 1997. Thematic Roles and Syntactic Structures. In *Elements of Grammar*, ed. Liliane Haegeman, 73–137. Dordrecht: Kluwer.

Baker, Mark C. 2003. *Lexical Categories: Verbs, Nouns, and Adjectives*. Cambridge: Cambridge University Press.

Baker, Mark C., and Osamuyimen T. Stewart. 1999. On Double-Headedness and the Anatomy of the Clause. Ms., Rutgers University.

Baker, Mark C., and Osamuyimen T. Stewart. 2002. A Serial Verb Construction Without Constructions. Ms., Rutgers University.

Baltin, Mark. 1982. A Landing-site Theory of Movement Rules. *Linguistic Inquiry* 13:1–38.

Baltin, Mark. 1989. Heads and projections. In *Alternative Conceptions of Phrase Structure*, ed. Mark Baltin and Anthony S. Kroch, 1–16. Chicago: University of Chicago Press.

Barker, Chris. 1998. Episodic-ee in English: A Thematic Role Constraint on New Word Formation. *Language* 74:695–727.

Barker, Chris, and Pauline Jacobson. 2007. Introduction: Direct Compositionality. In *Direct Compositionality*, ed. Chris Barker and Pauline Jacobson, 1–19. Oxford: Oxford University Press.

Bartsch, Renate. 1976. *The Grammar of Adverbials*. Amsterdam: North-Holland.

Bayer, Samuel Louis. 1996. Confession of a Lapsed Neo-Davidsonian. Doctoral Dissertation, Brown University.

Belletti, Adriana, and Luigi Rizzi. 1988. Psych-verbs and theta-theory. *Natural Language & Linguistic Theory* 6:291–352.

den Besten, Hans. 1983. On the interaction of root transformations and lexical deletive rules. In *On the Formal Syntax of the Westgermania*, ed. Werner Abraham, 47–131. Amsterdam: John Benjamins.

Bever, Thomas G. 2009. Remarks on the Individual Basis for Linguistic Structures. In *Of Minds and Language: A Dialogue with Noam Chomsky in the Basque Country*, ed. Massimo Piattelli-Palmarini, Juan Uriagereka, and Pello Salaburu, 278–298. Oxford: Oxford University Press.

Blutner, Reinhard, Petra Hendriks, Helen de Hoop, and Oren Schwarz. 2004. When Compositionality Fails to Predict Systematicity. In *Compositional Connectionism in Cognitive Science. Papers from the AAAI Fall Symposium*, ed. Simon D. Levy and Ross Gayler, 6–11. Arlington: The AAAI Press.

Bobaljik, Jonathan David. 2008. Where's Phi? Agreement as a Post-Syntactic Operation. In *Phi-Theory: Phi Features across Modules and Interfaces*, ed. Daniel Harbour, David Adger, and Susana Béjar, 295–328. Oxford: Oxford University Press.

Bobaljik, Jonathan David, and Dianne Jonas. 1996. Subject Positions and the Roles of TP. *Linguistic Inquiry* 27:195–236.

Boeckx, Cedric. 2000. EPP eliminated. Ms., University of Connecticut.

Boeckx, Cedric. 2006. *Linguistic Minimalism*. Oxford: Oxford University Press.

Boeckx, Cedric. 2008. *Bare Syntax*. Oxford: Oxford University Press.

Boeckx, Cedric. 2009. On Long-Distance Agree. *IBERIA* 1:1–32.

Boeckx, Cedric. 2010. Defeating Lexicocentrism: Part A of Elementary Syntactic Structures. Ms., ICREA/UAB.

Boeckx, Cedric. 2011. Approaching parameters from below. In *Biolinguistic approaches to language evolution & variation*, ed. Anna Maria Di Sciullo and Cedric Boeckx, 205–221. Oxford: OUP.

Borer, Hagit. 2005a. *Structuring Sense: In Name Only*. Oxford: Oxford University Press.

Borer, Hagit. 2005b. *Structuring Sense: The Normal Course of Events*. Oxford: Oxford University Press.

Borer, Hagit. 2009. Categorizing Roots. Talk given at the Roots workshop, University of Stuttgart, June 12.

Bošković, Željko. 1997. *The Syntax of Nonfinite Complementation: An Economy Approach*. Cambridge, MA: MIT Press.

Bošković, Željko. 2002. A-movement and the EPP. *Syntax* 5:167–218.

Bošković, Željko, and Howard Lasnik. 2003. On the distribution of null complementizers. *Linguistic Inquiry* 34:527–546.

Bowers, John. 2002. Transitivity. *Linguistic Inquiry* 33:183–224.

Bowers, John. 2010. *Arguments as Relations*. Cambridge, MA: MIT Press.

Brasoveanu, Adrian. 2010. Modified Numerals as Post-suppositions. In *Logic, Language and Meaning, Lecture Notes in Computer Science*, ed. Maria Aloni, Harald Bastiaanse, Tikitu de Jager, and Katrin Schulz, 203–212. Berlin: Springer.

Bresnan, Joan. 1972. Theory of Complementation in English. Doctoral Dissertation, MIT.

Bresnan, Joan. 1982. The Passive in Lexical Theory. In *The Mental Representation of Grammatical Relations*, ed. Joan Bresnan. Cambridge, MA: MIT Press.

Brody, Michael. 2006. 'Move' in syntax: Logicaly necessary or undefinable in the best case? *Lingua* 116:1553–1560.

Bruening, Benjamin. 2010. Ditransitive Asymmetries and a Theory of Idiom Formation. *Linguistic Inquiry* 41:519–562.

Cable, Seth. 2010. The Optionality of EPP in Dholuo. Talk given at NELS 41, October.

Carlson, Greg. 1984. Thematic roles and their role in semantic interpretation. *Linguistics* 22:259–279.

Castañeda, Hector-Neri. 1967. Comments. In *The Logic of Decision and Action*, ed. Nicolas Resher, 104–112. Pittsburgh: University of Pittsburgh Press.

Castillo, Juan Carlos, John E. Drury, and Kleanthes K. Grohmann. 1999. Merge over

Move and the Extended Projection Principle. *University of Maryland Working Papers in Linguistics* 8:63–103.

Castillo, Juan Carlos, John E. Drury, and Kleanthes K. Grohmann. 2009. Merge over Move and the Extended Projection Principle: MOM and the EPP Revisited. *Iberia* 1:53–114.

Chametzky, Robert A. 2000. *Phrase Structure: From GB to Minimalism*. Malden, MA: Blackwell.

Champollion, Lucas. 2010a. Cumulative readings of *every* do not provide evidence for events and thematic roles. In *Logic, Language and Meaning, Lecture Notes in Computer Science*, ed. Maria Aloni, Harald Bastiaanse, Tikitu de Jager, and Katrin Schulz, 213–222. Berlin: Springer.

Champollion, Lucas. 2010b. Parts of a whole: Distributivity as a bridge between aspect and measurement. Doctoral Dissertation, University of Pennsylvania.

Champollion, Lucas. 2010c. Quantification in event semantics. Talk given at the 6th International Symposium of Cognition, Logic and Communication.

Chomsky, Noam. 1955. The Logical Structure of Linguistic Theory. Ms., Harvard University and MIT. [Revised version published in part by Plenum, New York, 1975].

Chomsky, Noam. 1957. *Syntactic structures*. The Hague: Mouton.

Chomsky, Noam. 1965. *Aspects of the Theory of Syntax*. Cambridge, MA: MIT Press.

Chomsky, Noam. 1970. Remarks on nominalization. In *Readings in English transformational grammar*, ed. R. Jacobs and P. Rosenbaum, 184–221. Waltham, MA: Ginn.

Chomsky, Noam. 1973. Conditions on transformations. In *A festschrift for Morris Halle*, ed. Stephen R. Anderson and Paul Kiparsky, 232–286. New York: Holt, Rinehart, & Winston.

Chomsky, Noam. 1976. Conditions on Rules of Grammar. *Linguistic Analysis* 2:303–351.

Chomsky, Noam. 1977. *Essays on Form and Interpretation*. New York: North Holland.

Chomsky, Noam. 1981. *Lectures on Government & Binding: The Pisa Lectures*. Dordrecht: Foris.

Chomsky, Noam. 1982. *Some Concepts and Consequences of the Theory of Government and Binding*. Cambridge, MA: MIT Press.

Chomsky, Noam. 1986a. *Barriers*. Cambridge, MA: MIT Press.

Chomsky, Noam. 1986b. *Knowledge of Language*. New York: Praeger.

Chomsky, Noam. 1988. *Languag and the Problems of Knowledge: The Managua Lectures*. Cambridge, MA: MIT Press.

Chomsky, Noam. 1989. A generalization of X-bar theory. In *Studia Linguistica et Orientalia Memoria Haim Blanc Dedicata*, ed. P. Wexler, A. Borg, and S. Somekh, 86–93. Wiesbaden: Otto Harrassowitz.

Chomsky, Noam. 1991. Some Notes on the Economy of Derivation and Representation. In *Principles and Parameters in Comparative Grammar*, ed. Robert Freidin, 417–454. Cambridge, MA: MIT Press.

Chomsky, Noam. 1993. *Language and Thought*. Wakefield, RI: Moyer Bell.

Chomsky, Noam. 1995a. Bare Phrase Structure. In *Evolution & Revolution in Linguistic Theory: A Festschrift in Honor of Carlos Otero*, ed. Héctor Campos and Paula Kempchinsky, 51–109. Washington, D.C.: Georgetown University Press.

Chomsky, Noam. 1995b. Language and Nature. *Mind* 104:1–61.

Chomsky, Noam. 1995c. *The Minimalist Program*. Cambridge, MA: MIT Press.

Chomsky, Noam. 2000a. Minimalist Inquiries: The Framework. In *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, ed. Roger Martin, David Michaels, and Juan Uriagereka, 89–155. Cambridge, MA: MIT Press.

Chomsky, Noam. 2000b. *New Horizons in the Study of Language and Mind*. Cambridge: Cambridge University Press.

Chomsky, Noam. 2001. Derivation by Phase. In *Ken Hale: A Life in Language*, ed. Michael Kenstowicz, 1–52. Cambridge, MA: MIT Press.

Chomsky, Noam. 2004. Beyond Explanatory Adequacy. In *Structures & Beyond: The Cartography of Syntactic Structures*, ed. Adriana Belletti, 104–131. Oxford: Oxford University Press.

Chomsky, Noam. 2005. Three factors in language design. *Linguistic Inquiry* 35:1–22.

Chomsky, Noam. 2008. On phases. In *Foundational Issues in Linguistic Theory: Essays in Honor of Jean-Roger Vergnaud*, ed. Carlos Otero, Robert Freidin, and María-Luísa Zubizarreta, 133–166. Cambridge, MA: MIT Press.

Chomsky, Noam. 2010. Restricting stipulations: consequences and challenges. Talk given at the University of Stuttgart, March 24.

Chomsky, Noam. In press. Problems of Projection. *Lingua* .

Christensen, Kirsti Koch. 1991. AGR, Adjunction, and the Structure of Scandinavian Existential Sentences. *Lingua* 84:137–158.

Cinque, Guglielmo. 1999. *Adverbs & Functional Heads: A Cross-Linguistic Perspective*. Oxford: Oxford University Press.

Cinque, Guglielmo, and Luigi Rizzi. 2008. The Cartography of Syntactic Structures. *Studies in Linguistics* 2:42–58.

Citko, Barbara. 2005. On the nature of Merge: External Merge, Internal Merge, & Parallel Merge. *Linguistic Inquiry* 36:475–496.

Clark, Eve V., and Herbert H. Clark. 1979. When Nouns Surface as Verbs. *Language* 55:767–811.

Collins, Chris. 1997. *Local Economy*. Cambridge, MA: MIT Press.

Collins, Chris. 2002. Eliminating Labels. In *Derivation and Explanation in the Minimalist Program*, ed. Samuel David Epstein and T. Daniel Seely, 42–64. Malden, MA: Blackwell.

Collins, Chris, and Edward Stabler. 2011. A Formalization of Minimalist Syntax. Ms., New York University and UCLA.

Collins, John. 2011. *The Unity of Linguistic Meaning*. Oxford: Oxford University Press.

Cooper, Robin. 1975. Montague's semantic theory and transformational syntax. Doctoral Dissertation, University of Massachusetts.

Cormack, Annabel. 1999. Without Specifiers. In *Specifiers: Minimalist Approaches*, ed. David Adger, Susan Pintzuk, Bernadette Plunkett, and George Tsoulas, 46–68. Oxford: Oxford University Press.

Crain, Stephen, and Drew Khlentzos. 2010. The Logic Instinct. *Mind & Language* 25:30–65.

Crain, Stephen, and Paul Pietroski. 2001. Nature, Nurture, and Universal Grammar. *Linguistics and Philosophy* 24:139–186.

Cuervo, María Cristina. 2003. Datives at Large. Doctoral Dissertation, MIT.

Cuervo, María Cristina. 2010. Against ditransivity. *Probus* 22:151–180.

Culicover, Peter, and Kenneth Wexler. 1973. An application of the Freezing Principle to the Dative in English. In *Social Sciences Working Papers*, volume 39, 1–29. Irvine, CA: University of California, Irvine.

Davidson, Donald. 1967. The Logical Form of Action Sentences. In *The Logic of Decision and Action*, ed. Nicolas Resher, 81–95. Pittsburgh: University of Pittsburgh Press.

Deal, Amy Rose. 2009. The Origin and Content of Expletives: Evidence from "Selection". *Syntax* 12:285–323.

Déprez, Vivane. 1989. On the Typology of Syntactic Projections and the Nature of Chains: Move-alpha to the Specifier of Functional Projections. Doctoral Dissertation, MIT.

den Dikken, Marcel. 2006. *Relators and Linkers: The Syntax of Predication, Predicate Inversion, and Copulas*. Cambridge, MA: MIT Press.

den Dikken, Marcel. 2007. Phase Extension: Countours of a theory of the role of head movement in phrasal extraction. *Theoretical Linguistics* 33:1–41.

Doron, Edit, and Caroline Heycock. 1999. Filling and Licensing Multiple Specifiers. In *Specifiers: Minimalist Approaches*, ed. David Adger, Susan Pintzuk, Bernadette Plunkett, and George Tsoulas, 69–89. Oxford: Oxford University Press.

Dotlačil, Jakub. 2010. Anaphora and Distributivity: A study of *same, different.* reciprocals and *others.* Doctoral Dissertation, Utrecht University.

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Dowty, David. 1989. On the semantic content of the notion of 'thematic role'. In *Properties, Types and Meanings.*, ed. Gennaro Chierchia, Barbara H. Partee, and Raymond Turner, volume Vol 2: Semantic Issues, 69–130. Dordrecht: Kluwer.

Dowty, David. 1991. Thematic proto-roles and argument selection. *Language* 67:547–619.

Dowty, David R. 1979. *Word Meaning and Montague Grammar*. Dordrecht: Reidel.

Dowty, David R., and Pauline Jacobson. 1989. Agreement as a semantic phenomenon. *Proceedings of ESCOL* 5:95–108.

Drummond, Alex, and Norbert Hornstein. 2011. Basquing in Minimalism. *Biolinguistics* 5:331–349.

Dubinsky, Stanley, and Sylvester Ron Simango. 1996. Passive and Stative in Chichewa: Evidence for Modular Distinctions in Grammar. *Language* 72:749–781.

Elbourne, Paul. 2011. *Meaning: A Slim Guide to Semantics*. Oxford: Oxford University Press.

Embick, David. 2004. On the Structure of Resultative Participles in English. *Linguistic Inquiry* 35:355–392.

Embick, David. 2010. *Localism vs. Globalism in Morphology and Phonology*. Cambridge, MA: MIT Press.

Emonds, Joseph. 1976. *A Transformational Approach to English Syntax*. New York: Academic Press.

Emonds, Joseph. 2000. *Lexicon and Grammar: The English Syntacticon*. Berlin: Mouton de Gruyter.

Epstein, Samuel David. 2007. On I(nternalist)-Functional Explanation in Minimalism. *Linguistic Analysis* 33:20–53.

Epstein, Samuel David. 2009. The Unification of Theta Relations: How TRANSFER Renders Specvp a Theta Marked Complement. Ms., University of Michigan.

Epstein, Samuel David, Erich M. Groat, Ruriko Kawashima, and Hisatsugu Kitahara. 1998. *A Derivational Approach to Syntactic Relations*. Oxford: Oxford University Press.

Epstein, Samuel David, Hisatsuguta Kitahara, and T. Daniel Seely. In press. Structure Building that Can't Be. In *Ways of Structure Building*, ed. Myriam Uribe-Etxebarria and Vidal Valmala. Oxford: Oxford University Press.

Epstein, Samuel David, Acrisio Pires, and T. Daniel Seely. 2005. EPP in T: More Controversial Subjects. *Syntax* 8:65–80.

Epstein, Samuel David, and T. Daniel Seely. 2002. Rule Applications as Cycles in a Level-free Syntax. In *Derivation and Explanation in the Minimalist Program*, ed. Samuel David Epstein and T. Daniel Seely, 65–89. Malden, MA: Blackwell.

Epstein, Samuel David, and T. Daniel Seely. 2006. *Derivations in Minimalism*. Cambridge: Cambridge University Press.

Farmer, Ann Kathleeen. 1980. On the Interaction of Morphology and Syntax. Doctoral Dissertation, MIT.

Ferreira, Marcelo. 2005. Event Quantification and Plurality. Doctoral Dissertation, MIT.

Fodor, Jerry. 1975. *The Language of Thought*. New York: Crowell.

Fodor, Jerry. 1987. *Psychosemantics: The problem of meaning in the philosophy of mind*. Cambridge, MA: MIT Press.

Fodor, Jerry. 2001. Language, thought and compositionality. *Mind & Language* 16:1–15.

Fodor, Jerry. 2008. *LOT2: The Language of Thought Revisited*. Oxford: Oxford University Press.

Folli, Raffaella, and Heidi Harley. 2006. On the Licensing of Causatives of Directed Motion: Waltzing Matilda all over. *Studia Linguistica* 60:121–155.

Folli, Raffaella, and Heidi Harley. 2007. Causation, Obligation, and Argument Structure: On the Nature of Little v. *Linguistic Inquiry* 38:197–238.

Freidin, Robert. 1999. Cyclicity & Minimalism. In *Working Minimalism*, ed. Samuel David Epstein and T. Daniel Seely, 95–126. Cambridge, MA: MIT Press.

Freidin, Robert, and Howard Lasnik. 2011. Some Roots of Minimalism in Generative Grammar. In *The Oxford Handbook of Linguistic Minimalism*, ed. Cedric Boeckx, 1–26. Oxford: Oxford University Press.

Fukui, Naoki. 1986. A Theory of Category Projection and its Applications. Doctoral Dissertation, MIT.

Fukui, Naoki, and Margaret Speas. 1986. Specifiers and projection. *MIT Working Papers in Linguistics: Papers in Theoretical Linguistics* 8:128–172.

Gallego, Ángel J. 2010. *Phase Theory*. Amsterdam: John Benjamins.

van Gelderen, Elly. 2008. Where did Late Merge go? *Studia Linguistica* 62:287–300.

van Gelderen, Elly. To appear. *The Minimalist Clause*. Cambridge: Cambridge University Press.

George, Leland Maurice. 1980. Analogical Generalization in Natural Language Syntax. Doctoral Dissertation, MIT.

Glanzberg, Michael. 2011. Meaning, Concepts, and the Lexicon. *Croatian Journal of Philosophy* 11:3–31.

Goldberg, Adele E. 1995. *Constructions: A Construction Grammar Approach to Argument Structure*. Chicago: The University of Chicago Press.

Goldberg, Adele E. 2006. *Constructions at Work*. Oxford: Oxford University Press.

Gomeshi, Jila, and Diane Massam. 1994. Lexical/Syntactic Relations Without Projection. *Linguistic Analysis* 24:175–217.

Grimshaw, Jane. 1979. Complement Selection and the Lexicon. *Linguistic Inquiry* 10:279–326.

Grimshaw, Jane. 1990. *Argument Structure*. Cambridge, MA: MIT Press.

Gruber, Jeffrey S. 1965. Studies in Lexical Relations. Doctoral Dissertation, MIT.

Haegeman, Liliane. 1994. *Introduction to Government and Binding Theory*. Malden, MA: Blackwell, 2nd edition.

Hale, Kenneth. 1980. Remarks on Japanese Phrase Structure. *MIT Working Papers in Linguistics* 2.

Hale, Kenneth, and Samuel Jay Keyser. 1993. On argument structure & the lexical expression of syntactic relations. In *The view from Building 20: essays in honor of Sylvain Bromberger*, ed. Kenneth Hale and Samuel Jay Keyser. Cambridge, MA: MIT Press.

Hale, Kenneth, and Samuel Jay Keyser. 2002. *Prolegomenon to a Theory of Argument Structure*. Cambridge, MA: MIT Press.

Halle, Morris, and Alec Marantz. 1993. Distributed morphology & the pieces of inflection. In *The view from Building 20: essays in honor of Sylvain Bromberger*, ed. Kenneth Hale and Samuel Jay Keyser, 111–176. Cambridge, MA: MIT Press.

Hallman, Peter. 2004. Symmetry in Structure Building. *Syntax* 7:79–100.

Harley, Heidi. 1995. Subjects, Events and Licensing. Doctoral Dissertation, MIT.

Harley, Heidi. 2009. Roots and Locality. Talk given at the Roots workshop, University of Stuttgart, June 10.

Harman, Gilbert. 1972. Logical Form. *Foundations of Language* 9:38–65.

Heim, Irene. 1982. The Semantics of Definite and Indefinite Noun Phrases. Doctoral Dissertation, University of Massachusetts.

Heim, Irene, and Angelika Kratzer. 1998. *Semantics in Generative Grammar*. Malden, MA: Blackwell.

Herburger, Elena. 2000. *What Counts: Focus and Quantification*. Cambridge, MA: MIT Press.

Hestvik, Arild. 1986. Case Theory and Norwegian Impersonal Constructions: Subject-Object Alternations in Active and Passive Verbs. *Nordic Journal of Linguistics* 9:181–197.

Heycock, Caroline. 1991. Layers of Predication: The Non-lexical Syntax of Clauses. Doctoral Dissertation, University of Pennsylvania.

Higginbotham, James. 1983. Logical Form, Binding and Nominals. *Linguistic Inquiry* 14:395–420.

Higginbotham, James. 1985. On Semantics. *Linguistic Inquiry* 16:547–593.

Higginbotham, James. 1986. Linguistic Theory and Davidson's Program. In *Inquiries into Truth and Interpretation*, ed. Ernest Lepore, 29–48. Oxford: Basil Blackwell.

Hinzen, Wolfram. 2006. *Mind Design & Minimal Syntax*. Oxford: Oxford University Press.

Hoekstra, Eric. 1991. Licensing Conditions on Phrase Structure. Doctoral Dissertation, University of Groningen.

Hoekstra, Eric. 1994. Agreement and the Nature of Specifiers. In *Minimalism and Kayne's Antisymmetry Hypothesis*, ed. C. Jan-Wouter Zwart, volume 37, 159–168. Groninger Arbeiten zur Germanistischen Linguistik.

Hornstein, Norbert. 1977. S and X-bar Convention. *Linguistic Analysis* 3:137–176.

Hornstein, Norbert. 1984. *Logic as Grammar: An Approach to Meaning in Natural Language*. Cambridge, MA: MIT Press.

Hornstein, Norbert. 1995a. *Logical Form*. Malden, MA: Blackwell.

Hornstein, Norbert. 1995b. Putting Truth into Universal Grammar. *Linguistics and Philosophy* 18:381–400.

Hornstein, Norbert. 1999. Movement and Control. *Linguistic Inquiry* 30:69–96.

Hornstein, Norbert. 2002. A Grammatical Argument for a Neo-Davidsonian Semantics. In *Logical Form and Language*, ed. Gerhard Preyer and Georg Peters, 345–364. Oxford: Oxford University Press.

Hornstein, Norbert. 2007. Pronouns in a Minimalist Setting. In *The Copy Theory of Movement*, ed. Norbert Corver and Jairo Nunes, 351–385. Amsterdam: John Benjamins.

Hornstein, Norbert. 2009. *A Theory of Syntax: Minimal Operations & Universal Grammar*. Cambridge: Cambridge University Press.

Hornstein, Norbert, and David W. Lightfoot. 1981. Introduction. In *Explanation in Linguistics*, ed. Norbert Hornstein and David W. Lightfoot. London: Longmans.

Hornstein, Norbert, and Jairo Nunes. 2002. On asymmetries between parasitic gap and across-the-board constructions. *Syntax* 5:26–54.

Hornstein, Norbert, and Paul Pietroski. 2009. Basic operations: minimal syntax-semantics. *Catalan Journal of Linguistics* 8:113–139.

Hornstein, Norbert, and Jacek Witkos. 2003. Yet another approach to existential constructions. In *Grammar in Focus: Festschrift for Christer Platzack*, ed. Lars-Olof Delsing, Cecilia Falk, Gunnlög Joseffson, and Halldór Á. Sigurðsson, 167–184. Lund: Department of Scandinavian Languags, University of Lund.

Horwich, Paul. 1997. The Composition of Meanings. *The Philosophical Review* 106:503–532.

Horwich, Paul. 1998. *Meaning*. Oxford: Oxford University Press.

Huang, C.-T. James. 1982. Logical relations in Chinese & the theory of grammar. Doctoral Dissertation, MIT.

Huang, C.-T. James, Yen-hui Audrey Li, and Yafei Li. 2009. *The Syntax of Chinese*. Cambridge: Cambridge University Press.

Hunter, Tim. 2010. Relating Movement and Adjunction in Syntax and Semantics. Doctoral Dissertation, University of Maryland.

Idsardi, William J., and Eric Raimy. In press. Three types of linearization and the temporal aspects of speech. In *Principles of Linearization*, ed. M. Theresa Biberauer and Ian Roberts. Berlin: Mouton de Gruyter.

Jackendoff, Ray. 1972. *Semantic Interpretation in Generative Grammar*. Cambridge, MA: MIT Press.

Jackendoff, Ray. 1977. *X-bar Syntax: A Study of Phrase Structure*. Cambridge, MA: MIT Press.

Jacobson, Pauline. 1998. Antecedent Contained Deletion and Pied-Piping: Evidence for a Variable-Free Semantics. In *Proceedings of SALT 8*, 74–91.

Jacobson, Pauline. 2002. The (Dis)organization of the Grammar: 25 Years. *Linguistics and Philosophy* 25:601–626.

Jacobson, Pauline. 2008. Direct compositionality and variable-free semantics: the case of Antecedent Contained Deletion. In *Topics in Ellipsis*, ed. Kyle Johnson, 30–68. Cambridge: Cambridge University Press.

Jayaseelan, K. A. 2008a. Bare Phrase Structure and Specifier-less Syntax. *Biolinguistics* 2:87–106.

Jayaseelan, K. A. 2008b. Question particles and disjunction. Ms., The English & Foreign Languages University.

Jeong, Youngmi. 2006. The landscape of applicatives. Doctoral Dissertation, U. of Maryland.

Jeong, Youngmi. 2007. *Applicatives: Structure and Interpretation from a Minimalist Perspective*. Amsterdam: John Benjamins.

Johnson, Kyle. 1991. Object Positions. *Natural Language & Linguistic Theory* 9:577–636.

Jurka, Johannes. 2010. The Importance of Being a Complement: CED-Effects Revisited. Doctoral Dissertation, University of Maryland.

Kawamura, Tomoko. 2007. Some interactions of focus and focus sensitive elements. Doctoral Dissertation, Stony Brook University.

Kayne, Richard S. 1984. *Connectedness & Binary Branching*. Dordrecht: Foris.

Kayne, Richard S. 1985. Principles of Particle Constructions. In *Grammatical Representation*, ed. Jacqueline Guéron, Hans-Georg Obenauer, and Jean-Yves Pollock, 101–140. Dordrecht: Foris.

Kayne, Richard S. 1994. *The Antisymmetry of Syntax*. Cambridge, MA: MIT Press.

Kayne, Richard S. 2008. Expletives, datives, and the tension between morphology and syntax. In *The Limits of Syntactic Variation*, ed. M. Theresa Biberauer, 175–217. Amsterdam: John Benjamins.

Kayne, Richard S. 2009. More Articles Than Meet the Eye. Talk given at the Workshop on Bare Nouns, Université Paris Diderot, November 27.

Kayne, Richard S. 2010. Why Are There No Directionality Parameters. Ms., New York University.

Kjøll, Georg. 2011. Word meaning, concepts and the representation of abstract entities from the perspective of radical pragmatics and semantic externalism. Doctoral Dissertation, University of Oslo.

Klein, Ewan, and Ivan Sag. 1985. Type-Driven Translation. *Linguistics and Philosophy* 8:162–202.

Koizumi, Masatoshi. 1995. Phrase Structure in Minimalist Syntax. Doctoral Dissertation, MIT.

Koopman, Hilda. 2006. Agreement configurations. In *Agreement Systems*, ed. Cedric Boeckx, 159–199. Amsterdam: John Benjamins.

Kornai, András, and Geoffrey K. Pullum. 1990. The x-bar theory of phrase structure. *Language* 66:24–50.

Kratzer, Angelika. 1996. Severing the External Argument from the Verb. In *Phrase Structure and the Lexicon*, ed. Johan Rooryck and Laurie Zaring, 109–137. Dordrecht: Kluwer.

Kratzer, Angelika. 2000. The Event Argument: Chapter 2. Ms., University of Massachusetts.

Kratzer, Angelika. 2005. Building resultatives. In *Events in Syntax, Semantics,*

and Discourse, ed. Claudia Maienborn and Angelika Wöllstein-Leisten, 177–212. Tübingen: Niemeyer.

Krifka, Manfred. 1989. Nominal Reference, Temporal Constitution and Quantification in Event Semantics. In *Semantics and Contextual Expression*, ed. Renate Bartsch, J. F. A. K. Benthem, and P. van Emde Boas, 75–115. Dordrecht: Foris.

Krifka, Manfred. 1992. Thematic relations as links between nominal reference and temporal constitution. In *Lexical Matters*, ed. Ivan Sag and Anna Szabolcsi, 29–53. Stanford: CSLI.

Kuno, Susumu. 1973. *The Structure of the Japanese Language*. Cambridge, MA: MIT Press.

Kupin, Joseph. 1978. A Motivated Alternative to Phrase Markers. *Linguistic Inquiry* 9:303–308.

Kučerovà, Ivona. 2009. The T-Extension Condition. Ms., University College London.

Lakoff, George. 1971. On generative semantics. In *Semantics: An Interdisciplinary Reader in Philosophy, Linguistics and Psychology*, ed. Danny D. Steinberg and Leon A. Jakobovits, 232–296. Cambridge: Cambridge University Press.

Lakoff, George. 1972. Linguistics and natural logic. In *Semantics of Natural Language*, ed. Gilbert Harman and Donald Davidson, 545–665. Dordrecht: D. Reidel.

Landau, Idan. 2007. EPP Extensions. *Linguistic Inquiry* 38:485–523.

Landau, Idan. 2010. *The Locative Syntax of Experiencers*. Cambridge, MA: MIT Press.

Landman, Fred. 2000. *Events and Plurality*. Dordrecht: Kluwer.

Larson, Bradley. 2011. A Sparse Approach to Right Node Raising. Ms., University of Maryland.

Larson, Bradley. In press. A Dilemma with Accounts of Right Node Raising. *Linguistic Inquiry* 43.

Larson, Richard K. 1988. On the Double Object Construction. *Linguistic Inquiry* 19:335–391.

Larson, Richard K. 1991. Some issues in verb serialization. In *Serial Verbs*, ed. Claire Lefebvre, 185–210. Amsterdam: John Benjamins.

Larson, Richard K. Forthcoming. *Essays in Shell Structure*. London: Routledge.

Larson, Richard K., and Gabriel Segal. 1995. *Knowledge of meaning*. Cambridge, MA: MIT Press.

Lasersohn, Peter. 1995. *Plurality, Conjunction and Events*. Dordrecht: Kluwer.

Lasnik, Howard. 1981. Restricting the Theory of Transformations. In *Explanation in Linguistics*, ed. Norbert Hornstein and David W. Lightfoot, 152–173. London: Longmans.

Lasnik, Howard. 1995. Verbal Morphology: *Syntactic Structures* Meets the Minimalist Program. In *Evolution & Revolution in Linguistic Theory: A Festschrift*

in Honor of Carlos Otero, ed. H. Campos and P. Kempchinsky, 251–275. Washington, D.C.: Georgetown University Press.

Lasnik, Howard. 1999. On Feature Strength: Three Minimalist Approaches to Overt Movement. *Linguistic Inquiry* 30:197–217.

Lasnik, Howard. 2000. *Syntactic Structures Revisited: Contemporary Lectures on Classic Transformational Theory*. Cambridge, MA: MIT Press.

Lasnik, Howard. 2001a. A Note on the EPP. *Linguistic Inquiry* 32:356–362.

Lasnik, Howard. 2001b. Subjects, Objects, and the EPP. In *Objects and Other Subjects: Grammatical Functions, Functional Categories, and Configurationality*, ed. William D. Davies and Stanley Dubinsky, 103–121. Dordrecht: Kluwer.

Lasnik, Howard. 2003. On the Extended Projection Principle. *Studies in Modern Grammar* 31:1–23.

Lasnik, Howard. 2006. Conceptions of the Cycle. In *Wh-Movement: Moving On*, ed. Lisa Lai-Shen Cheng and Norbert Corver, 197–216. Cambridge, MA: MIT Press.

Lasnik, Howard, and Joseph Kupin. 1977. A restrictive theory of transformational grammar. *Theoretical Linguistics* 4:173–196.

Lasnik, Howard, and Terje Lohndal. In press. Brief Overview of the History of Generative Syntax. In *The Cambridge Handbook of Generative Syntax*, ed. Marcel den Dikken. Cambridge: Cambridge University Press.

Lasnik, Howard, and Mamoru Saito. 1991. On the subject of infinitives. In *Papers from the 27th Regional Meeting of the Chicago Linguistic Society*, ed. Lise M. Dobrin, Lynn Nichols, and Rosa M. Rodriguez, 324–343. Chicago Linguistic Society, University of Chicago, Chicago, Ill.

Lasnik, Howard, and Mamoru Saito. 1992. *Move alpha*. Cambridge, MA: MIT Press.

Lasnik, Howard, and Juan Uriagereka. 1988. *A Course in GB Syntax*. Cambridge, MA: MIT Press.

LaTerza, Chris. 2011. Floating Reciprocals. Ms., University of Maryland.

Levin, Beth. 1993. *English Verb Classes and Alternations: A Preliminary Investigation*. Chicago: University of Chicago Press.

Levin, Beth, and Malka Rappaport Hovav. 1995. *Unaccusativity*. Cambridge, MA: MIT Press.

Levin, Beth, and Malka Rappaport Hovav. 2005. *Argument Realization*. Cambridge: Cambridge University Press.

Lightfoot, David W. 1979. *Principles of Diachronic Syntax*. Cambridge: Cambridge University Press.

Lin, Tzong-Hong. 2001. Light Verb Syntax and the Theory of Phrase Structure. Doctoral Dissertation, University of California, Irvine.

Lohndal, Terje. 2009. Comp-t effects: variation in the position & features of C. *Studia Linguistica* 63:204–232.

Lohndal, Terje. 2011a. Cognizing Language: I-Meanings and Semantic Competence. Talk given at the Harvard-Australia Workshop on Language, Logic and Learning, Macquire University, August 22.

Lohndal, Terje. 2011b. Freezing Effects and Objects. *Journal of Linguistics* 47:163–199.

Lohndal, Terje, and Paul Pietroski. 2011. Interrogatives, Instructions, and I-languages: An I-Semantics for Questions. *Linguistic Analysis* 37:458–515.

Lohndal, Terje, and Bridget Samuels. 2010. Linearizing Empty Edges. Ms., University of Maryland.

Luria, Salvador. 1973. *Life, the Unfinished Experiment*. New York: Charles Scribner's Sons.

Lyons, John. 1968. *Introduction to Theoretical Linguistics*. Cambridge: Cambridge University Press.

Mahajan, Anoop. 1989. Agreement and agreement phrases. *MIT Working Papers in Linguistics* 10:217–252.

Manzini, Maria Rita. 1992. *Locality: A Theory and Some of Its Empirical Consequences*. Cambridge, MA: MIT Press.

Manzini, Maria Rita, and Leonardo Savoia. 1997. Null subjects without pro. *UCL Working Papers in Linguistics* 9:1–12.

Marantz, Alec. 1984. *On the Nature of Grammatical Relations*. Cambridge, MA: MIT Press.

Marantz, Alec. 1991. Case and Licensing. *Proceedings of ESCOL* 234–253.

Marantz, Alec. 1993. Implications of asymmetries in double object constructions. In *Theoretical Aspects of Bantu Grammar*, ed. Sam Mchombo, 113–150. Stanford: CSLI.

Marantz, Alec. 1997. No escape from syntax: don't try morphological analysis in the privacy of your own lexicon. In *Proceedings of PLC 21*, ed. A. Dimitriadis, L. Siegel, C. Surek-Clark, and A. Williams, 201–225.

Marantz, Alec. 2001. Words. Ms., MIT.

Marantz, Alec. 2005. Objects Out of the Lexicon: Objects as Events. Ms., MIT.

Martin, Roger. 1999. Case, the Extended Projection Principle, and Minimalism. In *Working Minimalism*, ed. Samuel David Epstein and Norbert Hornstein, 1–26. Cambridge, MA: MIT Press.

Marušic, Franc. 2005. On non-simultaneous phases. Doctoral Dissertation, Stony Brook University.

May, Robert. 1977. The Grammar of Quantification. Doctoral Dissertation, MIT.

May, Robert. 1985. *Logical Form*. Cambridge, MA: MIT Press.

McCawley, James D. 1968. Lexical insertion in a grammar without deep structure. *Papers from the Fourth Regional Meeting of the Chicago Linguistic Society* 71–80.

McCawley, James D. 1970. English as a VSO Language. *Language* 46:286–299.

McCawley, James D. 1973. *Grammar and Meaning: Papers on Syntactic and Semantic Topics*. Tokyo: Taishukan/New York: Academic Press.

McCawley, James D. 1982. Parentheticals and Discontinuous Constituent Structure. *Linguistic Inquiry* 13:91–106.

McCloskey, James. 1997. Subjecthood and Subject Positions. In *Elements of Grammar*, ed. Liliane Haegeman, 197–235. Dordrecht: Kluwer.

McGilvray, James. 1998. Meanings Are Syntactically Individuated and Found in the Head. *Mind & Language* 13:225–280.

McGilvray, James. In press. *Chomsky: Language, Mind, and Politics*. Cambridge: Polity, 2nd edition.

McGinnis, Martha. 2001. Variation in the phase structure of applicatives. In *Linguistic variation yearbook*, volume 1, 105–146. Amsterdam: John Benjamins.

McKay, Thomas J. 2006. *Plural Predication*. Oxford: Clarendon Press.

Merchant, Jason. 2001. *The Syntax of Silence: Sluicing, Islands, and the Theory of Ellipsis*. Oxford: Oxford University Press.

Merchant, Jason. 2004. Some working definitions (second version). handout, syntax 1, fall. Ms., University of Chicago.

Montague, Richard. 1970. Universal Grammar. *Theoria* 36:373–398.

Montague, Richard. 1974a. *Formal Philosophy*. New Haven: Yale University Press.

Montague, Richard. 1974b. The Proper Treatment of Quantification in Ordinary English. In *Approaches to Natural Language: Proceedings of the 1970 Stanford Workshop on Grammar and Semantics*, ed. Jaakko Hintikka, Julius Moravcsik, and Patrick Suppes, 221–242. Dordrecht: D. Reidel.

Moro, Andrea. 2000. *Dynamic Antisymmetry*. Cambridge, MA: MIT Press.

Moro, Andrea. 2008. Rethinking symmetry: a note on labelling and the EPP. Ms., Vita-Salute San Raffaele University.

Müller, Gereon. 1998. *Incomplete Category Fronting: A Derivational Approach to Remnant Movement in German*. Dordrecht: Kluwer.

Müller, Gereon. 2010. On Deriving CED Effects from the PIC. *Linguistic Inquiry* 41:35–82.

Muysken, Pieter. 1982. Parametrizing the notion "Head". *Journal of Linguistic Research* 2:57–75.

Myers, Scott. 1984. Zero-derivation and inflection. *MIT Working Papers in Linguistics* 7:53–69.

Narita, Hiroki. 2009. Multiple transfer in service of recursive Merge. Paper presented at GLOW XXXII, Nantes.

Narita, Hiroki. 2011. Phasing in Full Interpretation. Doctoral Dissertation, Harvard University.

Nevins, Andrew Ira. 2004. Derivations without the Activity Condition. *MIT Working Papers in Linguistics: Perspectives on Phases* 49:287–310.

Nunes, Jairo. 2001. Sideward Movement. *Linguistic Inquiry* 32:303–344.

Nunes, Jairo. 2004. *Linearization of Chains and Sideward Movement*. Cambridge, MA: MIT Press.

Nunes, Jairo, and Juan Uriagereka. 2000. Cylicity and Extraction Domains. *Syntax* 3:20–43.

Ochi, Masao. 1999. Some Consequences of Attract F. *Lingua* 109:81–107.

O'Grady, William. 1998. The Syntax of Idioms. *Natural Language & Linguistic Theory* 16:279–312.

Ormazabal, Javier. 1995. The Syntax of Complementation: On the Connection Between Syntactic Structure and Selection. Doctoral Dissertation, University of Connecticut.

Pagin, Peter, and Dag Westerståhl. 2010a. Compositionality I: Definitions and Variants. *Philosophy Compass* 5:250–264.

Pagin, Peter, and Dag Westerståhl. 2010b. Compositionality II: Arguments and Problems. *Philosophy Compass* 5:265–282.

Parsons, Terence. 1990. *Events in the Semantics of English*. Cambridge, MA: MIT Press.

Parsons, Terence. 1993. Thematic Relations and Arguments. Ms., University of California, Irvine.

Partee, Barbara H. 1992. Topic, Focus and Quantification. In *Proceedings of SALT1*, ed. Steven Moore and Adam Wyner, 159–187.

Partee, Barbara H. 1999. Focus, Quantification, and Semantics-Pragmatics Issues. In *Focus: Linguistic, Cognitive, and Computational Perspectives*, ed. Peter Bosch and Rob van der Sandt, 213–231. Cambridge: Cambridge University Press.

Partee, Barbara H. 2006. Do we need two basic types? In *40-60 puzzles or manfred krifka*, ed. Hans-Martin Gärtner, Sigrid Beck, Regine Eckardt, Renate Musan, and Barbara Stiebels. Online: http://www.zas.gwz-berlin.de/publications/40-60-puzzles-for-krifka/.

Patterson, Douglas. 2009. Inconsistency Theories of Semantic Paradox. *Philosophy and Phenomenological Research* 79:387–422.

Perlmutter, David. 1971. *Deep and Surface Constraints in Syntax*. New York: Holt, Rinehart, & Winston.

Perlmutter, David. 1978. Impersonal Passives and the Unaccusative Hypothesis. In *Proceedings of BLS*, 4, 157–189.

Pesetsky, David. 1982. Paths and Categories. Doctoral Dissertation, MIT.

Pesetsky, David. 1991. Zero Syntax: Vol. 2: Infinitives. Ms., MIT.

Pietroski, Paul. 2005a. *Events & Semantic Architecture*. Oxford: Oxford University Press.

Pietroski, Paul. 2005b. Meaning before Truth. In *Contextualism in Philosophy*, ed. Gerhard Preyer and Georg Peters, 253–300. Oxford: Oxford University Press.

Pietroski, Paul. 2007. Systematicity via Monadicity. *Croatian Journal of Philosophy* 7:343–374.

Pietroski, Paul. 2008a. Lexicalizing and combining. Ms., University of Maryland.

Pietroski, Paul. 2008b. Minimalist meaning, internalist interpretation. *Biolinguistics* 2:317–341.

Pietroski, Paul. 2010a. Concepts, Meanings, and Truth: First Nature, Second Nature, and Hard Work. *Mind & Language* 25:247–278.

Pietroski, Paul. 2010b. Constructing Conjunctive Concepts: Meanings as Human Begriffsplans. Talk given at the Workshop on Word Meaning, Center for the Study of Mind in Nature, University of Oslo, Sept 2.

Pietroski, Paul. 2011. Minimal semantic instructions. In *The Oxford handbook of linguistic minimalism*, ed. Cedric Boeckx, 472–498. Oxford: Oxford University Press.

Pietroski, Paul. Forthcoming. *Semantics Without Truth Values*. Oxford: Oxford University Press.

Pietroski, Paul, and Stephen Crain. 2005. Innate Ideas. In *The Cambridge Companion to Chomsky*, ed. James McGilvray, 164–180. Cambridge: Cambridge University Press.

Platzack, Christer. 2011. Towards a Minimal Argument Structure. Ms., Lund University.

Pollock, Jean-Yves. 1989. Verc Movement, Universal Grammar, and the Structure of IP. *Linguistic Inquiry* 20:365–424.

Postal, Paul M. 1974. *On Raising: One Rule of English Grammar and its Theoretical Implications*. Cambridge, MA: MIT Press.

Pullum, Geoffrey K. 1985. Assuming some version of x-bar theory. *Chicago Linguistic Society* 21:323–353.

Putnam, Michael T. 2007. *Scrambling and the Survive Principle*. Amsterdam: John Benjamins.

Pylkkänen, Liina. 2008. *Introducing Arguments*. Cambridge, MA: MIT Press.

Quine, W.V.O. 1960. *Word and Object*. Cambridge, MA: MIT Press.

Ramchand, Gillian. 2008. *Verb Meaning and the Lexicon: A First Phase Syntax*. Cambridge: Cambridge University Press.

Rappaport, Malka. 1983. On the Nature of Derived Nominals. In *Papers in Lexical Functional Grammar*, ed. Lori et al. Levin, 113–142. Indiana University Linguistics Club.

Reinhart, Tanya. 1997. Quantifier Scope: How Labor Is Divided between QR and Choice Functions. *Linguistics and Philosophy* 20:335–397.

Reinhart, Tanya. 2002. The Theta System: An Overview. *Theoretical Linguistics* 28:229–290.

Reuland, Eric. 2001. Primitives of Binding. *Linguistic Inquiry* 32:439–492.

Reuland, Eric. 2011. *Anaphora and Language Design*. Cambridge, MA: MIT Press.

Richards, Marc. 2004. Object shift, scrambling, & symmetrical syntax. Doctoral Dissertation, University of Cambridge.

Richards, Marc. 2008. Two kinds of variation in a minimalist system. In *Varieties of competition*, ed. Fabian Heck, Gereon Müller, and Jochen Trommer, 133–162. Linguistische Arbeits Berichte 87.

Richards, Marc, and M. Theresa Biberauer. 2005. Explaining Expl. In *The Function of Function Words and Functional Categories*, ed. Marcel den Dikken and Christina Tortora, 115–153. Amsterdam: John Benjamins.

Richards, Norvin. 2010a. A Metrical Theory of EPP. Poster presented at WCCFL, USC, February.

Richards, Norvin. 2010b. *Uttering Trees*. Cambridge, MA: MIT Press.

van Riemsdijk, Henk. 1998. Categorial feature magnetism: The endocentricity and distribution of projections. *Journal of Comparative Germanic Linguistics* 2:1–48.

Rimell, Laura, and Thomas Leu. 2005. VP-Preposing and Relative Scope. In *Proceedings of PLC 28*, volume 11 of *UPenn Working Papers in Linguistics*, 241–251.

Ritter, Elizabeth, and Sara Thomas Rosen. 1996. Strong and Weak Predicates: Reducing the lexical burden. *Linguistic Analysis* 26:29–62.

Rizzi, Luigi. 1982. *Issues in Italian Syntax*. Dordrecht: Foris.

Rizzi, Luigi. 1990. *Relativized minimality*. Cambridge, MA: MIT Press.

Rizzi, Luigi. 1997. The Fine Structure of the Left Periphery. In *Elements of Grammar*, ed. Liliane Haegeman. Dordrecht: Kluwer.

Roberts, Ian. 2005. *Principles and Parameters in a VSO Language: A Case Study in Welsh*. Oxford: Oxford University Press.

Ross, John R. 1967. Constraints on variables in syntax. Doctoral Dissertation, MIT.

Rothstein, Susan. 1983. The Syntactic Forms of Predication. Doctoral Dissertation, MIT.

Rothstein, Susan. 1998. Introduction. In *Events and Grammar*, ed. Susan Rothstein, 1–11. Dordrecht: Kluwer.

Rubin, Edward J. 2003. Determining Pair-Merge. *Linguistic Inquiry* 34:660–668.

Ruwet, Nicolas. 1991. On the Use and Abuse of Idioms. In *Syntax and Human Experience*, ed. John A. Goldsmith, 171–251. Chicago: University of Chicago Press.

Sailor, Craig, and Byron Ahn. 2010. The Voices in our Heads. Talk given at Morphological Voice and its Grammatical Interfaces, June 25.

Saito, Mamoru. 2000. Predicate Raising and Theta Relations. In *Proceedings of the 2000 Seoul International Conference on Language and Computation*, 85–113. Seoul: The LInguistic Society of Korea.

Samuels, Bridget. 2009. The structure of phonological theory. Doctoral Dissertation, Harvard University.

Samuels, Bridget. 2011. *Phonological Architecture: A Biolinguistic Perspective*. Oxford: Oxford University Press.

Schäfer, Florian. 2008. *The Syntax of (Anti-)Causatives. External Arguments in Change-of-State Contexts*. Amsterdam: John Benjamins.

Schein, Barry. 1993. *Plurals and Events*. Cambridge, MA: MIT Press.

Schein, Barry. 2002. Events and the Semantic Content of Thematic Relations. In

Logical Form and Language, ed. Gerhard Preyer and Georg Peters, 263–344. Oxford: Oxford University Press.

Schein, Barry. 2003. Adverbial, descriptive reciprocals. *Philosophical Perspectives* 17:333–367.

Schein, Barry. In press. *Conjunction Reduction Redux*. Cambridge, MA: MIT Press.

Seely, T. Daniel. 2006. Merge, derivational C-command, and subcategorization in a label-free syntax. In *Minimalist Essays*, ed. Cedric Boeckx, 182–217. Amsterdam: John Benjamins.

Shlonsky, Ur. 2010. The Cartographic Enterprise in Syntax. *Language and Linguistics Compass* 4:417–429.

Sigurðsson, Halldór Á. 2006. The Nominative Puzzle and the Low Nominative Hypothesis. *Linguistic Inquiry* 37:289–308.

Sigurðsson, Halldór Á. 2010. On EPP Effects. *Studia Linguistica* 64:159–189.

Sigurðsson, Halldór Á. To appear. On UG and Materialization. *Linguistic Analysis* .

Sigurðsson, Halldór Á., and Verner Egerland. 2009. Impersonal Null-Subjects in Icelandic and Elsewhere. *Studia Linguistica* 63:158–185.

Speas, Margaret J. 1990. *Phrase Structure in Natural Language*. Dordrecht: Kluwer.

Stainton, Robert J. 2006. *Words and Thoughts: Subsentences, Ellipsis, and the Philosophy of Language*. Oxford: Clarendon Press.

Starke, Michal. 2001. Move Dissolves into Merge: A Theory of Locality. Doctoral Dissertation, University of Geneva.

Starke, Michal. 2004. On the Inexistence of Specifiers and the Nature of Heads. In *Structures & Beyond: The Cartography of Syntactic Structures*, ed. Adriana Belletti, 252–268. Oxford: Oxford University Press.

Stechow, Arnim von. 1996. The Different Readings of Wieder 'Again': A Structural Account. *Journal of Semantics* 13:87–138.

Stepanov, Arthur. 2007. The End of CED? Minimalism and Extraction Domains. *Syntax* 80–126.

Stewart, Osamuyimen T. 2001. *The serial verb construction parameter*. New York: Garland.

Stowell, Tim. 1981. Origins of Phrase Structure. Doctoral Dissertation, MIT.

Stroik, Thomas S. 2009a. *Locality in Minimalist Syntax*. Cambridge, MA: MIT Press.

Stroik, Thomas S. 2009b. The numeration in Survive-minimalism. In *Towards a Derivational Syntax*, ed. Michael T. Putnam, 21–38. Amsterdam: John Benjamins.

Stuurman, Frits. 1985. *Phrase Structure Theory in Generative Grammar*. Dordrecht: Foris.

Svenonius, Peter. 1994. C-selection as feature-checking. *Studia Linguistica* 48:133–155.

Svenonius, Peter. 2007. Interpreting uninterpretable features. *Linguistic Analysis* 33:375–413.

Szabó, Zoltán Gendler. 2000. Compositionality as Supervenience. *Linguistics and Philosophy* 23:475–505.

Takahashi, Daiko. 1994. Minimality of Movement. Doctoral Dissertation, University of Connecticut.

Taraldsen, Knut Tarald. 1978. On the NIC, Vacuous Application and the that-trace Filter. Ms. MIT.

Taylor, Barry M. 1985. *Modes of Occurrence: Verbs, Adverbs and Events*. Oxford: Blackwell.

Tenny, Carol. 1994. *Aspectual Roles and the Syntax-semantics Interface*. Dordrecht: Kluwer.

Tenny, Carol, and James Pustejovsky. 2000. A History of Events in Linguistic Theory. In *Events as Grammatical Objects*, ed. Carol Tenny and James Pustejovsky, 3–37. Stanford: CSLI.

Travis, Lisa. 1984. Parameters and Effects of Word Order Variation. Doctoral Dissertation, MIT.

Travis, Lisa. 2010. *Inner Aspect*. Dordrecht: Kluwer.

Uriagereka, Juan. 1988. On Government. Doctoral Dissertation, University of Connecticut.

Uriagereka, Juan. 1999. Multiple Spell-Out. In *Working Minimalism*, ed. Samuel David Epstein and Norbert Hornstein, 251–282. Cambridge, MA: MIT Press.

Uriagereka, Juan. 2008. *Syntactic Anchors: On Semantic Structuring*. Cambridge: Cambridge University Press.

Uriagereka, Juan. 2011. *Spell-Out and the Minimalist Program*. Oxford: Oxford University Press.

Uriagereka, Juan, and Paul Pietroski. 2002. Dimensions of natural language. In *Derivations: Exploring the Dynamics of Syntax*, ed. Juan Uriagereka, 266–287. London: Routledge.

Vangsnes, Øystein Alexander. 2002. Icelandic expletive construction and the distribution of subject types. In *Subjects, Expletives, and the Extended Projection Principle*, ed. Peter Svenonius, 43–70. Oxford: Oxford University Press.

Vergnaud, Jean-Roger, and María-Luísa Zubizarreta. 1992. The Definite Determiner and the Inalienable Constructions in French and in English. *Linguistic Inquiry* 23:595–652.

Vikner, Sten. 1996. *Verb Movement and Expletive Subjects in the Germanic Languages*. Oxford: Oxford University Press.

Williams, Alexander. 2005. Complex Causatives and Verbal Valence. Doctoral Dissertation, University of Pennsylvania.

Williams, Alexander. 2008. Patients in Igbo and Mandarin. In *Event Structures in Linguistic Form and Interpretation*, ed. Johannes Dölling, Tatjana Heyde-Zybatow, and Martin Schäfer, 3–30. Berlin: Mouton de Gruyter.

Williams, Edwin. 1980. Predication. *Linguistic Inquiry* 11:203–238.

Williams, Edwin. 1981a. Argument Structure and Morphology. *The Linguistic Review* 1:81–114.

Williams, Edwin. 1981b. On the Notions "Lexically Related" and "Head of a Word". *Linguistic Inquiry* 12:245–274.

Zubizarreta, María-Luísa. 1982. On the relationship of the lexicon to syntax. Doctoral Dissertation, MIT.

Zubizarreta, María-Luísa. 1987. *Levels of Representation in the Lexicon and in the Syntax*. Dordrecht: Foris.

Zwart, C. Jan-Wouter. 1992. Dutch expletives and small clause predicate raising. *Proceedings of NELS* 22:477–491.

Zwart, C. Jan-Wouter. 1997. *Morphosyntax of Verb Movement: A Minimalist Approach to the Syntax of Dutch*. Dordrecht: Kluwer.

Zwart, C. Jan-Wouter. 2009. Prospects for Top-Down Derivation. *Catalan Journal of Linguistics* 8:161–187.

Zwart, C. Jan-Wouter. 2011. Structure and Order: Asymmetric Merge. In *The Oxford Handbook of Linguistic Minimalism*, ed. Cedric Boeckx, 96–118. Oxford: Oxford University Press.