

# Explaining the Resultative Parameter

## Thesis Proposal

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## 1 Introduction

The promise of generative syntax is that, given fixed innate grammatical principles, variable properties which are not directly learnable from surface properties can, in fact, be derived from directly learnable surface variation. In current minimalist theories of syntax, the locus of variation is the lexicon, as expressed succinctly by Baker's (2008) Borer-Chomsky Conjecture, given below in (1).

(1) The Borer-Chomsky Conjecture

All parameters of variation are attributable to differences in the features of particular items (e.g., the functional heads) in the lexicon. (Baker 2008)

This conjecture follows from various theoretical and empirical findings throughout the history of generative grammar, but has not yet been shown to be explanatory in the sense of Chomsky (1965). That is, it has yet to be shown how properties of the functional lexicon are systematically linked to variable properties of the languages generated by innate principles of UG. Consider the correlation between obligatory predicative adjective agreement and the impossibility of adjectival resultatives (Kratzer 2004), as can be observed in the differences between French and German. In both languages, attributive adjectives agree for number and gender (and case, in German) with the nominals they modify. The languages differ with respect to predicative agreement, however. German disallows agreement on predicative adjectives, while French requires it.

(2) French

- a. la grand \*(-e) femme  
The tall AGR woman(Fem)  
“the tall woman”
- b. La femme est grand \*(-e).  
the woman(fem) is tall AGR  
“The woman is tall.”

(3) German

- a. die groß \*(-e) Frau  
the tall AGR woman  
“the tall woman”
- b. Die Frau ist groß (\*-e).  
the woman(fem) is tall AGR  
“The woman is tall”

These patterns, being observable on the surface, are in principle learnable from the primary linguistic data (PLD).

The languages also differ in whether they allow resultative interpretations of secondary predicates (SPs). French and Italian (along with other Romance languages) allow only depictive SPs, while English and German (along with other Germanic languages) allow both depictive and resultative SPs.

(4) Germanic

- a. English
  - (i) I ate the fish raw. (depictive)
  - (ii) I hammered the metal flat. (resultative)
- b. German
  - (i) Er ißt das Fleisch roh. (Müller 2004)  
He eats the meat raw  
“He’s eating the meat raw.” (depictive)
  - (ii) Wir haben die teekanne leer getrunken. (Kratzer 2004)  
we have the teapot empty drink.PART  
“We drank the teapot dry.” (resultative)

(5) Romance

- a. French
  - (i) Pierre mange la viande crue. (Legendre 1997)  
Pierre eat.3sg the.fem meat raw.fem

- “Pierre ate the meat raw” (depictive)
- (ii) \*Il a marché les jambes raides. (Washio 1997)  
 He has walked the legs stiff  
 “He walked his legs off.” (resultative)
- b. Italian
- (i) l’ ho mangiato crudo.  
 3sg AUX.1sg eaten raw  
 “I ate it raw” (depictive)
- (ii) \*l’ ho bevuto vuoto.  
 3sg AUX.1sg drank empty  
 “I drank it dry” (resultative)

Since the variation demonstrated in (4) and (5) has to do with the meanings assigned to expressions rather than surface properties of the expressions, such variation is not, in principle, learnable from the PLD.

So, we have two types of variation (one shallow and learnable, one deep and unlearnable) which seem to be correlated with each other (predicative adjective agreement  $\leftrightarrow$  \*adjectival resultatives). Given the Borer-Chomsky Conjecture, then, it is a reasonable hypothesis that the unlearnable variation follows somehow from the learnable variation. That is, the lack of predicative adjective agreement makes adjectival resultatives possible in German, while its presence in French disallows them. The question, then, is how these two properties could be linked.

The hypothesis that such disparate phenomena might be linked should surprise no-one familiar with minimalist theorizing. In this thesis, I propose to explore the nature of such a link. Specifically, I will argue that Chomsky’s (2013; 2015) recent label theory, taken to its logical conclusion, explains the link between adjectival morphology and resultative SPs.

## 1.1 Previous Answers

The puzzle of the resultative parameter has been approached from two directions. One approach, found in the work of Folli and Harley (2006), Harley (2005), Ramchand (2008), and Tungseth (2008), among others, first asks how we might represent resultatives syntactically and then asks what a language’s lexicon would have to look like in order to block the structures underlying resultatives. Such an approach also tends to assume that lexical verbs are decomposable into several heads bearing primitive conceptual features (PROCESS, MANNER, RESULT, PATH, *etc.*) in the spirit of Hale and Keyser (1993). In my first general paper (Milway 2015, pp 30-32), I argue that Ramchand’s (2008) particular proposal, which

is perhaps the most fully realized and coherent proposal of this type, falls short of providing a syntactic analysis of the resultative parameter. Furthermore, none of the work in this approach explicitly addresses the question of how such variation could be acquired, rather, they implicitly assume that it can be acquired.

The second approach to the resultative parameter, found in the work of Beck and Snyder (2001), Roeper, Snyder, and Hiramatsu (2002), and Snyder (1995, 2001), starts with the acquisition question. In his 1995 dissertation, Snyder presents evidence from child language data that the acquisition of endocentric compounding is correlated with that of resultatives, and argues that they both follow from a single syntactic parameter, given below in (6).

(6) **The Compounding Parameter** (Snyder 2001)

The grammar {disallows\*, allows} formation of endocentric compounds during the syntactic derivation. [\*unmarked value]

While an interesting description, this work also falls short of an account of the resultative parameter because it merely identifies a correlation between two phenomena but does not attempt to establish a causal link between them. Kratzer (2004) attempts to describe such a link, but for reasons discussed in my first generals paper (Milway 2015, pp 32-34), also falls short of explanatory adequacy.

My thesis will be an attempt to unify the two approaches. Such a unification, however, will require significant revision of the logic used in each approach. I will discuss the revised logic in the following section.

## 2 Towards an explanation of the resultative parameter

In order to approach an explanation of this parametric variation, the thesis will be structured as two converging lines of inquiry. The first line will be an attempt to formalize the surface variation associated with the resultative parameter. Kratzer (2004), Roeper, Snyder, and Hiramatsu (2002), and Snyder (2001) and others identify the (un)availability of productive compounding as the relevant surface variation, while Haider (2016) identifies the (un)availability of particle verb constructions as the culprit. My previous investigation of particle verbs (Milway 2013, included as an appendix) suggests that compounding and particle verbs are related, so I will assume that the compounding parameter subsumes the particle verb parameter.<sup>1</sup> This variation is typically expressed as a parameter of the grammar, such

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<sup>1</sup>This assumption will be revised in later sections of the thesis.

as Snyder’s Compounding Parameter below.

(7) **Compounding Parameter** (Snyder 2001)

The grammar {disallows\*, allows} formation of endocentric compounds during the syntactic derivation. [\*unmarked value]

Under standard minimalist assumptions, (7) would be considered a descriptive/typological statement in need of theoretical explanation.

The first step towards such an explanation is to rephrase (7) with the Borer-Chomsky Conjecture in mind. If we consider an I-language,  $L$ , to be the pair  $\langle \text{Lex}_L, \text{UG} \rangle$ , where  $\text{Lex}_L$  is a variable lexicon, and  $\text{UG}$  is a fixed Universal Grammar, then we can restate the Compounding Parameter as in (8).

(8) **Compounding Parameter** (revised):

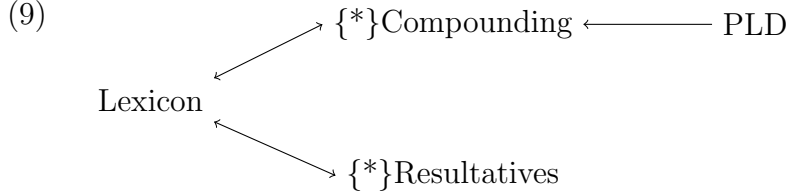
The lexicon of an I-language,  $L$ , is such that principles of  $\text{UG}$  {disallow\*, allow} formation of endocentric compounds during a syntactic derivation in  $L$ . [\*unmarked value]

From this formulation, the next step is to investigate exactly how endocentric compounds are derived syntactically and how they might be blocked. If this investigation is done by holding the principles of  $\text{UG}$  constant, then we will have arrived at a characterization of those properties of the lexicon that are linked to the Compounding Parameter.

The second line of inquiry will investigate resultative structures directly, how they are derived, and how they are blocked. As with the first line of inquiry, the goal of this line will be to identify the lexical properties that determine whether or not a given I-language generates resultatives. If the correlation between compounding and resultatives is not a coincidence, the properties identified by this line of inquiry should be identical to those identified by the first line of inquiry.

The situation I hope to describe, schematized below in (9), will be a class of lexicons defined by a single shared property or set of properties which is associated in principle with both endocentric compounding (making it learnable from the  $\text{PLD}$ ) and adjectival resultatives.

In the remainder of this section, I expand on the methodology I will employ in my thesis. First, I discuss argument sharing and causativity which, taken together, give us resultatives. Next, I use the results of this discussion to present a structural analysis of resultatives. Finally, I introduce Chomsky’s (2013; 2015) Label Theory along with some



auxiliary hypotheses which will guide my overall investigation.

## 2.1 Sharpening the Question

A more precise definition of resultatives is needed in order to proceed with this study. Resultative clauses contain two distinct predicates ( $\text{Pred1} \neq \text{Pred2}$ ) which share an argument, in which the primary predicate is construed as the cause of the secondary. Each of these properties that define resultatives (argument sharing and “causativity”) is quite common and neither one is sufficient to permit adjectival resultatives. Depictives such as those in (10), which seem to occur in all languages, show argument sharing without “causativity”.

### (10) Depictives

- a. Mary left angry. (Mary was angry.)
- b. Bill ate the fish raw. (The fish was raw.)
- c. Jamie swam the race naked. (Jamie was naked.)

So, the clause *Mary left angry* means that the two eventualities, the event  $e$  of Mary leaving and the state  $s$  of Mary being angry, stand in either a spatiotemporal identity ( $e = s$ ) or spatiotemporal containment ( $e \leq s$ ) relation rather than a causal relation.

“Causativity”, broadly construed, is even more prevalent in language. Every instance of a sentence with an agent encodes “causativity”. For example, the clause *John ironed the shirt* means that John acted in such a way as to cause the shirt to be ironed.

English-type languages, then, generate clauses in which a single argument is shared between two predicates which are in a “causative” relation. French-type languages, on the other hand, do not generate clauses with both properties. This means that an explanation of the parametric split between English- and French-type languages needs three components. First, it requires a theory of argument sharing. Second, it must include a theory of how a causative relation between predicates is established. Finally, it must show that, for a given language, there is some component of the primary linguistic data which determines whether the two phenomena (argument sharing and “causativity”) are compatible.

### 2.1.1 What is Argument Sharing

First, Lets consider cases of argument sharing, which, semantically speaking, is a situation in which one entity is interpreted as being a participant in multiple distinct eventualities expressed by a single utterance. A familiar type of argument sharing is control sentences such as (11), in which Alice is both the holder of the wanting attitude and the agent of the non-actual winning event.

(11) Alice<sub>*i*</sub> wants *ec<sub>i</sub>* to win.

Other instances of argument sharing are seen in parasitic gaps, and depictives as in (12) and (13), respectively.

(12) Who<sub>*i*</sub> did you discuss *ec<sub>i</sub>* without meeting *ec<sub>i</sub>*?

(13) Monica left angry.

$\Theta$ -roles are the syntactic analogue of the semantic predicate-argument relation. If an entity is semantically interpreted as the argument of a predicate, then the phrase that encodes that entity is  $\Theta$ -marked by the head or phrase that encodes the predicate. Under a basic minimalist assumption – the Theta-Role Assignment Principle (TRAP) (Hornstein, Nunes, and Grohmann 2005) –  $\Theta$ -roles are assigned upon merge, and, under a more controversial assumption – the Uniformity of Theta Assignment Hypothesis (UTAH) (Baker 1988)– there is a mapping between  $\Theta$ -roles and syntactic positions. This means, for example, that a DP is interpreted as the Theme of a verb iff it is merged as the complement of that verb.

I will be making two non-standard assumptions about  $\Theta$ -roles. First, I assume that DPs can receive multiple  $\Theta$ -roles, or in other words, I do not assume the  $\Theta$  criterion. This assumption is the basis for Hornstein’s (1999; 2009) Movement Theory of Control, and the justifications I discuss below are adapted from Hornstein’s justifications. There are two justifications for this assumption, one metatheoretical and the other theoretical. The metatheoretical argument is based on the method of theory building that characterizes the minimalist program. Theories are built by identifying virtual conceptual necessities (VCNs) which are taken to be axioms of the theory. A proposed principle or theoretical construct can be admitted to the theory in one of two ways: Either it is shown to follow logically from VCNs or it is argued to be a VCN. In current syntactic theory, the set of VCNs is restricted to a lexicon, a structure building operation (merge) and the interfaces with other cognitive modules (the sensorimotor and conceptual-intentional interfaces). Since the  $\Theta$ -criterion is

not a member of this set, its existence, rather than its nonexistence, must be argued for. In other words, the burden of proof is on those who would propose the  $\Theta$ -criterion rather than those who reject it.

The  $\Theta$ -criterion was originally proposed as a constraint in GB syntax that held at D-Structure. It stated that every  $\Theta$ -role must be assigned to exactly one argument and every argument be assigned exactly one  $\Theta$ -role. Since D-Structure has been eliminated from the theory, then if the  $\Theta$ -criterion does hold, it must hold at one of the interfaces, and since  $\Theta$ -roles are essentially semantic it would presumably hold at the CI-interface. We must, therefore, ask how the  $\Theta$ -criterion would be formulated as a constraint on CI legibility.

To do so, let's consider a concrete case. Compare the two possible structures for an instance of control in (14).

- (14)    a.    Richard<sub>*i*</sub> wanted [PRO<sub>*i*</sub> to laugh].  
           b.    Richard<sub>*i*</sub> wanted [ $\langle$ Richard<sub>*i*</sub> $\rangle$  to laugh].

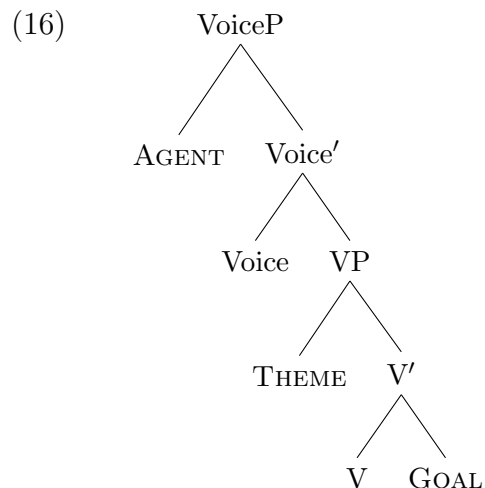
The structure in (14-a), with PRO, obeys the  $\Theta$ -criterion, and the one in (14-b) violates it, but both map to the same logical form, given in (15).

- (15)     $\exists e[\text{Wanted}(e)(\mathbf{r}) \& \text{Laugh}(e) \& \text{AGENT}(e)(\mathbf{r})]$

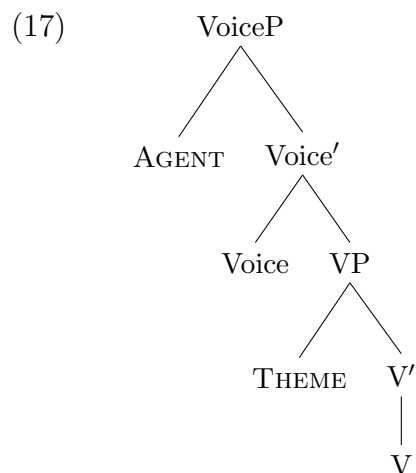
The  $\Theta$ -criterion would then amount to a stipulation that (14-a) is good and (14-b) is bad. So far, I have found no need for such a stipulation.

The second non-standard assumption is the particular version of UTAH I use. Baker (1988) argues for the following mapping of  $\Theta$ -roles to structural position. Agents are associated with [Spec Voice], Themes with [Spec V], and Goals with [Comp V] as in (16), below.





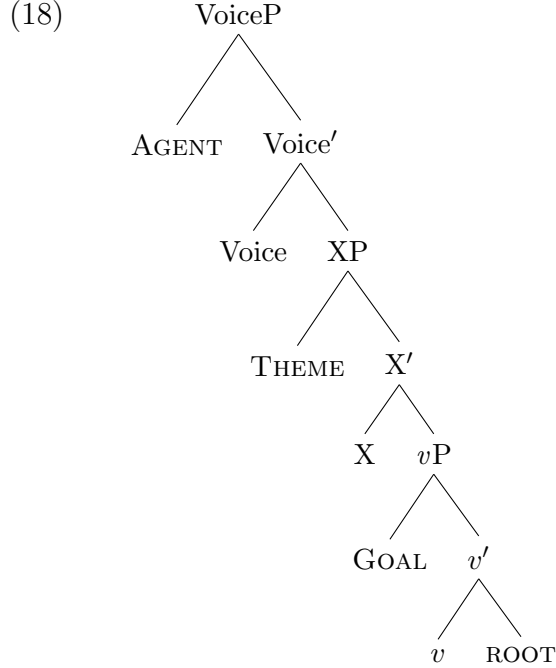
This analysis, however, assumed a theory of phrase structure in which a phrase can have an empty complement but a filled specifier. Consider the Baker-style structure of a simple transitive with only an agent and a theme, given in (17).



In a merge-based syntax, such a structure is impossible, as every instance of merge combines exactly two items, thus ruling out non-branching nodes. The structure we would expect would place the theme as the complement of V, which would have no specifier, thus violating Baker’s UTAH. Furthermore, Baker’s UTAH is problematic given the growing consensus that “lexical heads” are in fact decomposable into acategorial roots and category-determining heads. So  $V^\circ$  in (16), would actually be  $vP$  or  $v'$ , which means that Baker’s Goal argument would be in  $[\text{Spec } v]$  and another functional head would be required to introduce the Theme argument as in (18).<sup>2</sup>

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<sup>2</sup>This assumes that Roots don’t select arguments



I will make the simplifying assumption that theme arguments are merged with a projection of  $v$  (*i.e.*, in [Spec  $v$ ]) and goals are introduced in an adjunct phrase.

( Note that, although I assume that lexical categories are derived from roots and category-determining heads, I will use the old-style category notations interchangeably with the new-style notations in order to simplify my tree diagrams. This means that  $V^\circ$  is equivalent to  $[v, \text{ROOT}]$ . )

**Absolute vs Relative UTAH** In the discussion above, I have been assuming an absolute version of UTAH (AUTAH), according to which, there is a strict mapping between  $\Theta$ -roles and  $\Theta$ -marking heads. In other words, an argument  $A$  receives  $\Theta$ -role  $X$  iff it merges with (a projection) of a head  $B$ . A relative version of UTAH (RUTAH) has also been proposed in the literature (Larson 1990, *inter alia*). According to RUTAH there is a thematic hierarchy, given in (19), which determines an argument's  $\Theta$ -role relative to that of other arguments.

(19) AGENT > THEME > GOAL > OBLIQUE (Larson 1990)

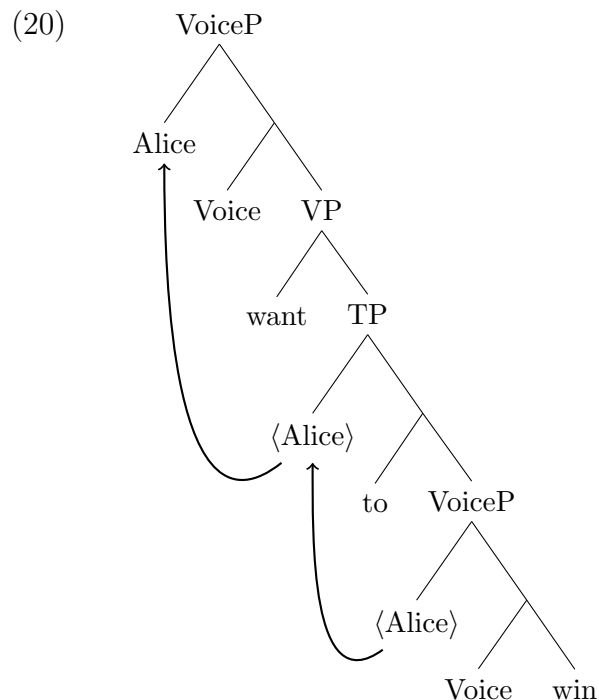
According to Larson's (1990) RUTAH the thematic hierarchy corresponds to an asymmetric c-command hierarchy of arguments in a given clause. This means that themes cannot asymmetrically c-command agents, goals cannot asymmetrically c-command themes, etc.

There is evidence for both hypotheses, which is to say that there is no empirical reason to choose one over the other. There are, however, theoretical reasons to privilege an AUTAH

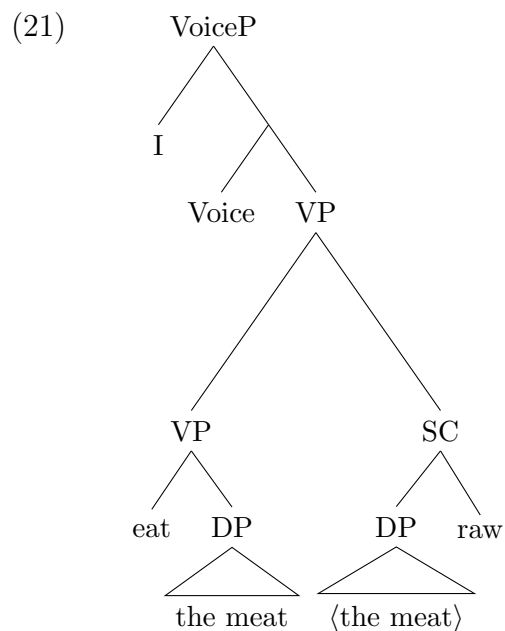
over RUTAH. Reiterating the discussion of the  $\Theta$  criterion above, minimalist theorizing starts with VCNs (a lexicon, merge, and the SM and CI interfaces) and admits other components only if they are absolutely required. So, when evaluating the two types of UTAH theoretically, the one that requires less modification of our set of VCNs should be privileged.

Both hypotheses would have to lexically specify which heads are  $\Theta$ -markers and which are not. That is, they would specify that Voice  $\Theta$ -marks but C does not. AUTAH would require that the CI interface be able to distinguish whether an argument was merged with VoiceP or with  $v$ P, and this is something we would require of the CI interface anyway. RUTAH would require everything that AUTAH requires, and also that the CI interface be able to keep a record of  $\Theta$ -marking as it interprets a structure. This means that when the CI interface is interpreting a [DP  $v$ P] structure, it must be able to consult its history and see whether a [DP, VoiceP] structure has already been interpreted. It is not obvious that such an ability is independently required of the CI interface, therefore RUTAH requires an unmotivated modification of the CI interface. Since RUTAH requires more modification of our theory than AUTAH does, it is theoretically dispreferred.

**Sideward movement** This leads to a conception of argument sharing, according to which DPs are shared arguments iff they are merged in two  $\Theta$  positions in the course of a single derivation. For ordinary control sentences, this is easy to represent. Consider (11), above, in which the subject *Alice* bears two  $\Theta$ -roles: External argument of *want* and external argument of *win*. Assuming that external  $\Theta$ -roles are assigned to DPs merged in [Spec Voice], this means that *Alice* was merged in two distinct Voice projections. This can be attained by a derivation including only standard upward movement operations as shown below in (20).



Other instances of argument sharing, however, require movement into internal argument positions. Assuming internal  $\Theta$ -roles are assigned in Comp V, this kind of argument sharing must be sideward movement. Consider the depictive sentence *I ate the meat raw*, represented below in (21).



While sideward movement is not usually assumed to be allowed in merge-based derivations, certain interpretations of minimalist syntactic theory do allow it (Hornstein 2009; Nunes

2001). I adapt these interpretations slightly to allow for the sideward movement necessary for movement to theme position.

Following Hornstein (2009) and Nunes (2001), I assume that in addition to whatever operations are specific it, the faculty of language also has access to operations which are required for general cognition, specifically, a copying operation. Furthermore, I make the assumption that phrasal elements which are merged with the clausal spine (*i.e.*, arguments and adjuncts) are derived separately from the clausal spine. A copying operation, along with the necessary assumption that subtrees are derived separately before being merged together, gives us sideward movement.

To see how this works, consider the derivation of (21) (given in (22), below). Starting with the DP *the meat* preconstructed, we build the small clause (a-c). We then select the verb from the lexical array (c), copy the DP from the small clause (d), and merge the two to form the VP (e). Finally, we merge the VP and the small clause (f) and we are left with a sideward movement structure.

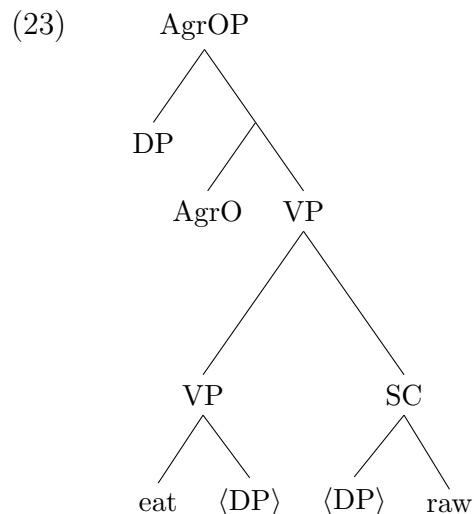
(22) **Deriving (21)**

	Lexical Array	Workspace	
(a)	$\{raw, eat, \dots\}$	$\{[_\alpha the, meat]\}$	Select(raw)
(b)	$\{eat, \dots\}$	$\left\{ \begin{array}{l} raw, \\ [_\alpha the, meat] \end{array} \right\}$	Merge(raw, $\alpha$ )
(c)	$\{eat, \dots\}$	$\{[_\beta raw, [_\alpha the, meat]]\}$	Select(eat)
(d)	$\{\dots\}$	$\left\{ \begin{array}{l} eat, \\ [_\beta raw, [_\alpha the, meat]] \end{array} \right\}$	Copy( $\alpha$ )
(e)	$\{\dots\}$	$\left\{ \begin{array}{l} eat, \\ [_\gamma the, meat], \\ [_\beta raw, [_\alpha the, meat]] \end{array} \right\}$	Merge(eat, $\gamma$ )
(f)	$\{\dots\}$	$\left\{ \begin{array}{l} [_\delta eat, [_\gamma the, meat]], \\ [_\beta raw, [_\alpha the, meat]] \end{array} \right\}$	Merge( $\delta$ , $\beta$ )
(g)	$\{\dots\}$	$\{[_\zeta [_\delta eat, [_\gamma the, meat]], [_\beta raw, [_\alpha the, meat]]]\}$	

As discussed by Nunes (2001), the derivation in (22) and the structure it derives in (21) would lead to a crash at PF due to a failure of copy deletion. Assuming that, all else being equal, the higher copy of a syntactic object is pronounced and lower copies are deleted, a sideward movement structure ought to be unpronounceable. If sideward movement is

followed by movement to a position that c-commands both copies, then the copy deletion issues evaporate, and the higher copy is pronounced.

Returning to the specific example of object-oriented depictives, the preceding discussion means that the structure in (21) cannot be the final structure of the sentence given, as such a structure is unpronounceable, as neither DP copy c-commands the other. If we assume, following Lasnik and Saito (1999), that grammatical objects raise to Spec AgrO<sup>3</sup> for abstract Case<sup>4</sup> licensing, then our sideward moved DP must raise. Since Spec AgrO c-commands both lower copies of the DP, our pronunciation issue is solved.



To summarize, argument sharing is represented in the syntax by movement from one  $\Theta$  position to another. In canonical control constructions, this is a trivial upward movement operation. In other argument sharing constructions, however, sideward movement is necessary and the result requires a further upward movement to a position that c-commands all other instances of the moved element.

### 2.1.2 What is “Causativity”?

Consider the causative-inchoative alternation demonstrated in (24) and (25).

(24) The toast burned.

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<sup>3</sup>It seems unlikely to me that there is a specialised grammatical category whose only property is that it licenses Object DPs. As such I assume AgrO to be some meaningful category, but I take no stance at this time on what that category might be.

<sup>4</sup>I take abstract Case to be a phenomenon in need of explanation, rather than an explanation for a phenomenon.

(25) Paul burned the toast.

A theory of causativity must explain the intuition that (25) entails (24). Broadly speaking, there are two types of theories of causativity: those that propose that (25) is, in some sense, derived from (24), and those that say it isn't. For a derivational theory (e.g. Hale and Keyser 1993; Lakoff 1976; Pietroski 2003), there is one lexical entry, BURN and two forms, *burn*<sub>1</sub> and *burn*<sub>2</sub>, derived from it. For a non-derivational theory (e.g. Fodor 1970), there are two lexical entries, BURN<sub>1</sub> and BURN<sub>2</sub>, which are stipulated to stand in an entailment relation ( $x$  BURN<sub>2</sub>  $y \rightarrow y$  BURN<sub>1</sub>) and are homonymous.

I will adopt a derivational theory based on the semantic analysis of causativity developed by Pietroski (2003).<sup>5</sup> This analysis assumes a Neo-Davidsonian semantics, according to which (24) describes an event of burning which the toast is the theme of, as formalized in (26).

(26)  $\exists e[\text{Burning}(e) \ \& \ \text{THEME}(e, \text{the\_toast})]$

The causative alternant, describes a complex event ( $f$ ) which terminates<sup>6</sup> in a toast burning event( $e$ ) and has John as an agent, as formalized below in (27).

(27)  $\exists e, f[\text{AGENT}(e, \text{paul}) \ \& \ \text{TERMINATES-IN}(e, f) \ \& \ \text{Burning}(f) \ \& \ \text{THEME}(f, \text{the\_toast})]$

In order to discuss how causativity might be derived syntactically, let's consider the pieces required. Starting with the inchoative as a basis, we need a verb and a theme argument. In addition to that we need something that expresses the TERMINATES-IN and AGENT predicates, and the agent argument.

I will assume that the inchoative verb is formed by merging a root with a category-determining head. This complex merges with and  $\Theta$ -marks the theme. I will further assume, following Pietroski (2003), that the head which encodes TERMINATES-IN combines directly with the VP. I remain agnostic at this time with respect to the question of whether AGENT and TERMINATES-IN are necessarily bundled on a single head.

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<sup>5</sup>This analysis may be a notational variant of the semantic analysis given by Kratzer (2004).

<sup>6</sup>Pietroski defines termination as follows.

[E]vent  $F$  *terminates* event  $E$ , iff:  $E$  and  $F$  occur;  $F$  is a (perhaps improper) part of  $E$ ; and  $F$  is an effect of every event that is a proper part of  $E$  but is not a part of  $F$ . (Pietroski 2003, p190)

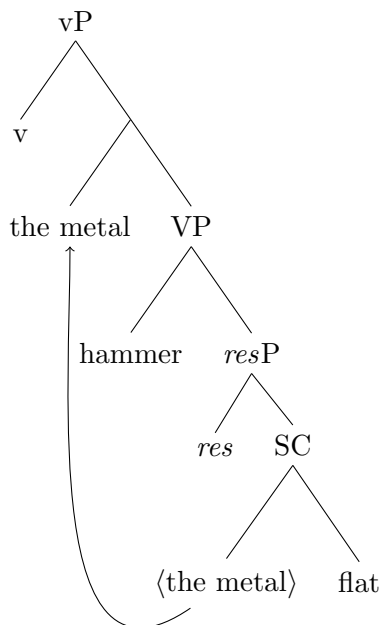
## 2.2 Enter Resultatives

Given the discussion above regarding the syntax and semantics of argument sharing and causativity, I will move on to discuss how the two notions interact to generate or fail to generate resultatives. I will discuss resultatives using (28) as a representative example.

(28) Jennifer hammered the metal flat

First, consider the analysis given by Kratzer (2004), according to which, the theme *the metal* and the adjective *flat* form a small clause, which encodes a state description. The small clause merges with a *res* head, which encodes a causative relation between events, and the resulting *resP* is merged as the complement of the verb *hammer*. The small clause theme is then raised to Spec V where it is marked as the theme of *hammer*, and from there the derivation proceeds as normal. The vP this generates is given in (29).

(29) Kratzer's Resultative Structure



Semantically, this proposal depends on a standard montagovian theory of composition (see Heim and Kratzer 1998) and a neo-davidsonian event semantics with two novel notions: a refined definition of a CAUSE predicate and a novel rule of composition. The CAUSE predicate defines a relation between events *e* and *f* where *e* is an event of causing *f*. As Kratzer defines causality, the CAUSE predicate may be equivalent to Pietroski's TERMINATES-IN predicate,



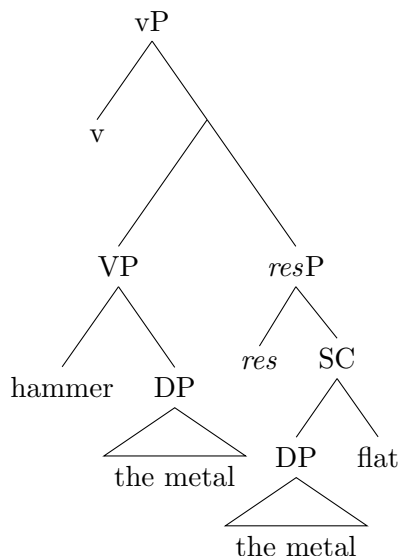
and if so, no more needs to be said about it.

Kratzer requires a novel rule of composition because the *resP* (type  $\langle s, t \rangle$ ) is neither of the same type as, nor in the domain of the verb (type  $\langle e, \langle s, t \rangle \rangle$ ) it combines with. To combine these objects, Kratzer uses the rule of *event identification* (Kratzer 1996) as defined in (30).

- (30) **Event Identification:** If  $\alpha$  is a branching node with daughters  $\beta$  and  $\gamma$ , and if  $\beta$  is of type  $\langle e, \langle s, t \rangle \rangle$  and  $\gamma$  is of type  $\langle s, t \rangle$ , then  $\llbracket \alpha \rrbracket = \lambda x_e \lambda e_s [\llbracket \beta \rrbracket (x)(e) \& \llbracket \gamma \rrbracket (e)]$

Given the discussion above regarding argument sharing, however, I will modify Kratzer's syntactic analysis slightly. In the modified analysis, the theme moves sideward from the small clause to Comp V, and the ResP merges with the VP, as shown below in (31).

- (31) Kratzer + Sideward movement



In this thesis I will investigate the structure in (31), asking how it might be barred in one language and allowed another. I will do so by comparing resultative structures with structures such as depictives which seem to be found in all languages. Given modern syntactic theory, according to which the narrow syntactic module is purely free merge, a refined theory of the interfaces is required to explain the fact that structures such as (31) are allowed or disallowed in a given language. In the following section, I argue that Label Theory (Chomsky 2013, 2015) provides the framework for such a theory.

## 2.3 Label Theory

I will be assuming and extending Chomsky’s (2013; 2015) Label Theory, which begins with two principles: (i) Merge does not assign labels to the objects it creates, and (ii) labels are required for proper interpretation at the CI interface. From these principles, Chomsky proposes that labels are assigned upon transfer (*i.e.*, at the phase level) to the CI interface by a special case of minimal search: the labeling algorithm (LA). The LA picks out the most prominent element contained in a syntactic object and assigns it as the label of that syntactic object. Given this conception of labeling, there are three relevant classes of syntactic objects: (i) Head-Phrase structures ( $\{X, YP\}$ ), (ii) Head-Head structures ( $\{X, Y\}$ ), and (iii) Phrase-Phrase structures ( $\{XP, YP\}$ ).<sup>7</sup> The simplest case, Head-Phrase structures, require no special discussion. The head is the most prominent constituent of the structure, so it becomes the label.

$$(32) \quad \text{Label}(\{X, YP\}) = X$$

The other structures are symmetric, and therefore do not necessarily have a most prominent element. The LA, therefore, must use other factors to decide. Head-Head structures can only be labeled if only one of the heads can be the label. Chomsky notes that the only instances of licit (and therefore labelable) Head-Head structures are the result of merging a root with a category-determining head, and proposes that this is because roots are simply unable to be labels.

$$(33) \quad \text{Label}(\{X, Y\}) = X \text{ iff } Y \text{ is a root and } X \text{ is not a root.}$$

The last case, and the one most relevant to this dissertation, is the class of Phrase-Phrase structures. Like the Head-Head structures, these are symmetrical, so there is no single most prominent element to be found. Since every instance of internal merge, as well those instances of externally merging arguments, creates a Phrase-Phrase structure, there must be some way of labeling these structures. Chomsky proposes two labeling strategies: (i) Lower copies of phrases are invisible to labeling, and (ii) if the two phrases agree for some feature, that feature can itself act as a label.

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<sup>7</sup>Technically speaking, there is a fourth class of syntactic objects, Heads, which I will not discuss for two reasons. First, it is not clear that heads would require labels. And second, if they do, the labeling process would be trivial.

$$(34) \quad \text{Label}(\{XP, YP\}) = \begin{cases} \text{Label}(YP) & \text{iff } XP \text{ is a lower copy} \\ \langle F, F \rangle & \text{iff } XP \text{ and } YP \text{ agree for } F \end{cases}$$

Recall that Chomsky proposes that labeling is a requirement of the CI interface. It should be (and has been) noted, however, that, given our current conception of the CI interface, there is no a priori reason to think that labelling is required for semantic interpretation (see *e.g.*, Hornstein 2016). If a Phrase-Phrase structure has the proper semantic types, then why does it need a label? Our current conception of the CI interface, however, is based on questionable assumptions regarding the status of natural language as a formal language, and the role of truth-conditions and reference in natural language meaning. Specifically, the current theory of natural language semantics assumes (i) that natural languages are formal languages (Montague 1970), (ii) that words refer to extra-mental entities, and (iii) that the meaning of a natural language sentence is its truth conditions Heim and Kratzer (1998). The validity and utility of these assumptions has been repeatedly challenged by linguists and philosophers (Chomsky 2000; Hornstein 1984; Moravcsik 1998; Pietroski 2005). I, therefore, take the nature of the CI Interface to be an open question, to which Chomsky’s label theory offers a partial answer. Label theory, then, is not a theory of the Narrow Syntax, so much as it is a theory of the CI interface.

Beyond the theoretical arguments in favour of label theory, there are practical reasons to believe that it will provide an explanation of the parametric variation to be investigated in this thesis. Older theories of movement, such as Last Resort, offered conditions on movement *to* a given structural position, but no conditions of movement *from* a given position.<sup>8</sup> The observation by Rizzi (2015, and elsewhere) that phrases cannot move from so-called criterial positions, however, suggests that our theory of movement must include conditions on movement *from*, in addition to conditions on movement *to*. For instance, (35) unacceptable because *which book* cannot move from its criterial position in the lower [Spec Q].

(35) \*Which book  $\emptyset_Q$  do you wonder  $\langle$ which book $\rangle \emptyset_Q$  he read.

Chomsky (2015) presents an account of criterial freezing in terms of labeling, and thus shows that label theory offers conditions on movement *from*.

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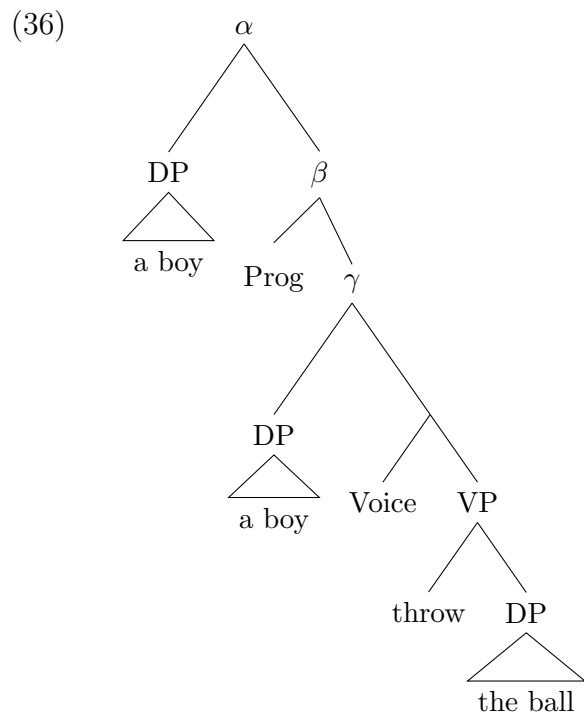
<sup>8</sup>This will to be fleshed out in the my thesis.

### 2.3.1 Labels, Adjuncts, and Interpretation

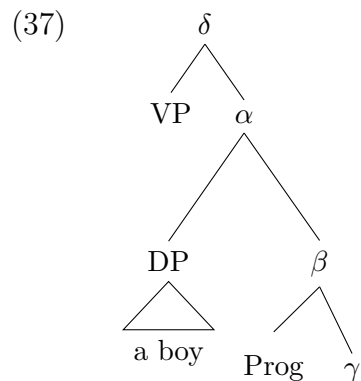
I will expand Chomsky’s label theory with two auxiliary hypotheses. The first, which I borrow from Chametzky (1996) and Hornstein (2009), is that adjunct-base structures are by definition unlabeled. That is, an  $\{XP, YP\}$  structure is an adjunct-base structure iff  $\text{Label}(\{XP, YP\}) = \emptyset$ . The second hypothesis is that the label of a complex syntactic object determines how it is interpreted compositionally. That is, an  $\{XP, YP\}$  structure is interpreted differently depending on whether its label is  $\emptyset$ ,  $\langle F, F \rangle$ , or  $\text{Label}(XP)$ . When the structure is unlabeled, it is interpreted as a conjunction structure.

The empirical utility of these assumptions has already been demonstrated in Milway (2016). I use them to explain the fact that specifiers of adjuncts must move even if their position would otherwise be criterial. In particular I presented an investigation of the subjects of adjunct ACC-ing clauses, which is summarized below.

Consider the ACC-ing clause *a boy throwing the ball*, the structure of which is given in (36), prior to being adjoined to a base.



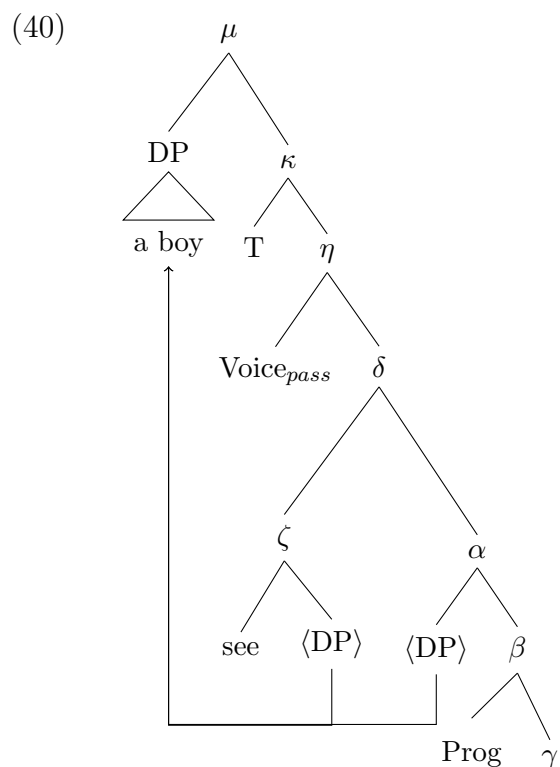
Since the complement of Prog,  $\gamma$ , receives its normal interpretation, I assume it is transferred and labelled before the ACC-ing clause is adjoined. This leaves  $\alpha$  and  $\beta$  unlabeled, and when the clause is adjoined to a VP, they remain unlabeled.



- (38)
- a.  $\text{Label}(\delta) = \emptyset$
  - b.  $\text{Label}(\alpha) = \emptyset$

This derivation correctly predicts that  $\delta$  is interpreted as a conjunction structure, but incorrectly predicts that  $\alpha$  is interpreted that way too. If, however, *a boy* moves out of  $\alpha$  before adjunction occurs, as in (40), then  $\alpha$  does not receive a deviant interpretation.

(39) A boy was seen throwing the ball.



## 2.4 Summary

In the preceding section I have proposed a methodology for linking a surface parameter ( $\{*\}$ compounding) with an interpretive one ( $\{*\}$ resultatives) which takes the Borer-Chomsky Conjecture as a core assumption. I then discussed the two necessary facets of resultatives: Argument Sharing and Causativity. Argument Sharing of the type required by resultatives requires a rejection of the  $\Theta$ -criterion and an acceptance of sideward movement. Causativity is a causal relation between Neo-Davidsonian events which is encoded by a functional head,  $res^\circ$ . I then put these two facets together to arrive at a structural analysis of resultatives. Finally, I introduced Chomsky’s Label Theory and two auxiliary hypotheses regarding labeling. In what follows I will apply the concepts discussed above to the problem of the resultative parameter and give a sketch of how the parameter might be explained.

## 3 A Preliminary Explanation of the Resultative Parameter

I will assume that the bareness of a given category in a language determines whether that category can take part in productive compounding in that language. So, in English, German, Norwegian, *etc.* adjectives are sometimes bare, while in French, Italian, Spanish, *etc.* they always carry unvalued features.<sup>9</sup> The lexical property that I will identify, then, is the availability of a category-determining  $adj^\circ$  head without  $\varphi$ -features. This, I believe, will yield an explanation of the resultative parameter.

The explanation of the resultative parameter that I will pursue is similar in logic to the explanation I give for the distribution of ACC-ing subjects (Milway 2016, as discussed above in section 2.3.1). The basic premises of this explanation are as follows. (i) The VP-*res*P structures in question are adjunction structures (*res*P adjoined to VP), (ii) specifiers of adjuncts must move, for reasons discussed in Milway (2016), and (iii) complements of adjuncts are labeled before adjunction occurs.

In a language such as German, then, resultatives are derived first by merging the theme DP with the bare adjective ( $[adj_\emptyset^\circ, \text{ROOT}]$ ), and then merging  $res^\circ$ .

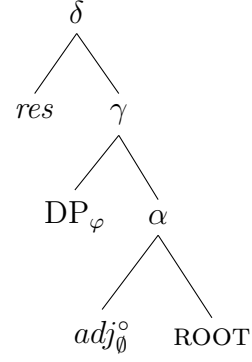
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<sup>9</sup>Note that this proposal is similar to Lasnik’s (1999) analysis of verbal morphology in English and French.

$$(41) \quad 1. \text{Merge}(\text{adj}_{\emptyset}^{\circ}, \text{ROOT}) = \alpha$$

$$2. \text{Merge}(\text{DP}_{\varphi}, \beta) = \gamma$$

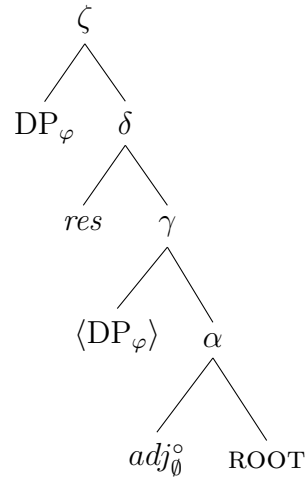
$$3. \text{Merge}(\text{res}^{\circ}, \gamma) = \delta$$



$$(42) \quad \text{Label}(\gamma) = \text{undefined}$$

If this object were to be adjoined to a VP at this point, the small clause would be unlabelable, and the derivation would crash. This is why the DP must raise to merge with the *res*P, which is now fully labelable, as shown in (43).

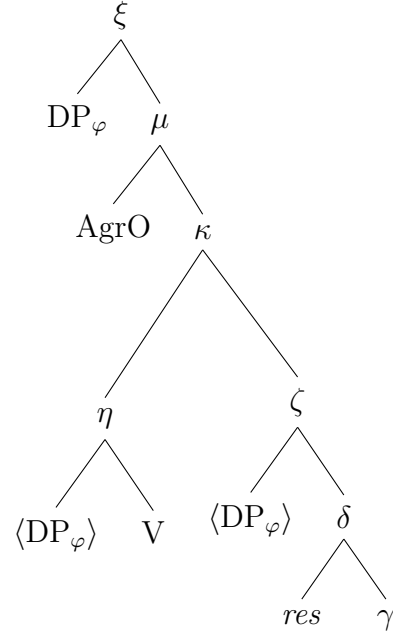
$$(43) \quad 4. \text{Merge}(\text{DP}_{\varphi}, \delta) = \zeta$$



$$(44) \quad \text{Label}(\gamma) = \text{Label}(\alpha) \text{ (by labeling rule (34))}$$

If we adjoin the resulting object to the VP at this point, the theme DP, being the specifier of an adjunct, will have to move to [Comp V] and then to [Spec AgrO], as shown in (45).

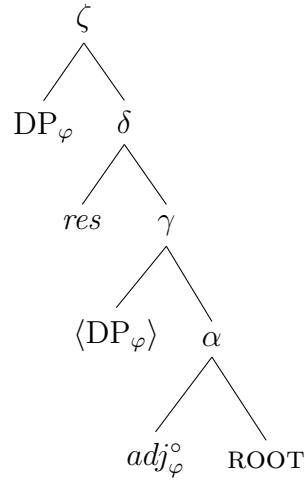
- (45)
5.  $\text{Transfer}(\gamma)$
  6.  $\text{Copy}(\text{DP}_\varphi)$
  7.  $\text{Merge}(\text{DP}_\varphi, \text{V}) = \eta$
  8.  $\text{Merge}(\eta, \zeta) = \kappa$
  9.  $\text{Merge}(\text{AgrO}, \kappa) = \mu$
  10.  $\text{Merge}(\text{DP}_\varphi, \mu) = \xi$



We thus have a convergent derivation of an adjectival resulative.

Consider how the above derivation would proceed in a language like French, with obligatory  $\varphi$ -features on  $\text{adj}^\circ$ , as demonstrated in (46). The theme DP will merge with the feature-bearing adjective ( $[\text{adj}^\circ_\varphi, \text{ROOT}]$ ) to form a small clause. The small clause then merges with *res*, and the DP raises to  $[\text{Spec } \text{res}]$ . When the complement of *res* is transferred, the small clause will not be labelable since the DP controlling *adj*P's agreement will be invisible to LA and *adj* is too weak to label on its own.<sup>10</sup>

- (46)
1.  $\text{Merge}(\text{adj}^\circ_\varphi, \text{ROOT}) = \alpha$
  2.  $\text{Merge}(\text{DP}_\varphi, \beta) = \gamma$
  3.  $\text{Merge}(\text{res}^\circ, \gamma) = \delta$
  4.  $\text{Merge}(\text{DP}_\varphi, \delta) = \zeta$
  5.  $\text{Transfer}(\gamma)$
  - \*CRASH\*



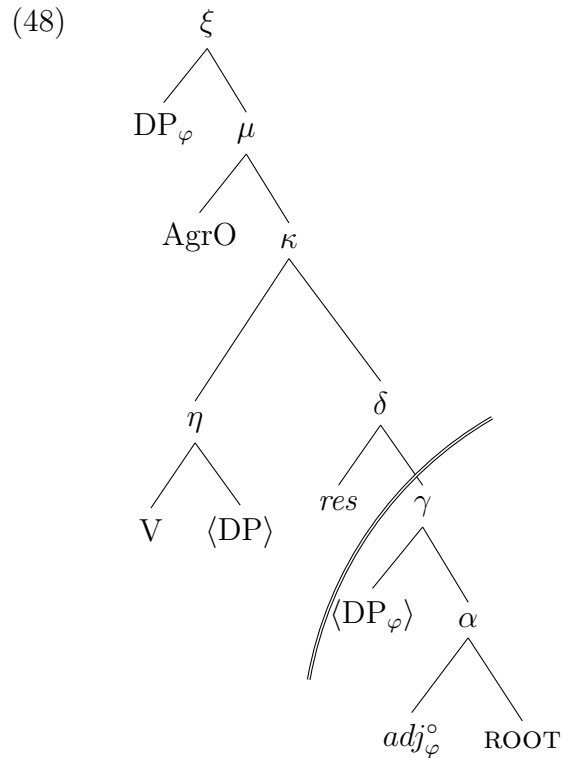
- (47)  $\text{Label}(\gamma) = \text{Undefined}$

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<sup>10</sup>Compare Chomsky's (2015) treatment of T in English.



If the theme DP does not raise to [Spec *res*], our small clause will be labelable, but we will still be unable to derive a resultative clause. In order to derive a resultative, the theme DP must be interpreted in both the small clause and the VP. This means that the theme DP must merge with the verb and subsequently raise to object position. The resulting structure, given in (48), will not be linearizable.



In order to linearize the structure, all but one copy of the DP must be deleted. In order to be deleted, an object must form a chain with one of its copies. The DP copy in the small clause of (48), however, is inside an adjunct island and therefore cannot form a chain with the DP copy in [Spec AgrO]. Since it cannot form a chain, it cannot be deleted. This causes a crash at the SM interface.

So, there seems to be no derivation of adjectival resultatives that converges if  $adj_\varphi^\circ$  bears unvalued  $\varphi$ -features. Provided my assumption regarding the link between compounding and bareness is correct, then, we have an explanation of how  $\{*\}$ compounding is linked to  $\{*\}$ resultatives.

### 3.1 Directions to Extend

Assuming the explanation sketched above is correct for adjectival resultatives, three related phenomena must be specifically addressed: directionalized locatives, Norwegian and Icelandic resultatives, and depictives. This will likely occupy the later parts of my thesis.

In my first generals paper (Milway 2015) I argue that directionalized locatives, demonstrated in (49), are resultatives with PP secondary predicates, and should therefore be explained in the same way as adjectival resultatives.

- (49) The ball rolled between the pylons.  
 ( $\approx$  the ball rolled TO between the pylons.)

Extending my account of adjectival resultatives to directionalized locatives, however, presents two difficulties. First, the surface variation associated with  $\{*\}$  directionalized locatives seems to be  $\{*\}$  particle verbs. As such, an analysis of particle verbs must be given that crucially requires “bareness” of  $P^\circ$ . Second, while the directionalized locative parameter is generally linked to the resultative parameter, there seem to be cases in which the two are disassociated. For instance, Ruth King and Yves Roberge (p.c. to Rooryck 1996) report that P.E.I. French allows directionalized locatives but not resultatives.

Norwegian and Icelandic are problematic for the account I offer due to the fact that their resultative adjectives show agreement with the theme argument.

- (50) Vi vaska golvet reint (Norwegian Kratzer 2004)  
 We washed the.floor(Nt) clean.Nt  
 “We washed the floor clean.”
- (51) Ég kýldi lögguna kalda. (Icelandic Whelpton 2007)  
 I.NOM punched the.cop.FemSgACC cold.FemSgACC  
 “I punched the cop out cold.”

This is problematic since my account requires *adj*P’s in resultatives to be bare. If, however, the source of the agreement morphology is *res* $^\circ$  rather than *adj* $^\circ$ , the account can be saved. Such a move would have to be justified, though.

Finally, I will discuss depictives, which I assume have a similar structure to that of resultatives, but do not seem to show parametric variation. I will have show, for instance, that my account allows depictives in English and does not rule them out in French.

## 4 Appendices

- Milway, Daniel (2013). *Pulling up grounds and holding figures back: On the syntax and semantics of ground promotion and figure retention particle verbs*. Unpublished MA Forum paper. University of Toronto.
- (2015). *Directionalized locatives: A label theoretic account*. Unpublished generals paper. University of Toronto.
- (2016). “Subjects of Adjuncts and Labeling”. Presented at the Dog Days syntax workshop. University of Toronto.

## 5 Timeline:

- Early Dec 2017: Full Draft to committee
- Early Feb 2018: Revised Draft to committee
- Mid-Feb 2018: Defense Draft to committee
- Mid-Apr 2018: Defense

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# Pulling up grounds and holding figures back

On the syntax and semantics of ground promotion and  
figure retention particle verbs

Daniel Milway

MA Forum Paper

October 10, 2013





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There are also a number of people who, without knowing it, helped me survive this hectic year, by making podcasts which informed me, made me laugh, and in a few cases genuinely inspired me. Thank you to Scott Aukerman, Paul F. Tompkins, Kulap Vilaysack, Howard Kremer, Doug Benson, June Diane Raphael, Paul Scheer, Jason Mantzoukas, Dave Shumka, Graham Clark, Russ Roberts, Leo Laporte, Gina Trapani, Jeff Jarvis, Denis Howell and Evan Brown.

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# Contents

<b>Contents</b>	<b>iii</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Syntactic properties of PVs in English and German . . . . .	2
1.1.1 English Particle Shift . . . . .	2
1.1.2 German PVs: word order and intervening morphemes	3
1.1.2.1 Particle stranding in V2 order . . . . .	3
1.1.2.2 Intervening Morphemes . . . . .	5
1.2 Preview . . . . .	6
<b>2 About the PVs</b>	<b>7</b>
2.1 Argument Structure . . . . .	7
2.1.1 Resultative PVs (McIntyre, 2007) . . . . .	8
2.1.2 Aspectual PVs (McIntyre, 2007) . . . . .	8
2.1.3 Ground Promotion (McIntyre, 2007) . . . . .	9
2.1.4 Objects of PVs: Arguments of the verbs or the particles? . . . . .	10
2.1.5 What does it mean to be an argument? . . . . .	14
2.1.6 More on ground promotion PVs . . . . .	16
2.1.7 Summary . . . . .	17
2.2 The Underlying Structure of PVs . . . . .	18
2.2.1 PVs as complex heads . . . . .	18
2.2.2 Particles as small clause heads . . . . .	21
2.2.3 Particles as late adjuncts . . . . .	23
2.2.4 Summary . . . . .	25
2.3 Connecting the two debates . . . . .	25
<b>3 The structure of PVs</b>	<b>29</b>

3.1	Ground Promotion objects as arguments of a spatial preposition . . . . .	29
3.2	The pP . . . . .	31
3.3	The Semantics of figure/Ground PVs . . . . .	35
3.3.1	The basics . . . . .	36
3.3.2	The semantic system . . . . .	36
3.3.3	Formalizing Space: Points, Vectors, and Paths . . . .	37
3.3.4	Composing the pP and Verb . . . . .	43
3.3.5	Summary . . . . .	46
3.4	The Syntax of PVs . . . . .	46
3.4.1	English Particle Shift . . . . .	47
3.4.2	German PVs . . . . .	53
3.4.2.1	Particle Stranding . . . . .	53
3.4.2.2	Intervening morphemes . . . . .	57
<b>4</b>	<b>Residual Issues, Implications, and Conclusion</b>	<b>61</b>
4.1	Restricting the analysis to PVs . . . . .	61
4.2	The Optionality of p-to-V movement . . . . .	63
4.3	The bracketing paradox - revisited . . . . .	70
4.4	Aspectual PVs . . . . .	71
4.5	Idiomaticity . . . . .	73
4.6	Conclusion . . . . .	74
	<b>Bibliography</b>	<b>77</b>

# Chapter 1

## Introduction

Particle Verbs are a common construction Germanic languages, composed of a verb and a particle (often taking the form of a preposition) and seemingly interpreted and classified as a single lexical item. Examples (1-5) show sentences with Particle Verbs (PVs) in various Germanic languages, with particles in bold.

- (1) Yiddish (Svenonius, 2003)

Ix hob **arayn**-geschtoxn a dorn in ferd.  
I have R.in-stuck a thorn in horse

“I have stuck a thorn in a horse.”

- (2) English  
Doug looked the movie **up**

- (3) German<sup>1</sup>

Ich habe die Pfanne **ein**-geöllt  
I have the pan in-oiled

“I oiled the pan.”

- (4) Afrikaans (Svenonius, 2003)

...die hef van 'n mes **uit**steek.  
the handle of a knife out.stuck

“... the handle of a knife stuck out.”

---

<sup>1</sup>Unless otherwise cited, German data is the result of my elicitation.

- (5) Norwegian (Svenonius, 2003)

Handtaket på en kniv stakk **ut**.  
the.handle on a knife stuck out

“A knife handle stuck out.”

The goal of this paper is to provide a structural analysis of PVs in English and German which accounts for the unique word-order effects associated with them in each language. Specifically, this paper will investigate a specific subset of PVs, ground promotion PVs, which have a particular argument structure, and attempt to answer the question asked by McIntyre (2007): “Are direct arguments arguments of verbs or particles?” I will argue, based on argument structure alternations and semantic compositionality, that ground promotion PVs are best analysed as the combination of verbs and defective prepositions, and that the object of these PVs is an argument of that prepositional element. Having shown this, I will then propose a structural account for the syntactic phenomena associated with English and German PVs described in the following section.

## 1.1 Syntactic properties of PVs in English and German

There are a few well known syntactic behaviours of PVs in English and German that any syntactic theory of PVs must to account for. This section will lay out what those phenomena are, beginning with English particle shift in section 1.1.1. After discussing English PVs, I will describe how PVs interact with German word order and inflectional prefixes in section 1.1.2.

### 1.1.1 English Particle Shift

A well known fact about English PVs is that their particles and objects show a word order alternation. This alternation, known as particle shift, has been studied within the Generative enterprise almost since its inception (Chomsky, 1957, 1975). Generally speaking, transitive PVs in English freely alternate between Verb-Particle-Object and Verb-Object-Particle.

- (6) a. Kulap turned the music **up**.  
b. Kulap turned **up** the music.

- (7) a. Howard put the jacket **on**.
- b. Howard put **on** the jacket.

The only apparent restriction on particle shift is that if the object is a pronoun, it must intervene between the verb and the particle.

- (8) a. Scott shut the computer **down**.
- b. Scott shut **down** the computer.
- c. Scott shut it **down**.
- d. \*Scott shut **down** it.

There is also a preference for larger DPs to surface after particles, as seen in (9) below.

- (9) a. Graham turned the steak down.
- b. ?? Graham turned the beautifully cooked steak that Dave cooked for him down.

An analysis of English particle verbs must, then, be able to account for both the alternation itself and the restrictions on it.

### 1.1.2 German PVs: word order and intervening morphemes

Grammars of German (Hall and Scheiner, 2001; Pribsch and Collinson, 1958) refer to PVs as “separable” verbs because, although standard German orthography represents German PVs as single words, they can be separated into particles and verbs either when the verb moves, or when some other morpheme intervenes between the two parts.

#### 1.1.2.1 Particle stranding in V2 order

German shows what is referred to as matrix verb second (V2) word order, meaning that in matrix clauses finite verbs are always the second constituent in the sentence. Non-finite verbs appear on the right edge of the clause. The choice of first constituent is free, as shown by the examples in (10).

- (10) V2 word order
  - a. Finite Lexical Verb
    - i. **S-V-O-Adv**

Die Frau **isst** einen Apfel heute.  
the.NOM woman eats an.ACC apple today.

ii. **O-V-S-Adv**

Einen Apfel **isst** die Frau heute.  
an.ACC apple eats the.NOM woman today.

iii. **Adv-V-S-O**

Heute **isst** die Frau einen Apfel.  
today eats the.NOM woman an.ACC apple.

“The woman eats/will eat an apple today.”

b. Finite Auxiliary Verb

i. **S-Aux-O-V**

Die Frau **möchte** einen Apfel **essen**.  
the.NOM woman would.like an.ACC apple eat.

ii. **O-Aux-S-V**

Einen Apfel **möchte** die Frau **essen**.  
an.ACC apple would.like the.NOM woman eat.

“The woman would like to eat an apple.”

When PVs are finite in matrix clauses, however, the verbal stem appears in V2 position, while the particle appears clause-finally. In cases where a PV is not in second position (e.g. with a finite modal auxiliary), the particle and the verb appear together in the clause final position

(11) a. Finite PV

Die Frau **isst** einen Apfel **auf**.  
the.NOM woman eats an.ACC apple PRT

“The woman is finishing the apple.”

b. Non-finite PV

Die Frau **möchte** einen Apfel **auf-essen**.  
the.NOM woman would.like an.ACC apple prt-eat

Particle stranding in German is problematic because PVs in German are considered to be single lexical items, but frequently surface separately. This phenomenon must be accounted for in any syntactic analysis of PVs.



### 1.1.2.2 Intervening Morphemes

There are two morphemes in German which intervene between the particle and its verbs. The first intervener is *ge-*, the common participle prefix, which appears in perfect constructions. When the participle is that of a particle verb, the prefix *ge-* surfaces between particle and its verb.

- (12) a. Die Frau möchte einen Apfel **essen**.  
 the.NOM woman would.like an.ACC apple eat  
 “The woman would like to eat an apple”  
 b. Die Frau hat einen Apfel **ge-g-essen**.  
 the.NOM woman AUX an.ACC apple PTPL-*g*-eat  
 “The woman ate/has eaten an apple”
- (13) a. Die Frau möchte einen Apfel **auf-essen**.  
 the.NOM woman would.like an.ACC apple PRT-eat  
 “The woman would like to finish an apple”  
 b. Die Frau hat einen Apfel **auf-ge-g-essen**  
 the.NOM woman AUX an.ACC apple PRT-PTPL-*g*-eat  
 “The woman finished/has finished an apple”

The second intervener is *zu*, which serves a similar function to the English infinitive marker *to*. That is, it appears with non finite verbs in control and raising constructions. When *zu* appears with a PV, it surfaces, like the participle morphology, between the particle and its verb.

- (14) Die Frau beabsichtigt, einen Apfel **zu essen**.  
 the.NOM woman intends an.ACC apple to eat  
 “The woman intends to eat an apple”
- (15) Die Frau beabsichtigt, einen Apfel **auf-zu-essen**.  
 the.NOM woman intends an.ACC apple PRT-to-eat  
 “The woman intends to eat an apple”

German does not otherwise exhibit infixation, yet these two morphemes, one a prefix, the other a free morpheme, are seemingly able to appear word-internally. This presents a puzzle which an account of PVs must solve.

## 1.2 Preview

This paper is organized as follows: In chapter 2 I will review the argument structure classes of PVs that McIntyre (2007) defines with a more in-depth look at the ground promotion class, and discuss some of the previous analyses for the underlying structure of PVs. Chapter 3 lays out my analysis of ground promotion PVs, followed by chapter 4 which ties up loose ends left by my analysis, and extends it to other classes of PVs, and concludes the paper.

# Chapter 2

## About the PVs

This paper contributes to two debates within the PV literature, which I will outline in this chapter. The first debate, discussed in section 2.1, is about the argument structures of PVs. In order to properly frame the debate, I will describe the common argument structure alternations associated with PVs, before discussing the debate itself. The second debate, discussed in section 2.2, concerns the underlying syntactic and lexical structure of PVs. Throughout the paper I will show that the two debates are in a position to inform each other.

### 2.1 Argument Structure

The argument structure of certain PVs differs from that their simplex counterparts. Based on their argument structural effects, PVs can be divided into three major classes: *a)* resultative, *b)* aspectual, and *c)* ground promotion McIntyre (2007), which are discussed in sections 2.1.1, 2.1.2, and 2.1.3, respectively. Section 2.1.4 introduces the debate surrounding the argument structures of PVs, as discussed by McIntyre (2007), and reframes it in terms which are more amenable to a rigorous investigation. I argue that some of the puzzles which give rise to the debate surrounding the argument structure of PVs persist because of differences between the classes of PVs that McIntyre describes. Therefore, I argue, it is more fruitful to analyse a single class of PVs. This paper will focus on ground promotion PVs because, unlike many of the other PVs, they have a relatively transparent meaning, which is that of spatial prepositions, a relatively well studied part

of syntax and semantics. Section 2.1.6 describes ground promotion PVs in greater depth.

### 2.1.1 Resultative PVs (McIntyre, 2007)

There is a class of PVs whose particles express the result of the action expressed by their verbs. These PVs also tend to select internal arguments which are not selected by their simplex counterparts.

- (16) a. We voted the party out.  
b. \*We voted the party.
- (17) a. The button tore off.  
b. \*The button tore. (with the intended meaning)

In example (16a), there is a “voting” event, the result of which is that *the party* is *out* (of office). In its simplex form, however, *vote* is intransitive or takes a PP complement (e.g. *for the party*, *in favour of the motion*, etc.) Resultative particles can be said to transitivize simplex verbs.

### 2.1.2 Aspectual PVs (McIntyre, 2007)

Aspectual particles are a subclass of verbal particles which affect the *Aktion-sart* of the verbs with which they are associated. Consider the simplex/PV pairs in (18) and (19).

- (18) a. John fought the battle in an hour.  
b. \*John fought on in an hour.
- (19) a. \*Emily thought about the idea in an hour.  
b. Emily thought the idea over in an hour.

The pair in (18) shows a telic simplex verb with an atelic PV counterpart, while (19) shows the reverse alternation: an atelic simplex verb and a telic PV.

With respect to argument structure, these PVs form two classes: atransitive and non-atransitive. Atransitive PVs are transitive simplex verbs which become intransitive with the addition of particles. Non-atransitive PVs are those that do not become intransitive, meaning they are transitivized simplex verbs or transitive simplex verbs which remain transitive.

- (20) Atransitive PVs

- a. fight (\*the battle) on.
  - b. Sie hat (\*ein Lied) los-gesungen.  
     she AUX (a song)      away-sing.PTCPL  
     “She started to sing”
- (21) Non-atransitive PVs
- a. eat the chicken up
  - b. think the matter \*(over).
  - c. eine Theorie \*(aus)-arbeiten.  
     a    theory    out-work  
     “work out/write up a theory”

McIntyre argues that the atransitive and non-atransitive PVs have been wrongly grouped as a single class because they show different alternations with respect to argument structure.

### 2.1.3 Ground Promotion (McIntyre, 2007)

The term *ground* in ground promotion refers to one of the arguments of spatial prepositions, the other being figure. Spatial prepositions describe the spatial relation between a figure and a ground. For example, in the phrase, “the car near the building,” the figure (“the car”) is described as being in close proximity to (“near”) the ground (“the building”).

According to McIntyre, in ground promotion PV constructions the ground is expressed with the figure optionally expressed in an adjunct PP, while in their simplex verb counterparts, the obligatory argument of the verb is more likely to be the figure, with the ground in an optional PP.

- (22) **German** (McIntyre, 2007)

Er hat den Tee (mit heißem Wasser) **auf**-ge-gossen.  
 He AUX the.ACC tea (with hot water) auf-PTPL-pour

“He poured (hot water) on the tea.”

- (23) **Dutch** (Svenonius, 2003)

Ingrid smeert haar haar **in** (met henna).  
 Ingrid smears her hair in (with henna)

“Ingrid greases her hair (with henna).”

(24) I dumped the bucket out.

Ground promotion PVs differ from resultative and aspectual PVs, which seem only to affect the number of arguments a verb takes. Instead, ground promotion PVs select a different type of internal argument from their simplex counterparts.

#### 2.1.4 Objects of PVs: Arguments of the verbs or the particles?

McIntyre (2007) divides hypotheses about the argument structures of PVs into two classes. The first hypothesis, Verb-Dependency, says the non-agent argument of a PV is an argument of verbal component, while the second, Anti-Verb-Dependency, says that the internal argument of a PV is not an argument of the verb, and therefore must be an argument of the particle. He illustrates the distinction between the two hypotheses by looking at the examples below in (25)

- (25) a. I pushed the car in.  
       b. They voted the government \*(in).

Both hypotheses would argue that the direct objects in these examples are arguments of the resultative particle *in*. The Verb-Dependency hypothesis would say that the particles' arguments are also arguments of the verb, while the Anti-Verb-Dependency hypothesis would say that they are only arguments of the particles.

After framing the debate, McIntyre reviews some arguments in favour of either side. First, he discusses an argument based on the VP *push the car out*. The argument is that, because *push the car out* entails car-pushing, the object *the car* must be semantically an argument of the verb. He counters this argument, suggesting that car-pushing is not entailed but “an implicature based on direct causation” (McIntyre, 2007). He notes that the same intuition can be gotten with the VP *get the car out by pushing*. McIntyre concludes that since there is not necessarily any entailment, this is not an argument in favour of the Verb-Dependency hypothesis.

Next, he presents the argument that if the object of a PV is the argument of the particle, we should be able to derive a copula+particle construction from it. According to this argument we would expect the phrase

*bash me up* to entail the copular clause *\*I am up*, which it does not. McIntyre argues that this lack of entailment is actually due to the selectional requirements of the particle. The aspectual particle *up*, in *bash me up*, cannot productively be used with all verbs, and the copula is one of the verbs it can't be used in. McIntyre that there are some resultative particles that do allow a copula+particle construction, and that all of these seem to have idiosyncratic meanings. Consider the copular clause *He's down*. It can be used to describe the result of *drag him down* with an idiosyncratic meaning (i.e. “make him depressed”) but not a literal meaning (i.e. “drag him downstairs”). From this, McIntyre argues that, since the restriction on copula+particle constructions is unrelated to argument structure and the restriction does not apply to all PVs, it does not represent a convincing argument in favour of the Verb-Dependency hypothesis.

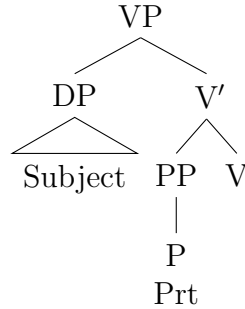
The final argument in favour of the Verb-Dependency compares *rip* with *rip up* and *rip out* (Carrier and Randall, 1992; Neeleman and Weerman, 1993). According to this argument, *rip* is subcategorized for a certain type of internal argument (e.g. *bag*) as are its PV forms.

- (26) a. I ripped *\*(the bag)*.
- b. *\*I* ripped the water.
- c. I ripped the bag up.
- d. *\*I* got the water bag and ripped the water out

McIntyre then shows clear counterexamples to this argument, where obligatorily intransitive verbs become transitive PVs (e.g. *think~think over* in (21b) or obligatorily transitive verbs become intransitive PVs (e.g. *singen~los-singen* in (20b) (?). Note that the PVs used to argue in favour of the Verb-Dependency side are resultatives, while those used to dispute the argument are aspectual particles.

After reviewing the arguments in favour of the Verb Dependency hypothesis and their counterarguments, he looks at the arguments in favour of the Anti-Verb-Dependency hypothesis. The first argument for the Anti-Verb-Dependency hypothesis he looks at is the assertion that it provides a natural explanation of atransitivity as in (20). For example, Zeller (2001) argues that particles merge in the argument position of verbs and thus block a direct object from being merged. The structure, Zeller assumes for the VP of an atransitive PV is below in (27).

(27)



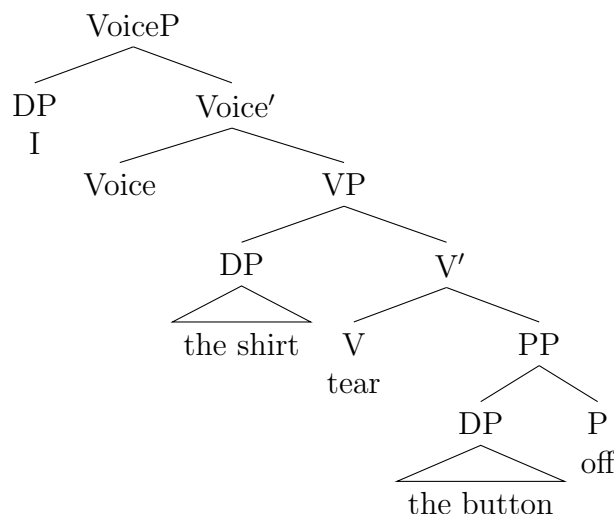
McIntyre (2007) argues that the fact that the Anti-Verb-Dependency hypothesis can provide a good analysis of atransitivity is only a good argument in its favour as long as the Verb Dependency hypothesis is unable to provide a similarly good analysis.

He then discusses arguments that are based on counterexamples to arguments in favour of the Verb Dependency hypothesis, but says that these have the same weakness as the arguments they are meant to counter: the presence of a counter example. For example, one could cite the non-atransitive PVs *think over* and *ausarbeiten* as evidence in favour of the Anti-Verb-Dependency hypothesis because they are transitive while their simplex forms are intransitive as shown in (21), above. But, one would then need to explain the pattern in (26), which is given as an example in favour of the Verb Dependency hypothesis.

The final concern McIntyre expresses regarding the Anti-Verb-Dependency hypothesis is the difficulty in theoretically enforcing it. If we assume, that transitive verbs on their own must take an internal argument, how can that requirement be satisfied by a particle? Consider the structure in (28), argued for by Zeller (2001), adapted to assume the split-vP hypothesis.



(28) \**I tore the shirt the button off.*



There is no structural reason that V cannot introduce its selected DP argument in its specifier, so Zeller's (2001) attempt to structurally enforce the Anti-Verb-Dependency hypothesis does not hold.

McIntyre points to a few attempts to enforce the Anti-Verb-Dependency hypothesis, including one of his own (McIntyre, 2004), but concedes that none approach the ease with which the Verb Dependency hypothesis is able to account for the various argument structure alternations and idiosyncrasies of PVs.

McIntyre (2007) is unable to make a clear claim in favour of either of the camps for two reasons. First, he attempts to apply both hypotheses to all PVs. Although PVs may form a single class with respect to purely morphosyntactic behaviour (i.e. English particle shift, German particle stranding, etc.), his discussion suggests that they cannot be analysed as a single class with respect to argument structure. Testing the hypotheses for a single class or sub-class of PVs, however, may be possible and, as such, this paper will focus on the ground promotion class of PVs.

The second flaw in McIntyre's (2007) discussion of the competing hypotheses, is that the question that the hypotheses are attempting to answer is deeper than the evidence which is brought to bear on it. McIntyre asks of PVs "Are direct arguments arguments of verbs or particles?" but never explains what it means to be an argument of one item and not the other.

In the next section, I will address the latter flaw, by providing criteria for

argumenthood. In the section after that, I will describe, in greater detail, the class of PVs that this paper will concern itself with: ground promotion

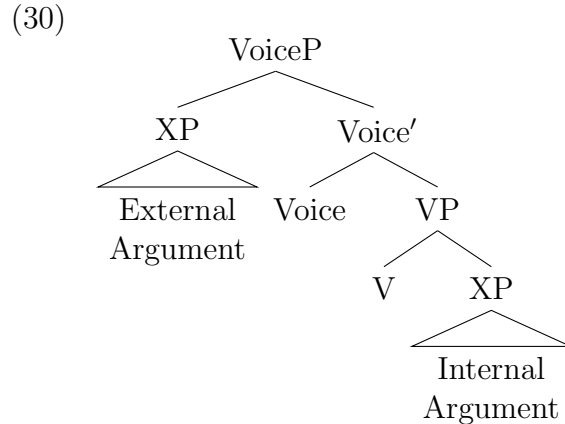
### 2.1.5 What does it mean to be an argument?

In this section, I will reframe the debate discussed in the previous section in structural terms so that I may more rigorously address the McIntyre’s (2007) question.

While studies of argument structure, like McIntyre’s, tend to focus on argument alternations between surface forms, there has been a significant body of research into the syntactic underpinnings of argument structure (Borer, 2005; Pylkkänen, 2008; Bruening, 2010; Kratzer, 1996, *inter alia*). All of this research assumes the Theta Role Assignment Principle (TRAP) as defined below in (29).

- (29) *Theta Role Assignment Principle (TRAP)* (Hornstein et al., 2005)  
 $\Theta$ -roles can only be assigned under a Merge operation.

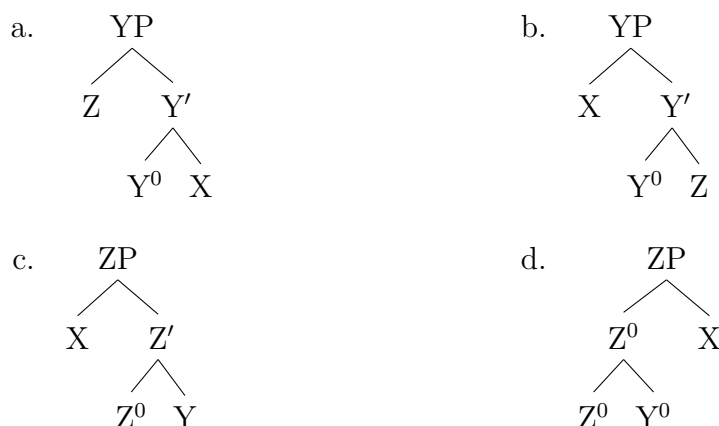
Syntactically, then, an argument of a given function-denoting item merges directly with a projection of that item. As schematized below in (30), the external argument of a verb is the XP that merges in Spec-Voice, while the internal argument of a verb is the (non-adjunct) XP that merges directly with the lexical Verb.



According to this structure, the internal argument of a verb is, in fact, the sole argument of the verb, while the external argument is the argument of Voice.

If arguments of a head must merge directly with a projection of that head, then they must be in the head's specifier or complement. Consider the relation between X and Y in the structures in (31), below.

(31)



In (31a) and (31b), X is an argument of Y because it merges with a projection of Y, while in (31c) and (31d), X does not merge with a projection of Y and therefore is not an argument of Y. In (31c), X and Y merge with projections of Z, and as such are arguments of Z. In (31d), Y forms a complex head with Z and does not project a phrase, which means X cannot merge with a projection of Y and cannot be an argument of Y.

We can then rephrase McIntyre's question as follows:

(32) *McIntyre's question - syntactic version*

Does the direct object of a particle verb merge with a projection of the verb or of the particle?

The verb-dependency hypothesis then, would state that the direct object merges with a projection of the verb, while the anti-verb-hypothesis would state that it merges with a projection of the particle.

This paper will address the question asked by McIntyre (2007) with a more constrained breadth and a greater depth. To that end, the discussion and analysis that follows will focus on the ground promotion class of PVs, and beyond the surface argument alternations, it will investigate the syntax and semantics of these PVs.

### 2.1.6 More on ground promotion PVs

This paper will focus on ground promotion PVs because of their relatively transparent semantics and comparability to V + PP constructions. PVs which allow ground promotion in English and German, also tend to allow the inverse situation, as shown below in (33) and (34a), where the figure is expressed and the ground is not. This inverse situation of ground promotion, which I will refer to as figure retention, shows the same surface properties as other PVs (Particle Shift in English, and Separability in German). Although ground promotion has been fairly well researched (McIntyre, 2007; Oya, 2009; Svenonius, 2003; Levin and Sells, 2007), figure retention has received little attention. Studies that do mention figure retention PVs, tend to classify them as resultatives (McIntyre, 2007; Levin and Sells, 2007).

(33) *rinse out*

a. **Full Expression**

I rinsed the coffee out of the urn.

b. **Ground Promotion**

I rinsed (out) the urn (out).

c. **Figure Retention**

I rinsed (out) the coffee (out).

(34) *eingießen* (“pour in”)<sup>1</sup>

a. **Full Expression**

i. Sie gieß-t      das      Bier in dein      Glas.

she pour-3SG the.ACC Beer in your.ACC glass.

“She is pouring the beer in your glass.”

ii. Sie hat      das      Bier in dein      Glas ge-goßen.

She AUX the.ACC Beer in your.ACC glass PTPL-pour

“She poured the beer in your glass.”

iii. Sie plan-t      das      Bier in dein      Glas zu gieß-en

she plan-3SG the.ACC Beer in your.ACC glass to pour-INF

“She is planning to pour the beer in your glass.”

---

<sup>1</sup>There is some variation between my consultants as to which PVs allow both ground promotion and figure retention. Where both are acceptable, however, the same syntactic and semantic patterns are found.

**b. Ground Promotion**

- i. Sie gieß-t      dein      Glas ein.  
she pour-3SG your.ACC glass in  
“She is filling your glass.”
- ii. Sie hat      dein      Glas ein-ge-goßen  
She AUX your.ACC glass in-PTPL-pour  
“She filled your glass.”
- iii. Sie plan-t      dein      Glas ein-zu-gieß-en.  
she plan-3SG your.ACC glass in-to-pour-INF  
“she is planning to fill your glass.”

**c. Figure Retention**

- i. Sie gieß-t      das      Bier ein.  
she pour-3SG the.ACC beer in.  
“She is pouring the beer.”
- ii. Sie hat      das      Bier ein-ge-goßen.  
She AUX the.ACC Beer in-PTPL-pour  
“She poured the beer.”
- iii. Sie plan-t      das      Bier ein-zu-gieß-en  
she plan-3SG the.ACC beer in-to-pour-INF  
“She plans to pour the beer.”

Although both English and German have ground promotion/Figure Retention PVs, the two languages differ with respect to which particles can combine with verbs to form them. In English, ground promotion/Figure Retention particles are restricted to *off* and *out*, while in German, particles meaning “into” and “onto” can also form ground promotion/Figure Retention PVs. In addition to explaining how ground promotion and figure retention occur, an analysis of these PVs should be able to explain why they are restricted to certain particles.

**2.1.7 Summary**

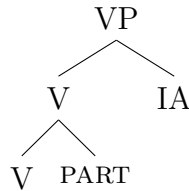
In this section I have given an overview of various argument structure alternations associated with PVs and introduced the Verb-Dependency/Anti-Verb-Dependency debate that this paper aims to contribute to. I argued that the debate as framed by McIntyre (2007) is inherently unresolvable,

because it lacks a precise theory of argument structure and attempts to address all PVs. I outlined a theory of argument structure which provides a definition of argument and restricted my domain of inquiry to a single class of PVs (i.e. ground promotion/Figure Retention PVs). Before providing an analysis, though, I will review another debate regarding the underlying syntactic structure of PVs.

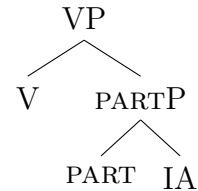
## 2.2 The Underlying Structure of PVs

There have been two general analyses of the structure of particle verbs, which can be called the Complex Head and Small Clause approaches. The Complex Head analysis states that the particle and verb enter the derivation as parts of a complex head, while in the Small Clause analysis, the two parts are independent projections.

(35) a. **Complex Head**



b. **Small Clause**



Another analysis, which, although it is not prominent, addresses an interesting theoretical issue, is the Late Adjunction hypothesis argued for by Newell (2005, 2008). According to this hypothesis, particles are adjoined late in the derivation, which means they are not subject to strict cyclicity (Lebeaux, 1988; Chomsky, 1993). In section 2.2.1 I will discuss some of the arguments for and against the complex head analysis. Section 2.2.2 looks at the strengths and weaknesses of a small clause analysis. Finally, in section 2.2.3, I will review the late adjunction analysis.

### 2.2.1 PVs as complex heads

Dehé (2002) discusses four arguments that PVs are introduced into the syntactic derivation as complex heads, a hypothesis argued for by Johnson (1991). One of these arguments is based on the argument structure facts

(as discussed above in section 2.1). In particular, Dehé cites examples from Johnson (1991) and Olsen (1997), reproduced below in (36) and (37)

- (36) a. We can't **make out** [<sub>CP</sub>whether he's lying or not].  
       b. **fill in** [<sub>CP</sub>whether you're married or not].
- (37) a. **let** someone **in** [<sub>PP</sub>on something].  
       b. **fix** someone **up** [<sub>PP</sub>with something].

(Dehé, 2002)

She argues that, in these cases, neither the particle nor the verb on its own would select a CP or PP object, and therefore the combination of the two must be responsible for the selection. These examples, however, represent a relatively small and idiosyncratic segment of English PVs, and an analysis of all PVs based on them would be problematic. The claim that the particle on its own would not select a PP or CP complement is, also, not entirely true. Consider the PV constructions in (38) below.

- (38) a. Andrew is **in** [<sub>PP</sub>on the plan].  
       b. The friends **went in** [<sub>PP</sub>on a gift].  
       c. **in** for a penny, **in** for a pound.

The *in*+PP construction is clearly licit with other verbs, or, in the case of (38c), without a verb at all. The examples in (38) suggest that the particle *in* is more important than the verb for introducing these PPs. To salvage this argument for the Complex Head analysis, one could argue that the particle *in* does select a PP complement, but only when it is part of a complex head with certain verbs. This suggests a generative lexicon, which forms complex heads pre-syntactically, a hypothesis which is controversial within generative syntax (Marantz, 1997; Harley and Noyer, 1999; Halle and Marantz, 1993).

Dehé also argues that the morphosyntactic behaviour of PVs suggests that they form a single constituent, which she assumes to be a complex head. First, she demonstrates that PVs can readily undergo the same morphological derivations that verbs do, such as nominalization, adjective formation, and middle constructions

- (39) a. Mikey's *looking up* of the reference.  
       b. Their *calling out* of the names.
- (40) a. John seemed *broken up* about the loss.

- b. the *dusted off* table
- (41) a. Bridges *blow up* easily.
- b. His car *breaks down* easily.

(Dehé, 2002)

Dehé argues that, since they are able to undergo these derivations, they must be complex heads.

Third, PVs behave like simplex verbs in gapping constructions, as in (42) Finally, PVs can be coordinated with simplex verbs as in (43)

- (42) a. Betsy looked up the address quickly and (\*up) the phone number slowly.
- b. Gary looked up Sam's number, and Mittie, (\*up) my number.
- (43) a. She *picked up* and *threw* the ball.
- b. He *put up* and *entertained* his friends.

(Dehé, 2002)

Since only verbal heads are elided in gapping constructions, and only like constituents can be coordinated, the fact that PVs are elided in gapping constructions and can be coordinated with simplex verbs suggests that they are complex heads.

The morphosyntactic arguments put forth by Déhé are far from conclusive. Most problematic about the arguments is that they only apply to PVs in the continuous order, which means that they only provide evidence that, when in the continuous order, PVs are complex heads. It does not necessarily follow from this that PVs enter the derivation as complex heads though. In fact, the gapping facts change when we look at the discontinuous order

- (44) a. Betsy looked up the address quickly and (\*up) the phone number slowly.
- b. Betsy looked the address up quickly and the phone number (?up) slowly.
- c. Betsy put the ball down and the dishes away.

Supposing, though, that we accept this data as evidence that the continuous order is the spellout of a PV as a complex head, we then have two possible analyses of the relationship between the continuous and discontinuous orders. If, as Déhé argues, the continuous order represents the lexical structure of a PV, then the discontinuous order must be derived by



excorporation of part of the PV. On the other hand, if PVs are completely separate heads, then the continuous order is derived by incorporation of the particle into the verb. Incorporation being a well known operation in the languages of the world, and excorporation being, at best, controversial, the complex head analysis of PVs has a significant burden to overcome.

### 2.2.2 Particles as small clause heads

One prominent hypothesis regarding the syntactic structure of PVs is that a particle and object combination forms a small clause (SC) (den Dikken, 1995; Kayne, 1985; Svenonius, 1996). Small clauses are constituents which have predication without inflection, like the bracketed parts of the sentences in (45), below.

- (45) a. Doug considered [<sub>SC</sub>Pete disruptive]  
       b. Charlotte judged [<sub>SC</sub>Marissa wise]

Early small clause type analyses of PVs argued that PVs are formally identical to Small clauses because they share a distribution. PVs, like small clauses, are resistant to nominalization, as shown in (46) and (47), below. Also, in both small clauses and PVs, post-verbal DPs cannot be wh-extracted from, as can be seen in (48) and (49), below.

- (46) Small clause - nominalization  
       a. Doug considered [<sub>SC</sub>Pete disruptive]  
       b. \*Doug's consideration of [<sub>SC</sub>Pete disruptive]
- (47) PV - nominalization  
       a. Kulap looked the information up.  
       b. \*?Kulap's looking of the information up
- (48) Small clause - wh-extraction  
       a. Scott considered [<sub>SC</sub>the step-father of Marissa strange].  
       b. \*Who<sub>i</sub> did Scott consider [<sub>SC</sub>the step-father of t<sub>i</sub> strange]?
- (49) PV - Wh-extraction  
       a. Graham tied the pet of Dave up.  
       b. \*Who<sub>i</sub> did Graham tie the pet of t<sub>i</sub> up?

Dehé (2002), however, notes that these parallels between PVs and small clauses only hold for PVs in the discontinuous order. When in the continuous order, PVs can readily be nominalized and Wh-extracted from.

- (50) PV - nominalization (cf. 39)
- a. Kulap looked up the information.
  - b. Kulap's looking up of the information
- (51) PV - Wh-extraction
- a. Graham tied up the pet of Dave.
  - b. Who did Graham tie up a pet of?

Dehé (2002) goes on to point out that, while small clauses can be rephrased as full clauses, as shown below in (52), the same is not true of PVs, as seen in (53).

- (52) Small clause - Paraphrasing (Dehé, 2002)
- a. I considered [<sub>SC</sub>John a fool].
  - b. I considered[John to be a fool].
- (53) a. I turned the radio down.
- b. \*I turned the radio to be down.

Perhaps the strongest evidence put forth by Dehé (2002) that PVs are not formally identical to small clauses is that the binding properties of the two constructions are different from each other. While preverbal DPs in small clause constructions do not bind postverbal anaphors, as seen in (54), subjects of PVs, like those in (55) can bind postverbal anaphors.

- (54) Small clauses - binding (Dehé, 2002)
- a. i. \*Mary<sub>i</sub> considered [<sub>SC</sub>the medicine good for herself<sub>i</sub>].
  - ii. Mary<sub>i</sub> considered [<sub>SC</sub>the medicine good for her<sub>i</sub>].
  - b. i. \*The boys<sub>i</sub> made [<sub>SC</sub>the towers taller than themselves<sub>i</sub>].
  - ii. The boys<sub>i</sub> made [<sub>SC</sub>the towers taller than them<sub>i</sub>].
- (55) PVs - binding
- a. i. The firemen<sub>i</sub> pulled [the equipment up to themselves<sub>i</sub>].
  - ii. ?The firemen<sub>i</sub> pulled [the equipment up to them<sub>i</sub>].
  - b. i. She<sub>i</sub> peeled [the sticker off herself<sub>i</sub>].
  - ii. ?She<sub>i</sub> peeled [the sticker off her<sub>i</sub>].

This distribution is strong evidence against the strict small clause analysis because, unlike much of the other evidence, it is independent of the word order of the PVs.

Small clauses, though, are a particular construction with a specific theoretical analysis. As such, if we accept Dehé’s (2002) argument that PVs and small clause constructions are not formally identical, we do not necessarily have to reject the notion that particles project phrases and take arguments. There are other possibilities, aside from small clauses, for secondary predication. In chapter 3 I will describe one such possibility.

### 2.2.3 Particles as late adjuncts

Newell (2005) investigates so-called “bracketing paradoxes,” which are cases where the morphological and semantic structures of words are misaligned. Specifically, Newell (2005) cites the nominalized German PV, *herumgerenne* (“act of aimless running”) as an example. Although the morphological structure of *herumgerenne* suggests that the participial and nominalizing morphemes (*ge-* and *-e*, respectively) are more local to the root than the particle is, as shown in (57a), Newell argues that *ge-* and *e* must semantically scope over the particle, as shown in (57b).

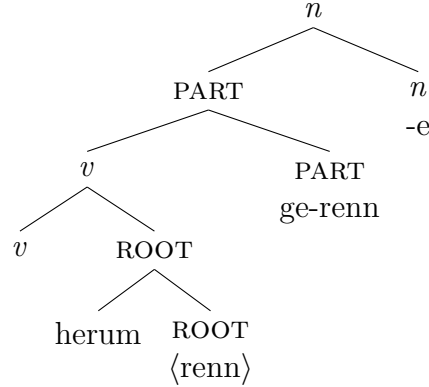
- (56) herum- ge-    renn -e  
       around PART run    N  
       “act of aimless running”

- (57) a. Morphological bracketing  
       [herum [ge [renn] e]]  
       b. Semantic bracketing  
       [ge [herum [renn]] e]

(Newell, 2005)

Newell’s (2005) analysis, like that of Dehé (2002), assumes that particles do not project a phrase, or at least do not take arguments. She argues that particles adjoin to traces of verbal roots post-syntactically.

(58)



Particles must adjoin to the verbal roots in order to be interpreted low, but must adjoin late in order to attach outside the participial morphology. While the general availability of late adjunction has been argued to exist (Lebeaux, 1988; Chomsky, 1993; Stepanov, 2001), the availability of such an approach relies on the proposal that particles are adjuncts and don't project a phrase. If particles are adjoined late in the derivation, we would not expect them to affect the argument structures of the verbs in the ways they have been shown to in section 2.1.

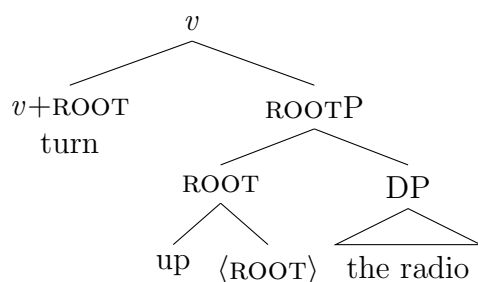
If Newell (2005) is correct, and particles are adjuncts which do not project a phrase, then they cannot take arguments. This implies that she tacitly assumes the Verb-Dependency hypothesis. But even if particles can be shown to take arguments, the late adjunction analysis could still, in principle, be salvageable, as PPs are often adjuncts. This move, however, raises further problems. If object-particle combinations represent PP adjuncts, then we would not expect an object to be able to be extracted out of it. Transitive PVs, however, can be passivized by raising objects raise to subject positions.

(59) [The radio]<sub>*i*</sub> was turned up *t<sub>i</sub>*.

So, if we accept that particles are adjuncts, then they cannot take arguments. The late adjunction analysis of PVs, then, must assume the Verb-Dependency hypothesis.

Although Newell (2005) shows that late adjunction can explain German PVs, it cannot be straightforwardly adapted to English. Suppose particles in English are adjuncts which attach to the roots of verbs, and that direct objects are the arguments of roots. As the structure in (60) demonstrates, we would only expect the continuous order to surface.

(60) “turn up the radio”



If we assumed instead that direct objects are the arguments of  $v$ , we would expect only the discontinuous order to surface.

Although the late adjunction hypothesis is problematic, the bracketing paradox that leads to it is not to be ignored in any analysis of PVs.

## 2.2.4 Summary

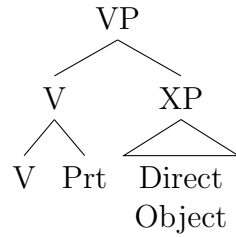
Each of the three types of analyses of the underlying structure of PVs has a set of facts that it can readily explain. Analyses which assume that PVs enter the derivation as complex heads predict that PVs in the continuous order undergo many of the morphological processes available to simplex verbs and behave identically to simplex verbs under coordination. While, strictly speaking, analysing PVs as involving small clauses is not a tenable position, analyses that take particles to be heads which project phrases can account for the fact that in the discontinuous order, PVs do not behave like simplex verbs. Finally, analysing particles as late adjuncts accounts for a bracketing paradox in German PVs where the surface order of the morphemes in PVs contradicts their interpretation, but makes incorrect predictions regarding word order in English PVs.

## 2.3 Connecting the two debates

In this chapter, I have discussed two debates about PVs. One debate, discussed in section 2.1, is about the source of argument structure alternations in PVs, while the other, discussed in section 2.2, concerns the underlying syntax of PVs. The two debates, as framed in this paper, are inherently connected. Take, for example, the connection between the Verb-Dependency

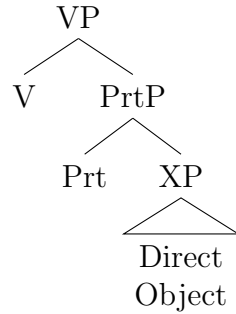
hypotheses and the Complex Head analysis. According to TRAP, defined in (29), an argument X of a head Y must merge with a projection of Y. If particles are part of a complex verb head, then they do not project a phrase and, therefore cannot take arguments, as shown below in (61).

(61) Complex Head analysis  $\rightarrow$  Verb-Dependency



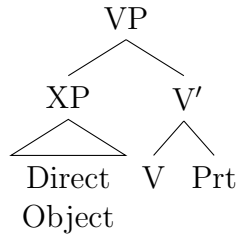
Hence, if PVs can be shown to be complex heads, then their direct objects must be arguments of the verb. It also follows from this that, if the Anti-Verb-Dependency hypothesis can be confirmed, then particles must project a phrase and, therefore cannot be part of a complex verb.

(62) Anti-Verb-Dependency  $\rightarrow$  Small clause analysis



Note that these implications are one-way, meaning that if it can be demonstrated that the small clause analysis is correct, then the Verb-Dependency hypothesis can still be true, and vice versa.

(63) Small clause analysis & Anti-Verb-Dependency



In the next chapter I will argue in favour of the Anti-Verb-Dependency hypothesis, and therefore a Small-Clause-like analysis of ground promotion PVs.





## Chapter 3

# The structure of PVs

In this chapter, I will argue in favour of an Anti-Verb-Dependency analysis for ground promotion PVs, and I will argue that the syntax and semantics of these PVs is closely related to those of spatial PPs. In section 3.1, I argue that grounds are semantically arguments of ground promotion particles, after which I provide a structural analysis of these PVs. I begin the structural analysis in section 3.2 by reviewing and adapting a syntactic theory of prepositional argument structure put forth by Svenonius (2003). Next, I will discuss the semantics of spatial prepositions in section 3.3 with the intention of discerning how spatial PPs might compose with verbs to form PVs. Finally, in section 3.4 I show how the syntactic phenomena of English and German PVs can be accounted for.

### 3.1 Ground Promotion objects as arguments of a spatial preposition

While the simplex forms of German and Dutch ground promotion PVs tend to take figure-type themes, the simplex forms of English ground promotion PVs tend to take ground-type themes. Consider the pairs of simplex and ground promotion PVs in (64) below.

- (64) a. i. rinse the pot  
      ii. rinse the pot out  
     b. i. wash the cloth  
      ii. wash the cloth out

- c. i. wipe the table
- ii. wipe the table off

Since there is no argument alternation, there is no obvious reason to argue that the objects are arguments of the particle. If we look at the interpretation of the object, we can see differences in its thematic properties depending on whether it is the object of a simplex verb or of a PV. The sentences below in (65) illustrate the difference of interpretation.

- (65) a. I rinsed the pot, but only the outside.  
 b. \*I rinsed the pot out, but only the outside.

The sentence in (65a) is acceptable because the object is interpreted as a theme or patient. The PV sentence in (65b) is contradictory, because the object is not being interpreted as a theme or patient, but as a ground. Both *rinse* and *rinse out* describe a “rinsing” event, but only *rinse out* describes the spatial configuration of that event. Specifically, part of the “rinsing” event must involve coming out of something, which cannot occur if the “rinsing” only applies to an exterior surface.

Furthermore, items which have no interior surface (i.e. are solid rather than hollow) cannot be interpreted as ground arguments of the V+*out* type PVs. Similarly, objects in sentences with the V+*off* PVs can only be interpreted as grounds if they have some sort of external surface. Consider the examples in (66), below.

- (66) a. rinse the marbles out  
**Interpretation:** \*rinse the internal surface of the marbles  
 b. wipe the fingerprints off  
**Interpretation:** \*wipe the external surface of the fingerprints

For example, the phrase *rinse the marbles out* can only be interpreted as *the marbles* leaving some ground due to a “rinsing” event.

Consider, also, the examples in (67), with *squeeze/squeeze out*.

- (67) a. i. squeeze the cloth  
 ii. squeeze the cloth out  
 b. i. squeeze the plastic sheet  
 ii. \*squeeze the plastic sheet out

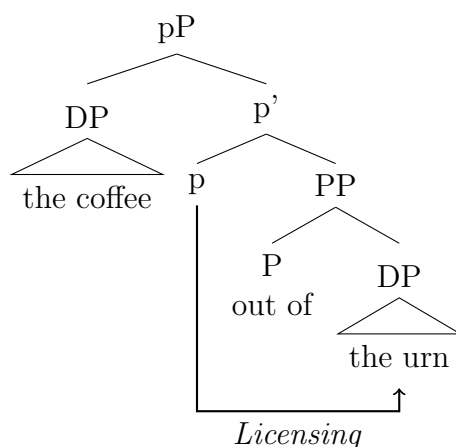
Both *the cloth* and *the plastic sheet* are acceptable themes for *squeeze*, but *the plastic sheet* not being absorbent has no interior and therefore is not an acceptable ground for *out*.

Because of the direct objects of simplex verbs and ground promotion PVs differ with respect to their thematic properties, I argue that direct objects of ground promotion PVs are ground arguments of the particles rather than themes of the verbs and that those particles define a spatial configuration. In the next sections I will argue that they are also syntactic arguments of the particle.

## 3.2 The pP

The syntactic theory of argument structure for spatial PPs assumed here is adapted from Svenonius (2003), who argues for an articulated PP roughly analogous to the articulated vP (Kratzer, 1996). In this version of the PP, the ground argument is introduced by P, which also contains the lexical (semantic and phonological) information of the preposition. The figure is introduced by a little-p head, which also assigns Case to the ground. In (68) below, we can see the structure of a full pP.

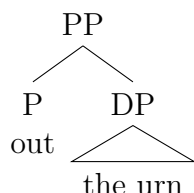
(68) (rinse) the coffee out of the urn.



Ground Promotion, then, occurs when the little-p head neither introduces a figure nor licenses the ground DP. According to Svenonius, little-p doesn't serve these functions in ground promotion because it is not in the deriva-

tion.<sup>1</sup> A ground promotion particle, then has the structure below in (69) *per* Svenonius (2003).

(69) (rinse) out the urn.



This is analogous to passives and unaccusatives, in which there is no external argument introduced, and the internal argument is not licensed *in situ*.

Svenonius (2003) does not, however, treat figure retention, which has no obvious treatment given the structure he proposes. Assuming figure retention occurs when the ground argument is not introduced into the derivation, in Svenonius' system, this would occur when the head which introduces the ground (P) is not part of the derivation. P, however, is also the locus of the particle's semantic and phonological content, and therefore must be in the derivation.

Figure Retention becomes explicable if, instead of assuming that it arises when the ground Argument is absent, we take the ground argument to be present but implicit. Figure Retention, then, would be nearly structurally equivalent to the full expression pP as shown above in (68).

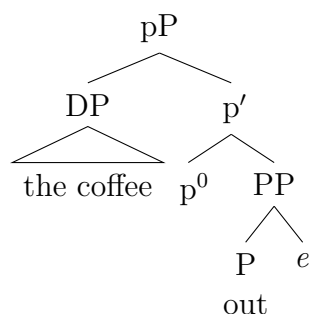
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<sup>1</sup> Svenonius argues that most West Germanic languages (e.g. German, Dutch, Afrikaans) have ground promotion PVs, while North Germanic languages (e.g. Swedish, Icelandic, Danish) and English are completely lacking in this class of PVs. He identifies the ability of West Germanic to not project little-p as the parameter responsible for this variation. While he acknowledges the English PVs that I have been discussing here, he says that they are only superficially ground promotion PVs. He argues that because the PVs that seem to allow ground promotion are cleaning verbs, their objects are "affected surfaces" and therefore represent figures. Consider the following two VPs.

- (1) brush the table off
- (2) brush the table off the ledge.

The DP *the table* is interpreted very differently between the two sentences above. In (1), *the table* remains stationary and something is moved off of it, while in (2), *the table* does move off of the ledge. In (2), *the table* is a figure, but in (1), *the table* is a ground.

(70) (rinse) the coffee out.



There is evidence in favour of the hypothesis that grounds in figure retention constructions are implicit rather than absent. As Levin and Sells (2007) note, while ground promotion requires no contextual support for interpretation, figure retention requires a contextually salient ground for proper interpretation. This can be seen in (71).

- (71) The maid said that whenever she goes in to clean a room, (Levin and Sells, 2007)
- a. #she has to wipe the fingerprints off.
  - b. she has to wipe the mirrors off.

This, however, does not completely describe the interaction of figure retention and context. If any possible ground is contextually available to a figure retention construction, it is interpreted as the ground of the PV. For example, consider the sentences in (72) and (73), which are examples of ground promotion and figure retention respectively in context. The contextual availability of a figure has no effect on the interpretation of ground promotion PVs,

- (72) ground promotion
- a. Whenever Sheila sees fingerprints, [she brushes her blazer off.]  
**Interpretation:** She brushes something off her blazer.  
**Not:** She brushes **fingerprints** off her blazer.
  - b. Whenever Tom finds oatmeal, [he rinses the coffee pot out]  
**Interpretation:** He rinses something out of the coffee pot.  
**Not:** He rinses **oatmeal** out of the coffee pot.
  - c. *German*

Sobald Sheila Fingerabdrücke sieht, bürstet sie  
 as.soon.as Sheila fingerprints sees brushes she  
 ihre Hose ab.  
 her.POSS.ACC trousers PRT

“Whenever Sheila sees fingerprints, she brushes her trousers off.”

**Interpretation:** She brushes something off her trousers.

**Not:** She brushes fingerprints off her trousers.

In the figure retention sentences, though, the salient objects (*the blazer* and *the coffee pot*) are interpreted as the ground arguments of the PVs.

(73) figure retention

- a. Whenever Jim wears his blazer, [he wipes the fingerprints off.]

**Interpretation:** He wipes the fingerprints off **his blazer**.

- b. Whenever Karen uses the coffee pot, [she rinses the oatmeal out.]

**Interpretation:** She rinses the oatmeal out of **the coffee pot**.

- c. *German*

Sobald Jakob seine Jacke trägt, bürstet er die  
 as.soon.as Jakob his.ACC jacket wears, brushes he the.PL.ACC  
 Schmutzflecken ab.  
 smudges PRT

“whenever Jakob wears his jacket, he brushes the smudges off.”

**Interpretation:** He brushes the smudges off his jacket.

Ground Promotion sentences, like those in (72), tend to give rise to an “OCD” reading, wherein the sight of a certain thing (e.g. fingerprints or oatmeal) triggers a compulsive response in the person (brushing off clothes or rinsing out a coffee pot).<sup>2</sup> This data makes the asymmetry noticed by Levin and Sells (2007) stronger. Not only do unexpressed grounds require

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<sup>2</sup> Six native English speakers were presented with figure retention and ground promotion sentences which included a “Whenever ...” context, and were asked a question about the unexpressed argument. For example, a participant who is presented with the sentence in (1a) would be asked the question in (1b)

- (1) a. Whenever Brigid opens the fridge, she clears the gadgets out.  
 b. Were the gadgets cleared out of something specific? If so, what?

contextual support for interpretation, but the contextually salient grounds are always interpreted as unexpressed grounds, while unexpressed figures reject contextual support. Compare the asymmetry between ground promotion and figure retention, as demonstrated in (72) and (73), with the interpretations of optionally transitive verbs below in (74) and (75), below.

(74) Intransitives

- a. Whenever Ellie sees a chair, she fights.

**Interpretation:** She fights

**Not:** She fights the chair.

- b. Whenever Oliver sees a plant, he eats.

**Interpretation:** He eats (something)

**Not:** He eats the plant.

(75) Transitives with pronouns

- a. Whenever Ellie sees a chair, she fights it.

**Interpretation:** She fights the chair.

- b. Whenever Oliver sees a plant, he eats it.

**Interpretation:** He eats the plant.

Just as the interpretation of pronouns is dependent on context, so is the interpretation of unexpressed grounds, even if that interpretation is strange or surreal. This similarity suggests that there is an empty category in the ground argument position.

The split-PP hypothesis provides an excellent analysis for the argument structure of ground promotion and figure retention particles. It makes these phenomena comparable to more thoroughly studied constructions such as passives and unergatives, which also bear on argument structure and implicit arguments, and it provides a natural explanation for the pragmatic effects of figure retention (Contextually determined grounds). The hypothesis does not, however, speak at all to the relationship between the particle and verb. The following section will approach this relationship from the perspective of their compositional semantics.

### 3.3 The Semantics of figure/Ground PVs

This section will focus on how the pP, described in the previous section, which encodes the figure-ground relation, composes with a verb in a PV

construction. Semantically composing the parts of a ground promotion PV is not straightforward, because the particle encodes a spatial relation, while verbs describe eventualities. Section 3.3.1 contains a non-formal discussion of the aspects of spatial meaning. In section 3.3.2, I discuss the formal predicates and their compositionality. Finally, in section 3.3.4, I show the implications of the semantics for the possible argument structures proposed above.

### 3.3.1 The basics

As mentioned above, in section 2.1.6, the prepositions with which this paper is concerned describe a relationship. More specifically they describe the spatial orientation of a figure with respect to a ground. As described by Jackendoff (1983) (also Zwarts and Winter, 2000; Svenonius, 2010, *inter alia*), there are two types of spatial prepositions: locative and directional. Locative prepositions describe static positions, or PLACES, which are relatively simple conceptually. Directional prepositions, on the other hand, describes trajectories, and are more complex than locatives.

Directional expressions come in three basic flavours: SOURCEPATHS, GOALPATHS, or ROUTEPATHS. A SOURCEPATH describes the start-point of a trajectory, a GOALPATH describes its end-point, and a ROUTEPATH describes an arbitrary portion of the the trajectory. For example, PPs with the prepositions *out of*, *into*, and *through* represent SOURCEPATHS, GOALPATHS, and ROUTEPATHS, respectively. The trajectories described by *out of* must originate inside the ground, those described by *into* must end inside the ground, and those described by *through* must have at least one portion inside the space occupied by the ground. Unlike PLACES, however, PATHS are not directly relative to grounds, but rather are relative to PLACES. The trajectories described by the prepositions above (*out of*, *into*, *through*), are relative to the PLACE, *inside*, which is relative to the ground.

With the basics of PATHS and PLACES in mind, I will describe a formal system for encoding them in the next section.

### 3.3.2 The semantic system

The formal semantic system I assume uses a limited class of atomic types, and principles of composition. As a starting point I will assume six atomic types: entities (*e*), truth-values (*t*), eventualities (*s*) (Heim and Kratzer,



1998; Kratzer, 1996), points ( $p$ ), vectors ( $v$ ), and indices ( $i$ ) (Zwarts and Winter, 2000). The system, then, can be described as follows

- (76) a.  $e, s, t, p, v$ , and  $i$  are all semantic types.  
 b. If  $\alpha$  is a semantic type and  $\beta$  is a semantic type, then  $\langle \alpha, \beta \rangle$  is a semantic type.  
 c. Nothing else is a semantic type.<sup>3</sup>

The relevant principles of composition for this analysis are Functional Application and Predicate Modification, which are defined in (77) and (78) respectively.

- (77) Functional Application (Heim and Kratzer, 1998)  
 If  $\alpha$  is a branching node,  $\{\beta, \gamma\}$  is the set of  $\alpha$ 's daughters, and  $\llbracket \beta \rrbracket$  is a function whose domain contains  $\llbracket \gamma \rrbracket$ , then  $\llbracket \alpha \rrbracket = \llbracket \beta \rrbracket(\llbracket \gamma \rrbracket)$ .  
 (78) Predicate Modification<sup>4</sup> (adapted from Heim and Kratzer, 1998).  
 If  $\alpha$  is a branching node,  $\{\beta, \gamma\}$  is the set of  $\alpha$ 's daughters, and  $\llbracket \beta \rrbracket$  and  $\llbracket \gamma \rrbracket$  are both in  $D_{\langle s, t \rangle}$ , then  $\llbracket \alpha \rrbracket = \lambda e_s [\llbracket \beta \rrbracket(e) \wedge \llbracket \gamma \rrbracket(e)]$

This system will provide the basis for the formal semantics of spatial expression as described in the following section. It will also be sufficient to show how the spatial semantics can compose with the events semantics of a verb in PV constructions.

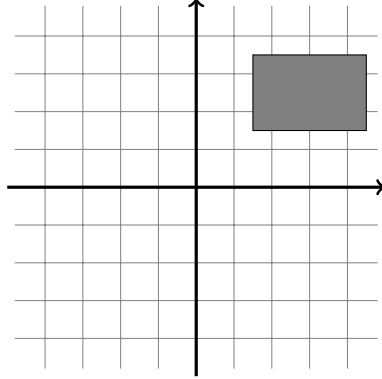
### 3.3.3 Formalizing Space: Points, Vectors, and Paths

Zwarts and Winter (2000) propose an analysis of prepositions which formalizes the spatial notions discussed by Jackendoff (1983). For Zwarts and Winter, the ground is represented as a set of points (i.e. a function of type  $\langle p, t \rangle$ ), or a region in three-dimensional space. (For ease of exposition, however, space will be represented as two-dimensional here) A prototypical ground is presented below, in (79), as a grey rectangle.

<sup>3</sup>I have excluded times and worlds from this set of types for reasons of relevance

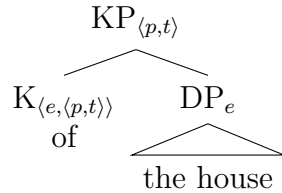
<sup>4</sup> The version of Predicate Modification that I assume in this paper is specific to event semantics. This differs from Predicate Modification as defined by Heim and Kratzer (1998), which only applied to properties of individuals (type  $\langle e, t \rangle$ ).

(79) The Eigenspace of a ground.



This set of points occupied by the individual referred to by the ground DP is called the *eigenspace* of that individual (Wunderlich 1991 cited by Zwarts and Winter 2000). The *eigenspace* of a DP, is defined by *loc*, which is a function from entities to sets of points ( $\langle e\langle p, t \rangle \rangle$ ). This *loc* function is part of the denotation of a head K which sometimes is pronounced as *of* and takes a DP as a complement (Svenonius, 2010), as shown below in (80).

(80) (*outside*) of the house

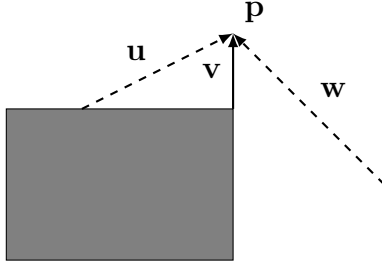


The points which define a ground are situated relative to some deictic origin (perhaps representing the speaker). The spatial configuration of figure, however, is not defined deictically, but rather relative to the ground.

Zwarts and Winter use the notion of *vectors* from linear algebra to formalize spatial semantics. Strictly speaking, a vector is an ordered pair of points (e.g. for three-dimensional space  $\langle \langle x_0, y_0, z_0 \rangle, \langle x_1, y_1, z_1 \rangle \rangle$ ), with the first point (e.g.  $\langle x_0, y_0, z_0 \rangle$ ) as the start-point of a vector, and the second (e.g.  $\langle x_1, y_1, z_1 \rangle$ ) as its end-point. For Zwarts and Winter, vectors in natural language semantics are limited to those whose start-points are on the boundary of the ground (called *boundary vectors*). Furthermore, there is a restriction to the *closest* boundary vectors, meaning each possible end-point has only one vector associated with it. The diagram below in (81)

shows a number of logically possible vectors ( $\mathbf{u}$ ,  $\mathbf{v}$  and  $\mathbf{w}$ ) given a single end-point ( $\mathbf{p}$ ). The vector  $\mathbf{w}$  is not a boundary vector, and therefore is not a valid vector in natural language. Both  $\mathbf{u}$  and  $\mathbf{v}$  are boundary vectors, but  $\mathbf{v}$ , having the smallest magnitude, is the *closest boundary vector*, making it the only valid vector with the end-point,  $\mathbf{p}$ .

(81) Valid and Invalid vectors.



In the rest of this discussion, I will use the term *vector* to refer to *closest boundary vectors*.

Vectors, in Zwarts and Winter's (2000) system, are used to describe PLACES, the simplest of which are **inside** and **outside**, which are defined by the predicates  $int(\mathbf{v}, A)$  and  $ext(\mathbf{v}, A)$  respectively.  $int(v, A)$  is true iff the end-point of the vector,  $\mathbf{v}$ , is contained by the *eigenspace* of the ground  $A$ , and  $ext(v, A)$  is true iff the end-point of  $\mathbf{v}$  is not contained by  $A$ .

$$(82) \quad \llbracket \text{outside} \rrbracket = \lambda A_{\langle pt \rangle} . \lambda \mathbf{v}_v . ext(\mathbf{v}, A) \quad (\text{Zwarts and Winter, 2000})$$

Zwarts and Winter, argue that all PLACES have either *ext*, or *int* in their definition. Take, for example, the preposition *on*, which describes a PLACE outside the ground, and therefore, uses the *ext* predicate in its denotation. The denotation must be more restrictive, though, because to say a figure is *on* a ground, it must be within a certain proximity to the ground (often in physical contact with it). To encode this proximity requirement, Zwarts and Winter propose the lengths, or magnitude, of the vectors defined by *on* must be smaller than some infinitesimally small positive number,  $r_0$ . The denotation of *on* is shown below in (83), where  $|\mathbf{v}|$  is the length of a vector.

$$(83) \quad \llbracket on \rrbracket = \lambda A_{\langle p, t \rangle} . \lambda \mathbf{v}_v . ext(\mathbf{v}, A) \wedge |\mathbf{v}| < r_0$$

So, the preposition *on* takes the eigenspace of the ground Argument ( $A$ ) and a vector ( $\mathbf{v}$ ), and evaluates to true iff the vector is external to the ground and has an infinitesimally small length.

Turning to directional prepositions, Zwarts and Winter argue against the natural assumption that their meaning can be represented by vectors, the start-points and end-points of which would represent the beginnings and endings, respectively, of the trajectories they describe. Since vectors are, essentially pairs of coordinates, representing start-points and end-points, they can be described by SOURCEPATHS and GOALPATHS, which describe start-points and end-points respectively. Vectors do not, however, define any points between their start- and end-points and as such cannot be described by ROUTEPATHS. Furthermore, allowing vectors with arbitrary start-points, undermines the restriction that vectors must be boundary vectors, which they argued for in their analysis of locatives. Instead, Zwarts and Winter argue that PATHS are represented by sets of *sequences* of vectors. A *sequence* is an ordered list, meaning each of its elements has a unique index. These indices are represented as objects of type  $i$ .

Formally, Zwarts and Winter represent trajectories as functions  $\Theta$  from indices to vectors ( $\langle i, v \rangle$ ). For Zwarts and Winter these indices are real numbers from 0 to 1, the index 0 marking the beginning of a trajectory, and the index 1 marking its end. So, for example, directional prepositions which describe SOURCEPATHS ( $\text{PATH}_0$ ) can be represented by sets of sequences of vectors, all of which have as their 0-element a vector which can represent a particular PLACE. The formal denotation (following Zwarts and Winter, 2000) is given below in (84).

$$(84) \quad \llbracket \text{PATH}_0 \rrbracket = \lambda P_{\langle \langle p, t \rangle, \langle v, t \rangle \rangle} \cdot \lambda A_{\langle p, t \rangle} \cdot \lambda \Theta_{\langle i, v \rangle} \cdot [P(A)(\Theta(0))]$$

So, a  $\text{PATH}_0$  function takes a locative preposition ( $P_{\langle \langle p, t \rangle, \langle v, t \rangle \rangle}$ ), a ground ( $A_{\langle p, t \rangle}$ ) and a  $\Theta$  function as arguments and evaluates to true iff the first vector of  $\Theta$  (i.e.  $\Theta(0)$ ) is a member of the set of vectors described by the locative preposition ( $P$ ) relative to the ground ( $A$ ). So, a  $\text{PATH}_0$  function adds a restriction to the vector argument of the PLACE function that it takes as an argument. The vectors evaluated by the PLACE function must be 0-elements of trajectories.

The meaning of the particle, *off*, is composed of  $\text{PATH}_0$  (see (84)) and  $\text{PLACE}_{\text{ON}}$  (see (83)) and has the denotation given in (85)

$$(85) \quad \begin{aligned} \llbracket \text{off} \rrbracket &= \llbracket \text{PATH}_0 \rrbracket (\llbracket \text{PLACE}_{\text{ON}} \rrbracket) \\ &= \llbracket \text{PATH}_0 \rrbracket (\lambda A_{\langle p, t \rangle} \cdot \lambda \mathbf{v}_v \cdot \text{ext}(\mathbf{v}, A) \wedge |\mathbf{v}| < r_0) \\ &= \lambda A_{\langle p, t \rangle} \cdot \lambda \Theta_{\langle i, v \rangle} \cdot [\text{ext}(\Theta(0))(A) \wedge |\Theta(0)| < r_0] \end{aligned}$$

The particle *off*, then, takes a ground argument ( $A_{\langle p, t \rangle}$ ) and a trajectory argument ( $\Theta_{\langle i, v \rangle}$ ) and is evaluated as true iff the 0-element of the trajectory is *on* the ground. That is, a trajectory can be described as *off* iff its 0-element is a vector external to the ground and has an infinitesimally small length. The denotation is arrived at by replacing  $\text{PATH}_0$  with its denotation (given in (84)) which takes, as its first argument,  $\text{PLACE}_{\text{ON}}$  which has been replaced with its denotation (given in (83)). This gives us the final denotation of *off*, with the denotation of *on* replacing  $P$  and  $\Theta(0)$  replacing the vector argument of  $P$ . Given the predicates discussed so far, we can give a denotation to the PP “off the table” in (86), below.

$$(86) \quad \llbracket \text{off the table} \rrbracket = \lambda \Theta_{\langle i, v \rangle}. [\text{ext}(\Theta(0))(\text{loc}(\mathbf{the\ table})) \wedge |\Theta(0)| < r_0]$$

The *eigenspace* of *the table* ( $\text{loc}(\mathbf{the\ table})$ ) has now saturated the ground argument ( $A$ ) of *off*. According to this denotation, a trajectory can be described as *off the table* iff the 0-element of that trajectory is a vector outside the *eigenspace* of the table and the length of that vector is infinitesimally small. The type of the PP is, then,  $\langle \langle i, v \rangle, t \rangle$ , or a property of trajectories. Syntactically, the PP combines with little-p, which introduces the figure

The predicate Zwarts and Winter propose as responsible for introducing the figure argument ( $\text{loc}^-$  defined below in (87)), however, is of type  $\langle \langle v, t \rangle, \langle e, t \rangle \rangle$ , and as such applies only to locative PPs.

$$(87) \quad \text{loc}^- \stackrel{\text{def}}{=} \lambda W_{\langle v, t \rangle}. \lambda x_e. \forall \mathbf{p} \in \text{loc}(x) \exists \mathbf{v} \in W [e\text{-point}(\mathbf{v}) = \mathbf{p}]$$

The function *e-point* is a predicate from vectors to points, which defines the end-point of a vector.

Adapting  $\text{loc}^-$  would not be as simple as changing the type of its first argument from  $\langle v, t \rangle$  to  $\langle \langle i, v \rangle, t \rangle$ , as in (88), below.

$$(88) \quad \text{loc}_{\text{dir}}^- \stackrel{\text{def}}{=} \lambda W_{\langle \langle i, v \rangle, t \rangle}. \lambda x_e. \forall \mathbf{p} \in \text{loc}(x) \exists \mathbf{v} \in W [e\text{-point}(\mathbf{v}) = \mathbf{p}]$$

While this would be able to compose with the directional PP, the denotation would be contradictory. The argument representing the directional expression ( $W$ ) is of type  $\langle \langle i, v \rangle, t \rangle$ , meaning it denotes a set of trajectories (type  $\langle i, v \rangle$ ). If  $\mathbf{v}$  is a member of the set  $W$ , it must be of type  $\langle i, v \rangle$ , and is therefore not an appropriate argument for the function *e-point*, which takes a vector (type  $v$ ) and returns its end-point (type  $p$ ). The expression  $e\text{-point}(\mathbf{v})$  will therefore be undefined, rendering the expression  $[e\text{-point}(\mathbf{v}) = \mathbf{p}]$  false in all cases and therefore contradictory.

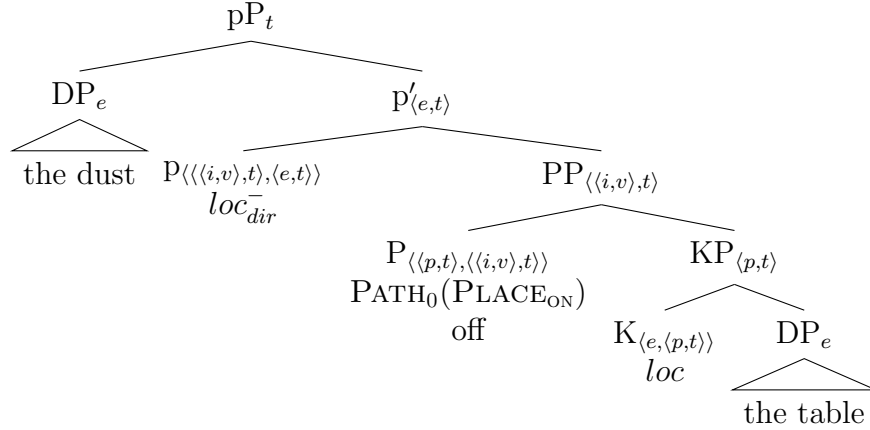
A proper  $loc_{dir}^-$  predicate would take as arguments the set of trajectories described by a PATH and an entity (the figure). The figure would have to follow a trajectory described by the PATH, meaning for any given index, the end-point of the vector described by the trajectory at that index coincides with a point in the *eigenspace* of the figure. As I have described it, the denotation of the figure introducing predicate is given below in (89)

$$(89) \quad loc_{dir}^- \stackrel{def}{=} \lambda W_{\langle\langle i,v \rangle, t \rangle}. \lambda x_e. \exists \Theta \in W. \forall i \in [0, 1]. \exists \mathbf{p} \in loc(x). [e-point(\Theta(i)) = \mathbf{p}]$$

The directional PPs in PVs describe trajectories that extend over time<sup>5</sup>. The denotation I have given does not include any temporal information. Perhaps the temporal aspect of these directional expressions requires additional specification in the denotation, or perhaps some of the types or predicates used can be rethought to include notions of time. I will set aside the full definition of the figure introducing predicate for directional pPs for the purposes of this paper and assume a black box predicate  $loc_{dir}^-$  of type  $\langle\langle\langle i, v \rangle, t \rangle, \langle e, t \rangle\rangle$  is responsible for figure introduction.

Putting these denotations together, we get the pP structure decussed in section 3.2, as shown below in (90).

$$(90) \quad \llbracket \text{the dust off the table} \rrbracket$$



As the above structure demonstrates, the denotation of a full pP, as I have described it in this section, is a proposition. Since the verbs of ground

<sup>5</sup> As Jackendoff (1983) notes, not all directional expressions describe trajectories that extend over time. For example, in the sentence *The road runs along the riverbank*, does not describe a road moving over time, but rather, only through space.

promotion and figure retention do not take propositions as arguments, we must alter the structure to allow it to compose with the verb. The following section will provide those alterations.

### 3.3.4 Composing the pP and Verb

With a firm grasp on the semantics of spatial prepositions, I will now turn to the combination of V and PP, as in *wipe the dust off the table*. First, though I will show how a verb might combine with a PP that does not introduce a figure (e.g. *wipe off the table*) I will then show that the function allowing for the composition of a verb with a PP must be part of the denotation of the figure-introducing head.

From the discussion above, it can be said that the denotation of *off the table* (before the introduction of the figure), is a property of paths (type  $\langle\langle i, v \rangle, t \rangle$ ). Following Ramchand (2013) and Zwarts (2006), I will use a predicate which defines the spatial manifestation of an eventuality, so that a relation between it and the spatial configuration denoted by the PP can be expressed. I will use the function *SHAPE*, which takes an eventuality and returns a set of *PATHS* (type  $\langle s, \langle\langle i, v \rangle, t \rangle \rangle$ ). The set of *PATHS* denoted by the *SHAPE* of a given eventuality, must be a subset of that denoted by the PP<sup>6</sup>.

$$(91) \quad \left[ \begin{array}{c} \text{VP} \\ \swarrow \quad \searrow \\ \text{V} \quad \text{PP} \end{array} \right] = [\![V]\!] \wedge \text{SHAPE}(e) \subseteq [\![PP]\!] \quad (\text{Ramchand, 2013})$$

Incorporating this *SHAPE* into our semantic derivation requires that it be part of the denotation of a syntactic head. In order not to prejudge the syntactic structure of this putative head, I will refer to it as  $\Omega$ . Since  $\Omega$  describes a relation between *SHAPE* and the denotation of the PP, it must take an event argument and function of type  $\langle\langle i, v \rangle, t \rangle$ .

Supposing, for now that there is some syntactic head,  $\Omega$ , which bears the semantics described thus far, there are two possible syntactic relationships

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<sup>6</sup> Sentences with sequential directional PPs, like those in (1) suggest the relation between the *SHAPE* of an event and the directional expression is more complicated than a simple subset.

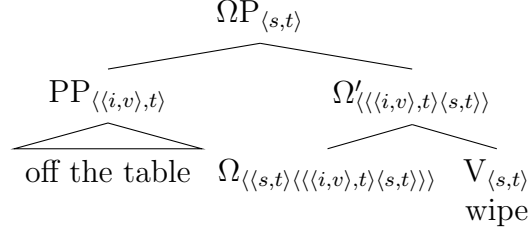
(1) Declan his the ball over the fence, across the street, and into the window.

Since only compositionality is crucial to this paper, I will use the simpler relation

that it could have with the PP: either a SPEC-HEAD relation, or a HEAD-COMP relation. The structures for these relations along with the denotation of  $\Omega$  that follows from each structure are shown below in (92) and (93).

(92) SPEC-HEAD

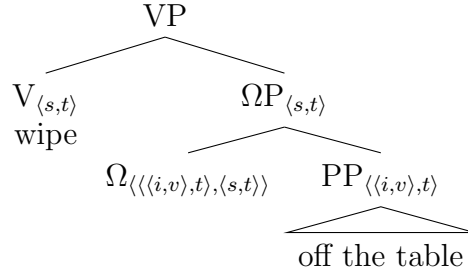
a.



b.  $\llbracket \Omega \rrbracket = \lambda F_{\langle s, t \rangle}. \lambda P_{\langle \langle i, v \rangle, t \rangle}. \lambda e_s. [F(e) \wedge \text{SHAPE}(e) \subseteq P]$

(93) HEAD-COMP

a.



b.  $\llbracket \Omega \rrbracket = \lambda P_{\langle \langle i, v \rangle, t \rangle}. \lambda e_s. [\text{SHAPE}(e) \subseteq P]$

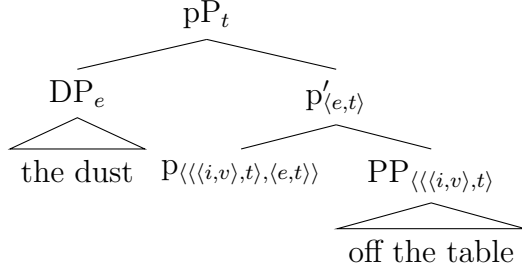
In order for  $\Omega$  to combine with a PP ( $P_{\langle \langle i, v \rangle, t \rangle}$ ) in its specifier, as in (92), it must take the verb ( $F_{\langle s, t \rangle}$ ) in its complement as an argument. If  $\Omega$  combines with the PP in its complement, as in (93), the resulting item is of type  $\langle s, t \rangle$  and can combine with a verb under Predicate Modification. Although each structure requires a different denotation for  $\Omega$ , both are semantically tenable if all that is needed is the composition of the PP with the Verb. The structure in (92) requires that  $\Omega$  take the verb as an argument, a stipulation that the structure in (93) does not make. If we add the requirement that a figure be introduced, the two structures can be further distinguished.

In the previous section, I looked at semantic approach to figure introduction which links the figure directly to the spatial semantics. Regardless of how the function required is structured, it must take at least two arguments: the figure (type  $e$ ), and the function denoted by the PP



(type  $\langle\langle i, v \rangle, t\rangle$ ). The semantic type of little-p, as discussed in section 3.3.3 above, is  $\langle\langle\langle i, v \rangle, t\rangle, \langle e, t \rangle\rangle$ , which means that, in the pP shown in (94), it will combine with a PP, returning an object of type  $\langle e, t \rangle$ , which will then combine with the entity-denoting figure argument, to return a proposition.

(94)

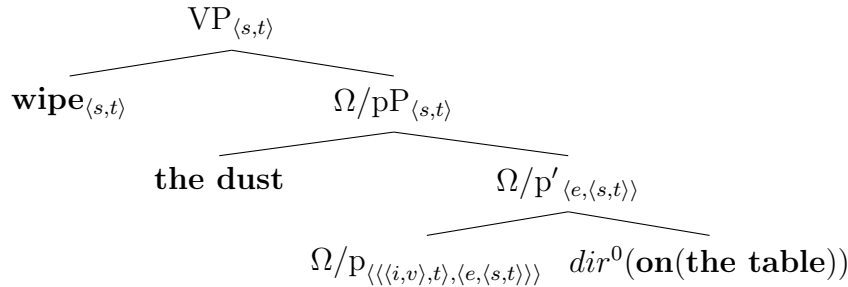


This leaves no possibility for the pP to combine with any verbal structure in the ways shown in (92) and (93). Similarly, given that  $\Omega P$  is of type  $\langle s, t \rangle$ , neither little-p nor a figure argument is able to combine semantically with it.

If the  $loc_{dir}^-$  predicate and the denotation of  $\Omega$  were to be combined into a single semantic object, as defined below in (95), that object could both introduce the figure argument and allow the phrase it heads to combine with the verbal structure.

$$(95) \quad \llbracket \Omega + p \rrbracket = \lambda W_{\langle\langle i, v \rangle, t \rangle} . \lambda x_e . \lambda e_s . \text{FIGURE}(x)(W) \wedge \text{SHAPE}(e) \subseteq W$$

This new semantic object, of type  $\langle\langle\langle i, v \rangle, t\rangle, \langle e, \langle s, t \rangle \rangle\rangle$ , would take the place of little-p in (94). the  $\Omega + p$  function first takes a function (W) denoting a set of  $\Theta$ s, followed by an entity (x) which it interprets as the figure, and finally an eventuality, making the denotation of a pP an object of type  $\langle s, t \rangle$ , which could combine with verbal structure by Predicate Modification. So, the Logical Form of a full expression PV is shown below in (96)

(96)  $\llbracket \text{wipe the dust off the table} \rrbracket$ 

The  $\Omega/p$  head combines with the directional expression (type  $\langle\langle i, v \rangle, t\rangle$ ) by Functional Application. The resulting function combines with the figure (type  $e$ ) by Functional Application and returns a function of type  $\langle s, t \rangle$  which combines with the verb by Predicate Modification.

Recall that Svenonius (2003) argued that ground promotion occurred when little- $p$  was not projected. Since his version of little- $p$  was only responsible for introducing the figure, he was able to argue this. As I have argued above the figure-introducing head must also encode the semantic information which allows the spatial expression to combine with the event semantics. As such, a ground promotion PP must have some head intervening between it and the Verb. I take this head to be another flavour of little- $p$ .

### 3.3.5 Summary

In this section I have discussed the semantics of the spatial V+PP constructions that I argue are the basis of figure/ground PVs. After describing the key notions of spatial semantics, I presented a formal semantics of space adapted from Zwarts and Winter (2000), which is based on a vector space. I have shown how the vector semantics introduces figures and grounds, how it combines with the event semantics of verbs. In this discussion I argued that the little- $p$  introduced in section 3.2, is responsible both for introducing the figure and allowing the spatial expression combine with the verb. I further argued that Svenonius (contra 2003) ground promotion particles must project a little- $p$ . In the next section I will discuss the syntax of PVs further.

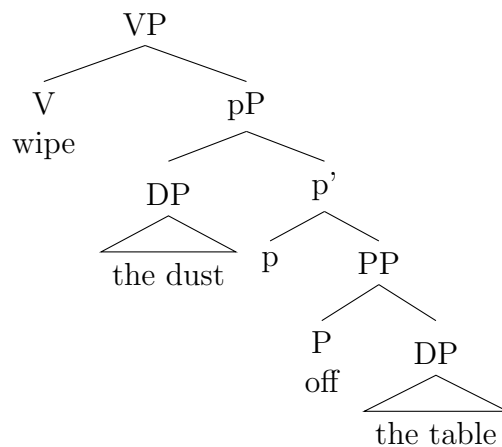
## 3.4 The Syntax of PVs

As discussed above, there are four possible configurations for full expression pPs which give the correct semantic interpretation. In this section, I will evaluate these putative structures from a syntactic standpoint. The correct structure must be able to derive the surface forms described in Section 1.1: specifically, English particle shift and German separable prefixes.

### 3.4.1 English Particle Shift

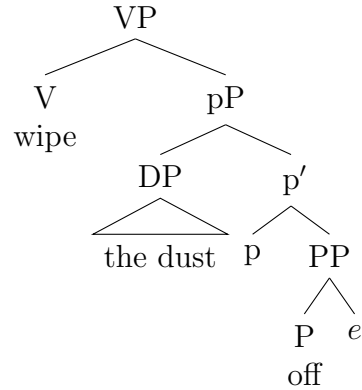
Based on the semantic discussion above, it is clear that in their base generated positions figures c-command prepositions/particles, which, in turn, c-command grounds as shown in (97) below.

(97) Full expression pP (*wipe the dust off the table*)

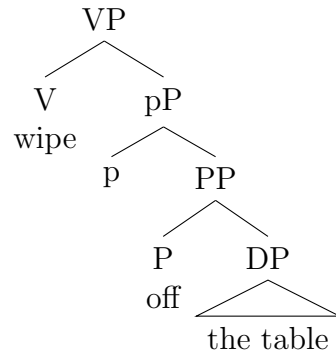


If we assume that in English heads precede their complements, this base generated structure surfaces in the correct order. As described in section 1.1.1, though, the internal argument of a PV in English can just as readily surface to the left of a particle as it can to its right, regardless of whether it represents a figure or a ground. The base-generated structures that I have argued for so far, however, predict that figure retention constructions will surface in discontinuous order, while ground promotion constructions will surface in continuous order. This can be seen in the structures in (98) and (99).

(98) figure retention (Wipe the dust off)



(99) ground promotion (Wipe off the table)



The specific structure of PVs must allow for a derivation which results in an instance of the ground argument dominating the particle and one which results in the particle c-commanding the figure.

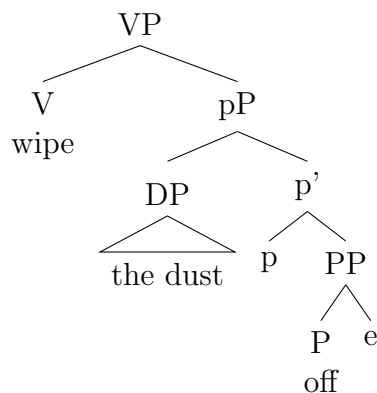
(100)

		ground promotion	figure retention
V	PRT OBJ	Base generated	????
V	OBJ PRT	????	Base generated

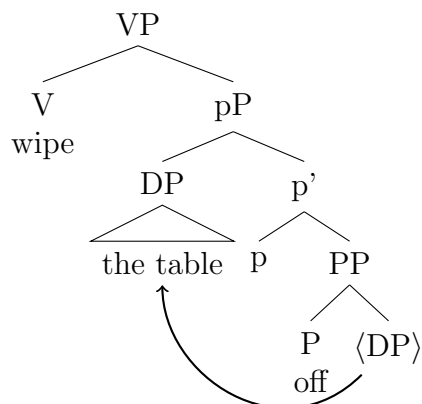
To begin, I will show how both figure retention and ground promotion PVs can surface in the discontinuous order. As noted above, and shown below in (98), figure retention PVs will surface in the discontinuous order in their base-generated structures, so no additional movement is required. In a ground promotion PV, however, the ground Argument must raise to the specifier of p, the base generated position of figures. The ground raises

because, just as passive *v*/Voice does not license Case on the theme argument (Chomsky, 1995; Kratzer, 1996), the non-figure-introducing little-*p* does not license Case on the ground argument.

(101) figure retention PV (*wipe the dust off*)



(102) ground promotion (*wipe the table off*)



The base generated position of the figure, and the movement of the ground to spec-*p* in ground promotion gives us the discontinuous order.

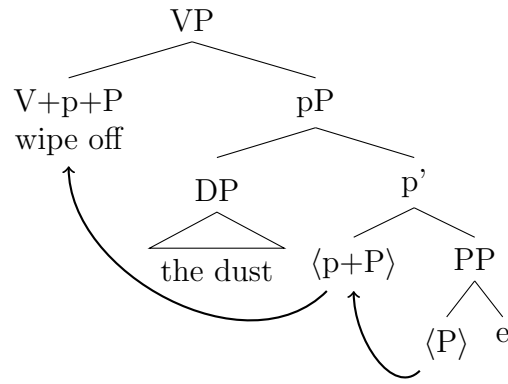
While movement for Case gives us the discontinuous order for ground promotion, movement of this type (i.e. to satisfy formal features) is generally assumed to be obligatory, so we now must explain the apparent optionality of particle shift for ground promotion. Also, if ground raising is obligatory for ground promotion PVs, we can no longer get the continuous order from the base generated structure (shown above in 99)), as that

structure will never surface.

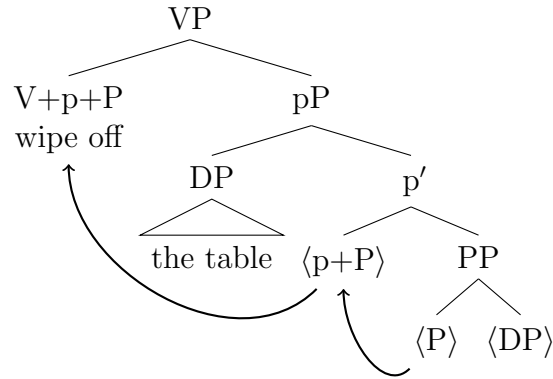
(103)	ground promotion				figure retention
	V	PRT	OBJ	????	????
	V	OBJ	PRT	Raise DP to Spec-p	Base generated

In order to get the continuous order in figure retention, and now also for ground promotion, P must head-move to V.

(104) figure retention PV (*wipe off the dust*)



(105) ground promotion (*wipe off the table*)



As further evidence of the syntax of PVs, it can be shown that the particle does head-adjoin to the verb. As demonstrated in (106-108), an adverbial adjunct may appear immediately preceding the preposition in a full expression pP, but not in either ground promotion or figure retention with the continuous order (Elizabeth Cowper, p.c.)

(106) full expression

- a. I wiped the dust quickly off the table.

(107) Discontinuous Order

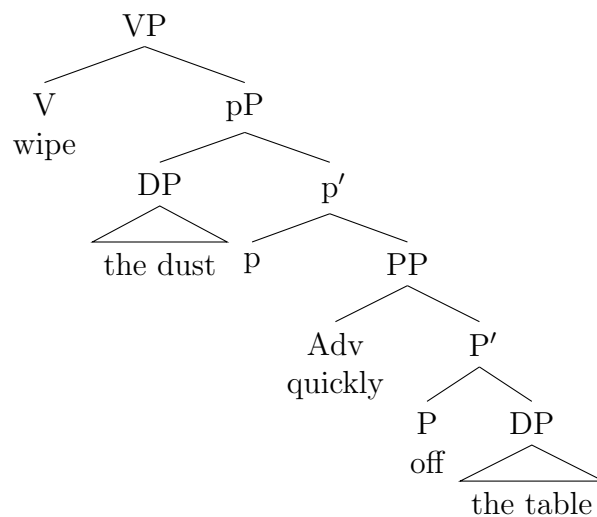
- a. I wiped the dust quickly off.  
b. ?I wiped the table quickly off.

(108) Continuous Order

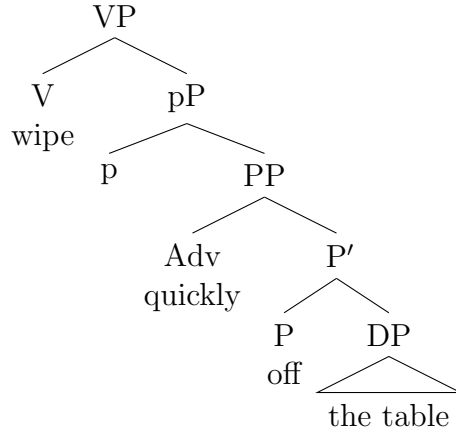
- a. \*I wiped quickly off the dust.  
b. \*I wiped quickly off the table.

If the continuous order in ground promotion arose from its base-generated structure, as shown below in (110), we would expect adjunction to be as acceptable as in the full expression construction, as shown below in (109). As demonstrated in (108b), though, such adjunction is not allowed in the continuous order of the ground promotion PV.

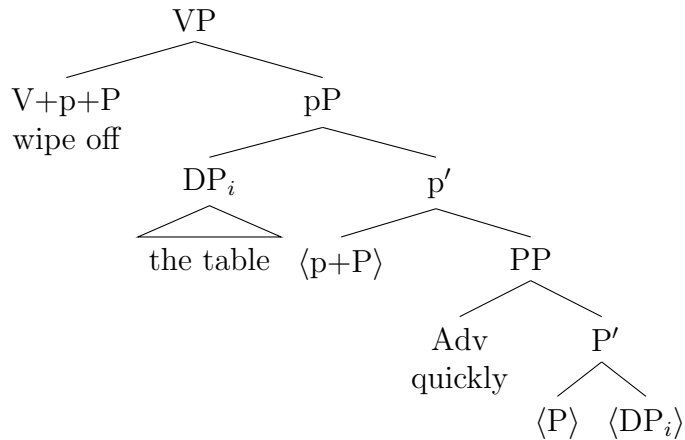
(109) Full Expression with adjunction



(110) \*Ground Promotion in situ



(111) Ground Promotion with head movement



To sum up, two syntactic operations are needed to explain the facts of English PVs. One operation, ground raising, is required for ground promotion PVs, while the other, p-to-V movement, applies to figure retention and ground promotion PVs alike.

(112) A summary of the operations in PVS

			ground promotion	figure retention
V	OBJ	PRT	Raise DP to Spec-p	Base Generated
V	PRT	OBJ	Raise DP to Spec-p	p-to-V movement
			p-to-V movement	

This ability to head-adjoin to verbs seems to be the main syntactic hallmark of particles in English. As such, we would expect the optionality



of particle shift to arise from optionality in p-to-V movement. That p-to-V movement may or may not occur suggests that, unlike ground raising, it does not occur to check formal features.<sup>7</sup>

### 3.4.2 German PVs

In section 3.4.2.1, I will show how particle stranding can be accounted for syntactically. Section 3.4.2.2 presents a syntactic account of the intervening morphemes *zu* and *ge-*.

#### 3.4.2.1 Particle Stranding

As shown in section 1.1.2.1, German has V2 word order, which means that, in a matrix clause, the finite verb is the second constituent and all other verbs are clause final. Standard syntactic representations of German V2 word order derive it by assuming that the German IP is head-final, and the finite verb undergoes both V-to-I movement and, when not blocked by an overt complementizer, I-to-C movement.

(113) Finite lexical verb ( $\approx$ 10a-i)

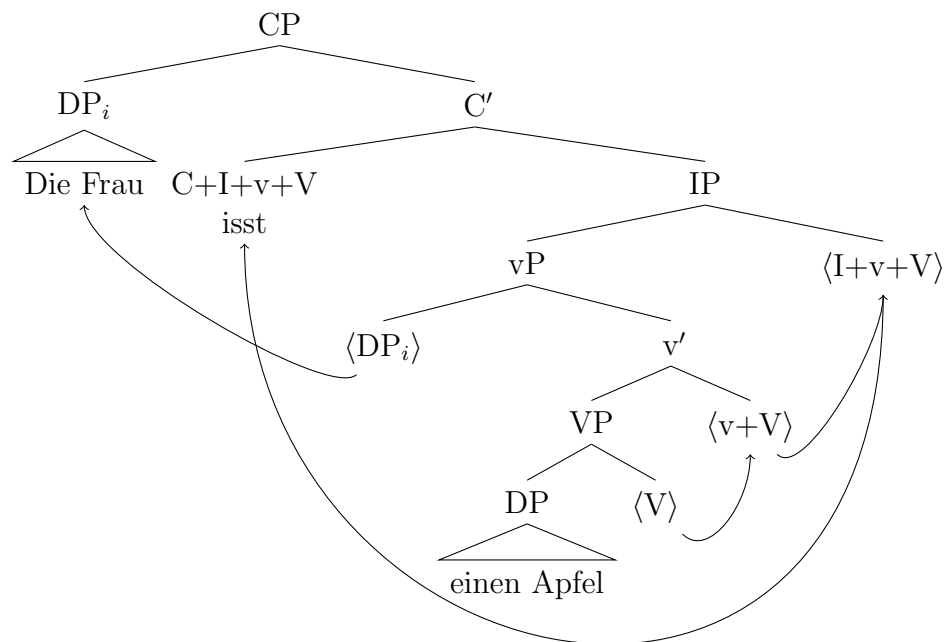
- a. Die Frau isst einen Apfel.  
the.NOM woman eats an.ACC apple.

“The woman is eating an apple.”

---

<sup>7</sup> The motivation of p-to-V movement is unclear, but this is the case of head movement in general within minimalist syntax.

b.



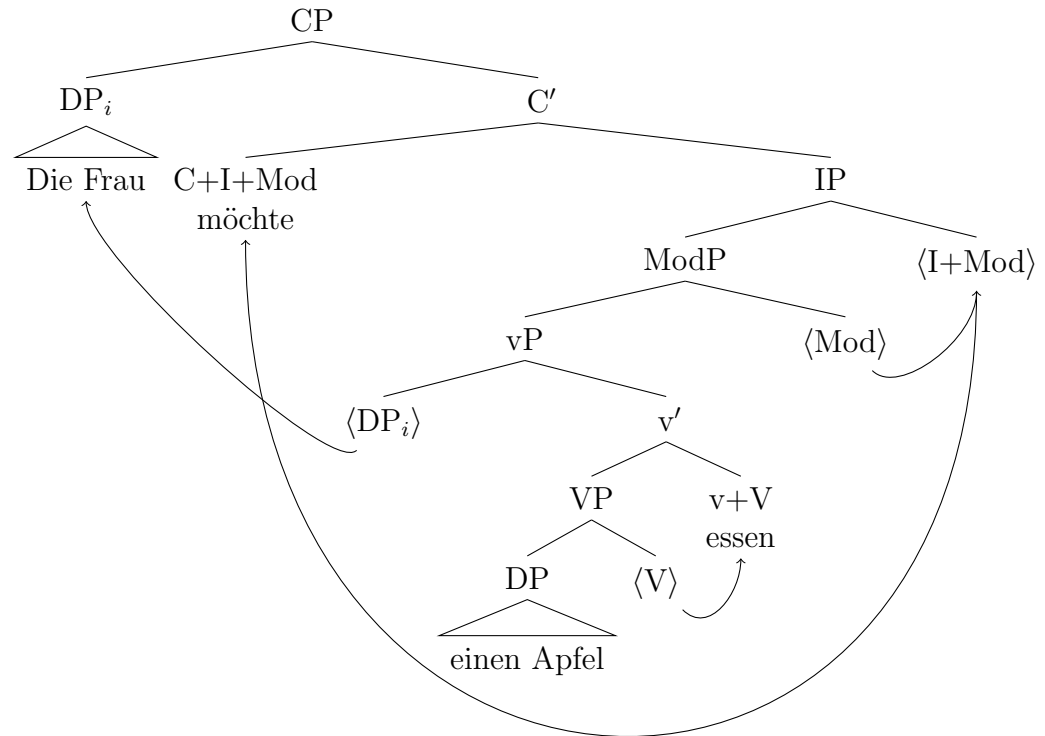
Verbs surface clause-finally when another verb (e.g. a modal) occupies I and blocks V-to-I movement. The modal, merged above v, moves to I and then moves to C and appears in second position.

(114) Finite modal (≈10b-i)

- a. Die Frau möchte einen Apfel essen.  
the.NOM woman would.like an.ACC apple eat.

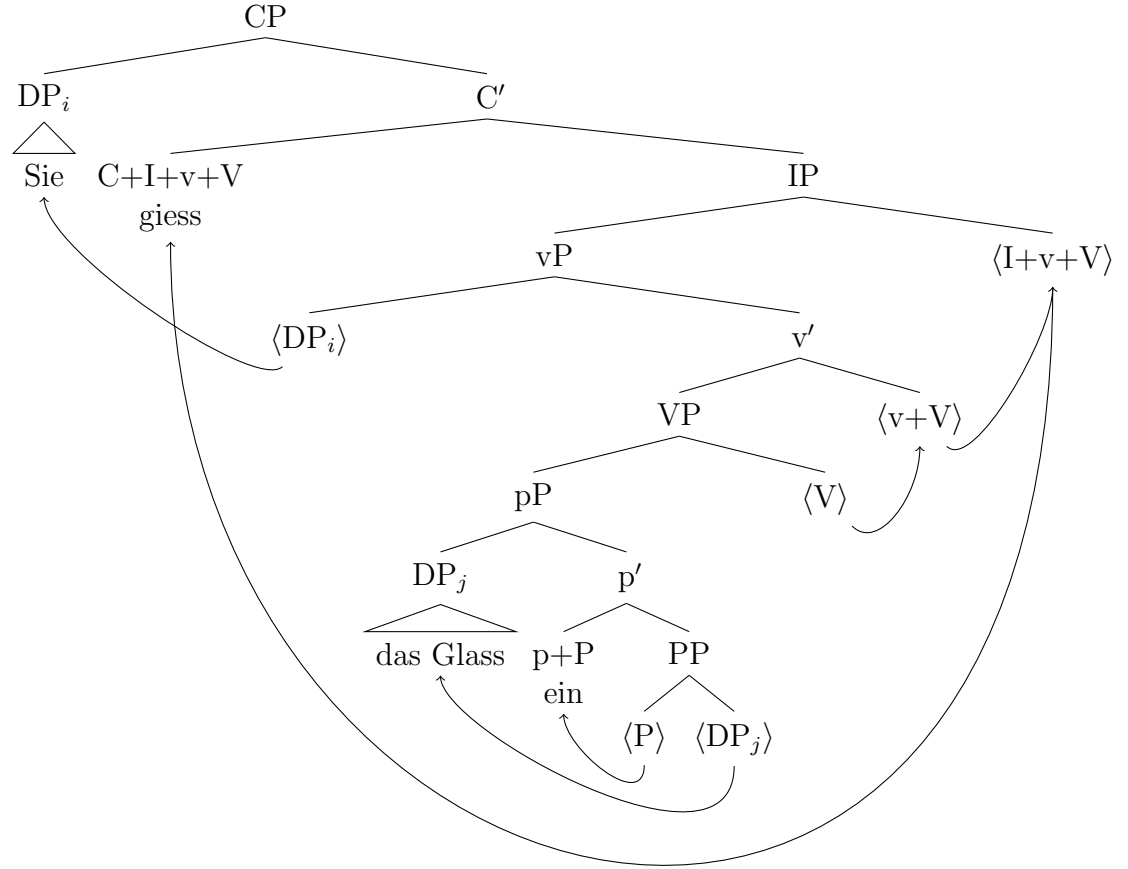
“The woman would like to eat an apple.”

b.



This basic syntactic structure of the German clause, combined with an assumption that verbal particles, unlike those in English, do not move to V, predicts that particles be stranded in final position as shown in (115).

(115)



This variation suggests that p-to-V movement is one of the parameters that English and German differ with respect to.<sup>8</sup> Just as English differs from French and German with respect to V-to-I movement, English and German differ with respect to p-to-V movement. Note also that, as in

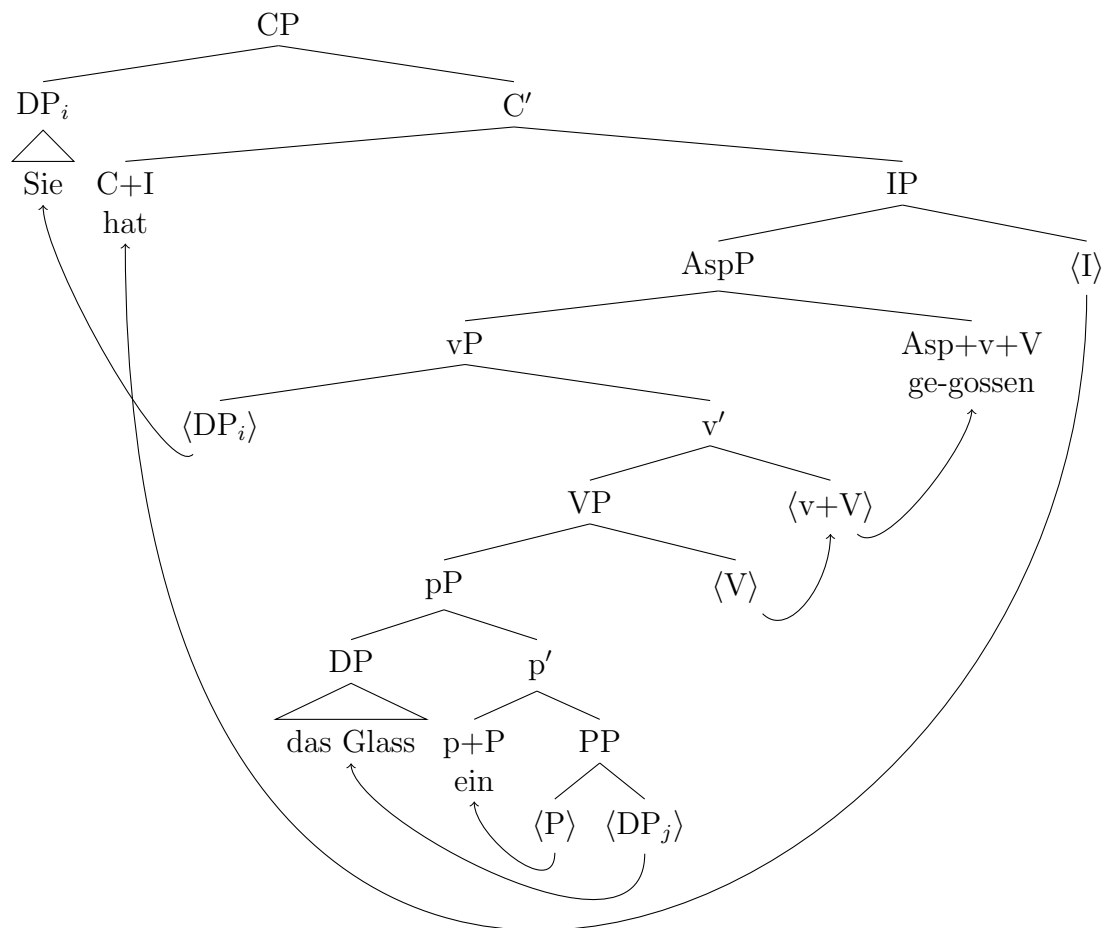
<sup>8</sup>Pinpointing how this parameter is instantiated in the grammar is beyond the scope of this paper.

English, it is crucial that the ground argument move to Spec-p, because the pP in German, unlike the IP, is head-initial.

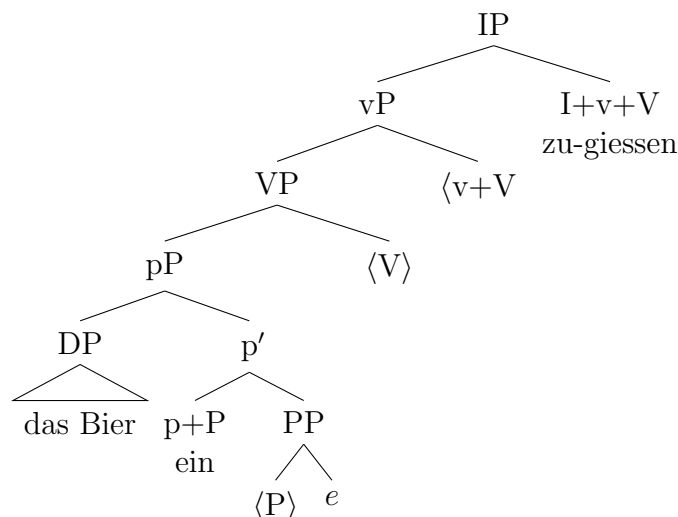
### 3.4.2.2 Intervening morphemes

The intervening morphemes, participial *ge-* and infinitive *zu*, can be explained in this system. If we assume *ge-* is the spellout of a perfect Asp head, which merges between v and I, and *zu* is the spellout of non-finite I, then the relevant PV constructions can be derived as shown below in (116) and (117)

(116)



(117)



That *ge-* is an inextricable part of the participle is uncontroversial, as it is traditionally analysed as a prefix. The Infinitive *zu*, however, being a cognate of and having a similar function to English *to*, is generally seen as a free morpheme. In the above analysis of German *zu*-infinitives, *zu* must form a complex head with the non-finite verb. Empirical support for this comes from the restriction on “split infinitives,” which seems to be a grammatical, rather than a prescriptive one.

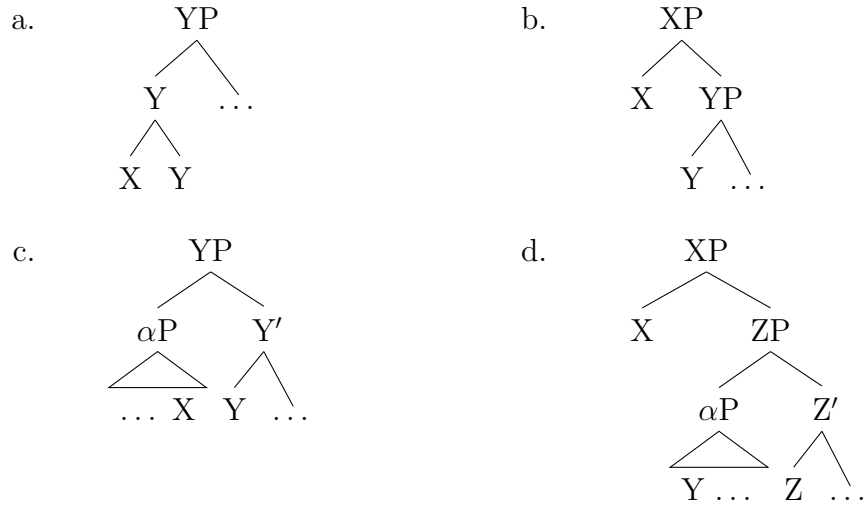
(118) German \*split-infinitive.

- a. Ich plane morgen ein Buch schnell zu lesen.  
    I   plan tomorrow a book quick to read  
    “I plan to quickly read a book tomorrow.”
- b. \* Ich plane morgen ein Buch zu schnell lesen.  
    I   plan tomorrow a book to quick read

If we accept this structure and assume that PVs, when not split for V2 order, surface as single words, we must adopt a non-standard theory of word formation. The standard assumption is that, in order for two syntactic heads to surface in the same morphological word, they must be part of the same complex head at PF (Baker, 1996). According to this standard assumption, if there is a word, *XY*, consisting of two morphemes, it can only arise from a structure like that in (119a). In our structures for German PVs, however, particles and verbs never form complex heads, yet they can surface as morphological words. If we assume, however that

the morphological word,  $XY$ , can surface from any structure in which  $X$  and  $Y$  would surface as linearly adjacent (Julien, 2007), then the PVs in the structures in (116) and (117) can surface as single morphological words. So, allowing for specific word formation rules in a given language,  $XY$  can surface from any of the forms in (119). The structures of German PVs are approximately isomorphic with the structure in (119b).

(119) Possible syntactic configurations for the surface form  $XY$  (Julien, 2007)



Alternatively, It may be the case that German PVs are never morphological words, and their apparent wordhood is purely an artifact of German orthography. This would be the reverse of the situation in English, where, as I argue in section 3.4.1, PVs in the continuous word order are formally complex heads even though they are orthographically represented as separate words.



## Chapter 4

# Residual Issues, Implications, and Conclusion

In this chapter I will discuss a few problems with my account of figure retention and ground promotion constructions and offer possible solutions for these problems before concluding the paper. In section 4.1, I will discuss how my analysis can be constrained such that it only predicts that attested PVs behave like PVs. Section 4.2 will discuss how the apparent optionality of English particle shift can be accounted for. I will also review Newell's (2005) bracketing paradox in light of my account in section 4.3. I then discuss Aspectual PVs and *Aktionsart* in 4.4, and look at idiomaticity among PVs in section 4.5. Finally, in section 4.6 I provide some concluding remarks.

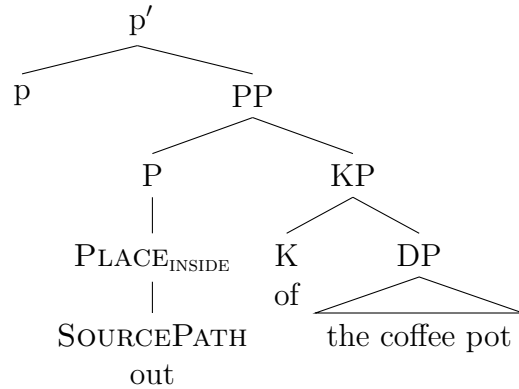
### 4.1 Restricting the analysis to PVs

Not all spatial prepositions that take figures and grounds show the behaviour under investigation in this paper. In fact, figure retention and ground promotion are the exception rather than the rule. In English, ground promotion/figure retention seems to be restricted to the prepositions *out* and *off*

- (120) \*pour the glass in  
**Intended:** “pour something into the glass”
- (121) \*put the table on  
**Intended:** “put something onto the table”

The structure of particles I have argued for is one in which the directional and locative content is encoded on a single head as shown in (122).

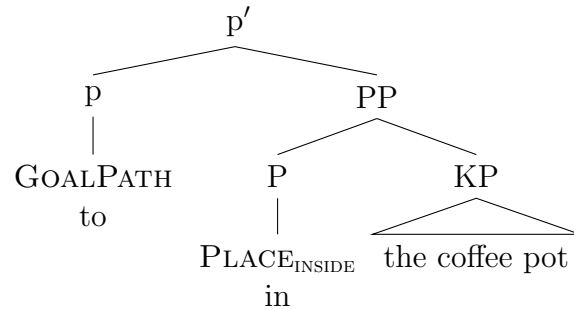
(122) out of the coffee pot



In this structure, different flavours of little- $p$  can be projected without altering the core spatial semantics, as encoded on  $P$ . Depending on which little- $p$  is in the structure, the resulting  $pP$  will be a full expression  $pP$  or, when merged with a verb, a ground promotion or figure retention  $PV$ .

Other directional prepositions (e.g. *into*, *onto*) have their meaning split onto two heads as shown in (123)

(123) into the coffee pot



In structures such as this, little- $p$  encodes spatial semantics and, as such, cannot be replaced by a different flavour of little- $p$  without altering the core spatial semantics. Since a different flavour of little- $p$  is required for the preposition to become a particle, these bipartite prepositions cannot form  $PVs$  with verbs.

The bipartite nature of *into* (as well as *onto*) is morphologically transparent, with *in-* being the exponent of  $P_{PLACE}$ , and *-to* being the exponent of  $p_{PATH}$ <sup>1</sup>.

A bipartite directional preposition has further empirical support from Lestrade et al. (2011), who show that in many of the world’s languages, directional meaning can be expressed by inflection on a spatial preposition. Finnish is one such language, as demonstrated in example (124), where the directional meaning is expressed by the Allative morpheme, *-lle*, which attaches to the spatial preposition *pää*.

(124) Finnish (Lestrade et al., 2011)

Keitä mausteliemi tarkista maku ja kaada kuumana sien-ten  
 cook marinade, check taste and pour while.hot mushroom-PL.GEN  
**pää-lle.**  
 on-ALL

“Prepare the marinade, check the taste and pour it while still hot on the mushrooms.”

## 4.2 The Optionality of p-to-V movement

The most notable property of English particle shift is its apparent optionality. If we wish to give particle shift a syntactic explanation, it must have a way of accounting for the optionality. In the analysis put forth here, particle shift is caused by the movement or non-movement of little-*p* to *V*. Operations like movement in minimalist syntax, however, must have a motivation (e.g. EPP, strong features), and if an operation is motivated, it must occur. In other words, syntactic operations are deterministic in that a given input structure will always have the same output. This means that the two surface orders of PVs must be substantially different in some way

Dehé (2002) provides an account for the choice of the continuous or discontinuous order motivated by pragmatics. Specifically, the focus-background structure of a sentence determines which order surfaces. The focus-background

---

<sup>1</sup> Svenonius (2010) argues for a bipartite structure for all directional. The cartographic theory he works in, however, assumes one head per feature, which would predict that *off* and *out* are also bipartite prepositions. Without the possibility of a structural distinction, it is unclear how such an approach would explain the fact that not all directional prepositions can form ground promotion/figure retention PVs.

structure is a type of information structure which depends on the novelty of the information provided by a given syntactic item. New information is the Focus of a sentence while old information is the Background.<sup>2</sup> For example, in responses to Wh-Questions, the constituent which is targeted by the Wh-word in the question represents new information, and therefore, bears Focus.

(125) **Situation:** Rosie hit Declan.

- a. Maximal focus  
Q: What happened?  
A: [<sub>Focus</sub> Rosie hit Declan.]
- b. Non-minimal focus  
Q: What did Rosie do?  
A: Rosie [<sub>Focus</sub> hit Declan.]
- c. Minimal Focus  
Q: Who did Rosie hit?  
A: Rosie hit [<sub>Focus</sub> Declan.]

Dehé uses the intonation patterns associated with focus to test, experimentally, whether focus and particle shift are correlated. From her findings, she concludes that the discontinuous order (V-Obj-Prt) is associated with contexts in which the object of the PV is not focused (i.e. the Background).

(126) **Situation:** Peter threw away the milk.

- a. Maximal focus  
Q: What happened?  
A: [<sub>Focus</sub> Peter threw away the milk.]
- b. Non-minimal focus (Background Subject)  
Q: What did Peter do?  
A: Peter [<sub>Focus</sub> threw away the milk.]
- c. Minimal Focus (Object focused)  
Q: What did Peter throw away?  
A: Peter threw away [<sub>Focus</sub> The milk.]

---

<sup>2</sup> It should be noted that the term, Focus, has multiple meanings within the field of pragmatics. In addition to “new information” focus, which is important here, there is also contrastive focus, which highlights information that is contrary to the context, and verum focus, which highlights the truth of some information in the context.

## d. Background Object

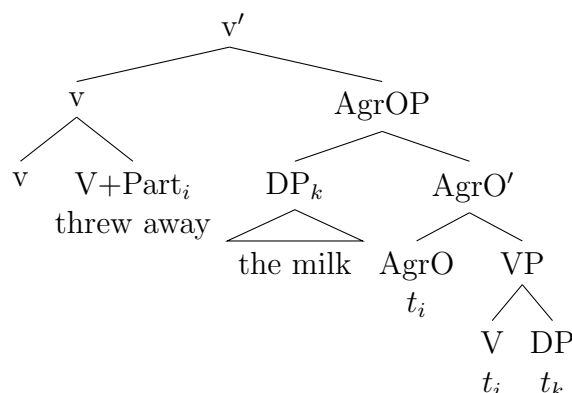
Q: What happened to the milk

A: [<sub>Foc</sub> Peter threw] the milk [<sub>Foc</sub> away.]

The restriction on continuous ordered PVs with pronoun objects, and the preference for continuous order with large DPs as objects can easily be included in Dehé's generalization. Pronouns require a contextually salient referent in order to be used felicitously, and, therefore, necessarily represent background information, while increased modification of a DP (e.g. by Adjectives or relative clauses) tends to increase that DP's *news value* (Dehé, 2002), meaning it is more likely to bear focus.

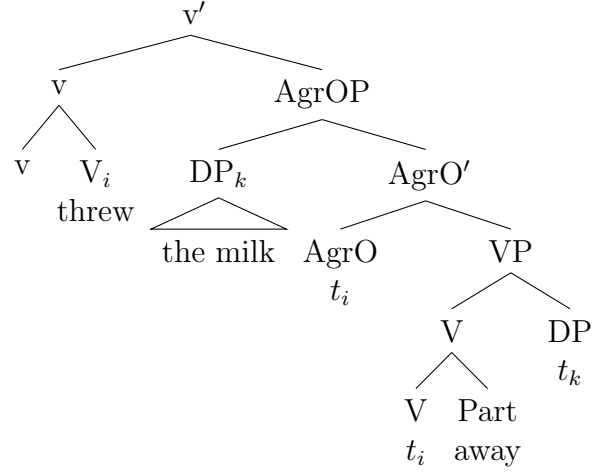
To understand how Dehé formalizes her generalization, I must first describe her analysis of the structure of PVs. She takes PVs to be underlyingly complex heads that project a theme argument in their complement and form a VP. She assumes an AgrO projection, merged directly above the VP which triggers movement of the theme to its specifier for Case. She further assumes a little-v above AgrOP which introduces the agent. Verbs, in the general theory that Dehé assumes, move to little-v, stopping in AgrO first. The discontinuous order surfaces when only the verbal component raises to AgrO and little-v. The surface structures of the two orders of PVs are given below in (127a) and (127b), below.

- (127) a. Continuous order (Dehé, 2002)  
threw away the milk



- b. Discontinuous Order (Dehé, 2002)

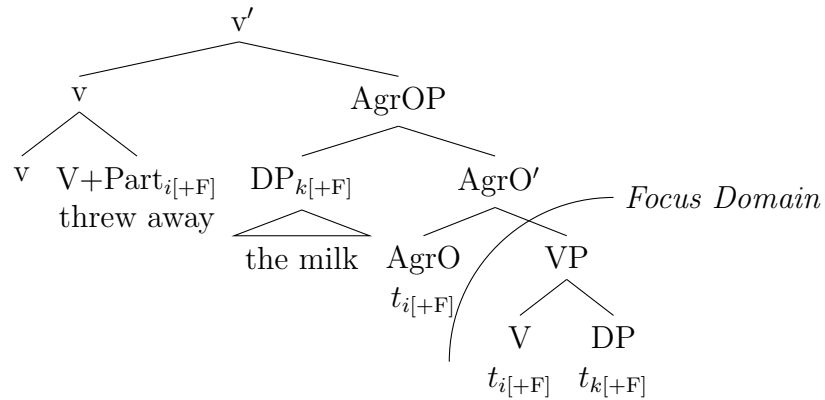
threw the milk away



Dehé argues that Focus is represented syntactically by a binary feature,  $[\pm F]^3$  which is placed on every head in the syntax. Also important to her analysis is the notion of a “Focus domain,” which is the maximal projection that dominates the base generated positions of all of the  $[+F]$  nodes, as shown in the trees in (128) below.

(128) English particle shift (per Dehé, 2002)

- a. Non-minimal focus  
Q: What did Peter do?  
A: He threw away the milk.

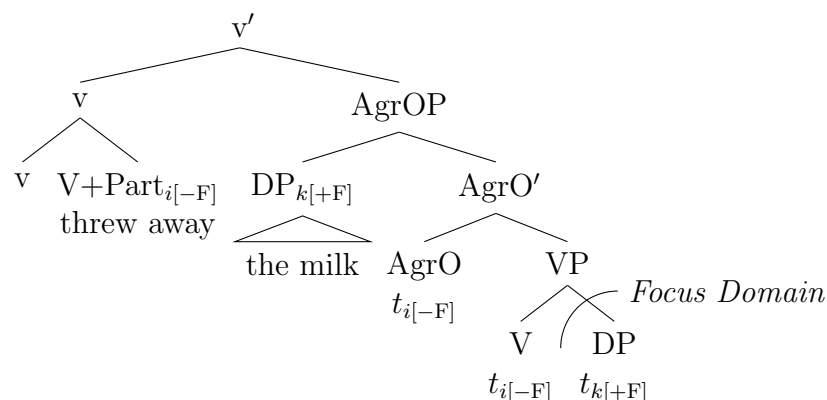


<sup>3</sup> Dehé (2002) notes that this feature is not a formal feature and as such does not require checking to avoid crashes.

## b. Minimal focus

Q: What did Peter throw away?

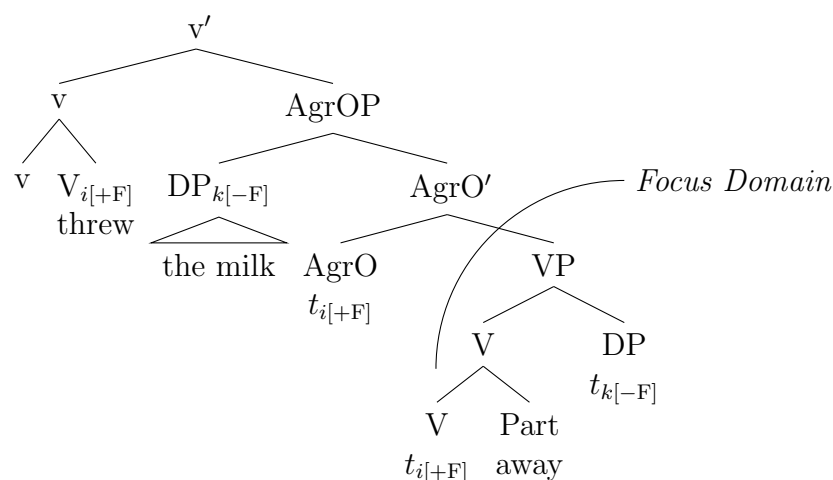
A: He threw away the milk.



## c. Non-minimal focus, Background object

Q: What did Peter do with the milk?

A: He threw the milk away.



The tree in (128c) shows the structure which surfaces in the discontinuous order. Note that it is the only structure whose focus domain contains a  $[-F]$  element, a fact that Dehé exploits in her final analysis. To explain the facts of English particle shift Dehé formulates a “condition on focus domains,” reproduced below in (129).

- (129) *Condition on Focus Domains:* (Dehé, 2002)  
Within a focus domain, a [+F] focus feature must be bound by some kind of verbal affix if there is a mismatch with regard to focus features.

As it is stated, Dehé's condition is an interface condition. Rather than being a restricting an operation (like Island Constraints on movement), it represents a criterion for the derivation's convergence at an interface (PF in this case). Given her complex head analysis, this condition allows Dehé to derive the information structure facts of particle shift.

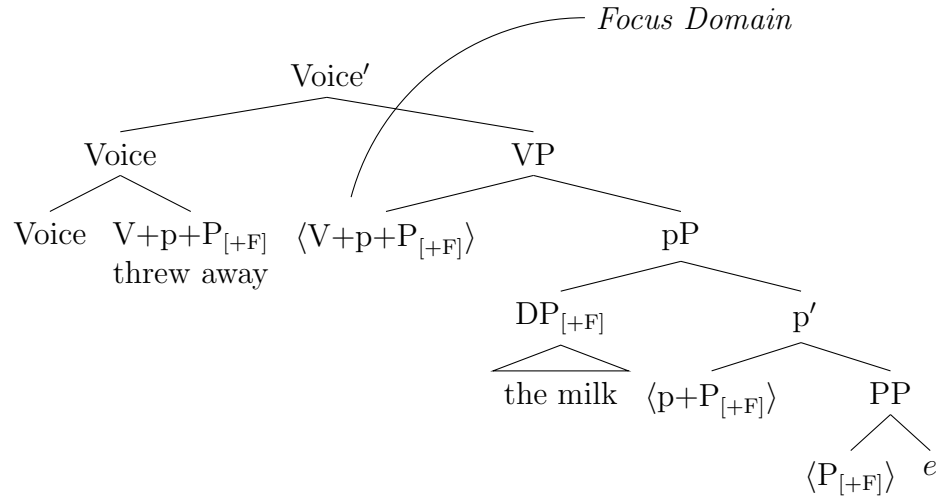
The insight behind Dehé's condition, that the discontinuous order results from a focus feature mismatch, is also able to derive the information structure facts in the analysis I have argued for above. When there is no mismatch in the focus domain, as in (130a), the particle may surface with the verb on Voice, outside the focus domain. The structure in (130b), however, shows a clash in the focus domain, which leads to the discontinuous order.

- (130) Focus Domains in a pP analysis

a. Non-minimal focus<sup>4</sup>

Q: What did Peter do?

A: He threw away the milk



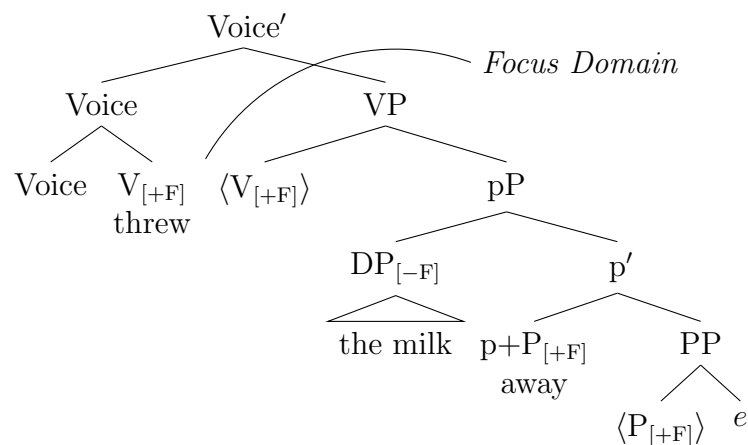
<sup>4</sup> Since Peter's agency, which is encoded by Voice, is included in the question, I take Voice to be outside the focus domain.



- b. Non-minimal focus, Background object

Q: What did Peter do with the milk?

A: He threw the milk away.



Unlike in Dehé's structure, the operation responsible for determining which word order surfaces, p-to-V movement, does not move the p+P complex out of the focus domain. As such, the condition on particle movement, as defined in (129), can place no restrictions whatsoever on the initial move. It is not until V-to-Voice movement that the condition can restrict movement. At this point, however, p-to-V movement has already occurred, so we should expect to see only the continuous order surface.

With the copy theory of movement, however, the condition can be reformulated to require that the lower copy of the particle be pronounced when there is a mismatch. This would mean that p-to-V movement always occurs when it can in the syntax, effectively rendering the optionality of particle shift a phonological phenomenon.

Relegating choice of word orders to a PF operation is not explanatory though. Lacking a syntactic explanation for the optionality, a morphophonological one is needed. This, however is beyond the scope of this paper, and further research would be necessary to determine what morphophonological motivations drive this choice.

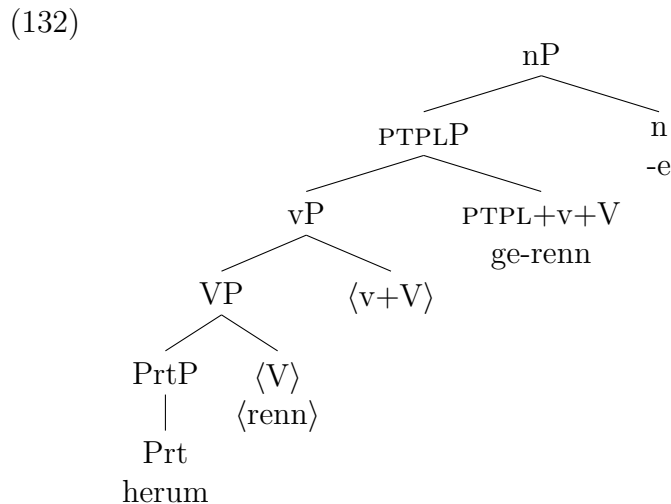
### 4.3 The bracketing paradox - revisited

Recall in section 2.2.3, I discussed the hypothesis, proposed by Newell (2005, 2008), that particles in German are late adjuncts. The central observation that this hypothesis was designed to explain was a bracketing paradox in the nominalized participles of German PVs, demonstrated below in (131).

- (131) a. Morphological bracketing (=57a)  
[herum [ge [renn] e]]  
b. Semantic bracketing (=57b)  
[ge [herum [renn]] e]

According to Newell, the particle is interpreted as being local to the verb despite the fact that other morphology intervenes between the two.

The analysis I have argued for is able to capture this paradox, provided the verb is interpreted in its base generated position. Consider structure for *herumgerenne*, below in (132).



In the above tree (cf. example (116)), the particle merges in the complement of V rather than as an adjunct. The verb then raises cyclically through little-v to PTPL where it is pronounced without the particle adjoined to it. The c-commanding nominalizing head is pronounced as the suffix *-e*. Although the verb root *renn* is pronounced in its higher position, the base generated copy (i.e. in V) is the one interpreted at LF. Not only is this structure capable of explaining the bracketing paradox, it exploits the same displaced interpretation of the verb that Newell does. In fact, with the

caveat that *herum* is the complement of V rather than an adjunct, the structure I argue for is very nearly identical to the one Newell argues for, as reproduced in (60).

## 4.4 Aspectual PVs

In chapter 2, I argued that McIntyre was able to find counterexamples to almost every argument in favour of either side of the verb-dependency/anti-verb-dependency debate only because he was comparing across the different types of PVs. To avoid this issue, I have only focused on one class of PVs: ground promotion. In this section, I will return to one of the other PV classes that McIntyre identified: aspectual PVs.

While figure/ground PVs were amenable to analysis due to their similarity to full expression spatial pPs, aspectual PVs have no such counterpart to be compared with and can be either transitive or intransitive as shown below.

- (133) a. sing (\*the entire song) along  
       b. think the matter \*(through/over)  
       c. Gabi will    das Problem \*(an)-denken  
           Gabi wants the problem at-think  
           “Gabi wants to start thinking about the problem.”

Given the variability of the argument structure of aspectual PVs, it is not immediately clear that a unified account can be given. Just as ground promotion/figure retention PVs became more transparent when we compared them to figure/ground pPs, investigating aspectual PVs with special attention to their *Aktionsart* may yield results. Consider the examples below with respect to their *Aktionsart*.

- (134) a. sing the entire song [for an hour/in an hour] (telic/atelic)  
       b. sing along [for an hour/\*in an hour] (atelic)  
       (135) a. think [for an hour/\*in an hour] (atelic)  
           b. think the idea through [for an hour/in an hour] (telic/atelic)

The function of aspectual particles is to alter the *Aktionsart* of the verbs with which they appear. Investigating *Aktionsart* can shed light on the argument structure of aspectual PVs because it is often linked to the internal

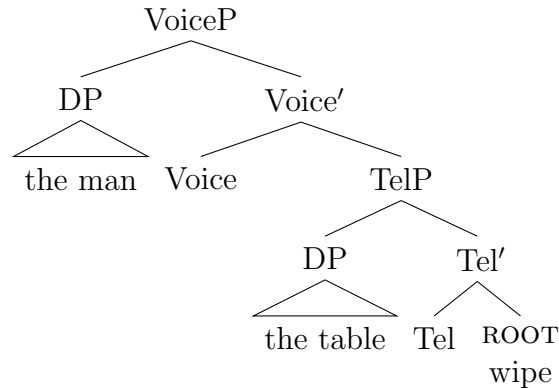
argument (or lack thereof) of a verb (Levin and Rappaport Hovav, 2005; Borer, 2005). Consider the sentences in (136).

- (136) a. *telic*  
We ate **a loaf of bread** in 20 minutes.  
b. *atelic*  
\*We ate **bread** in 20 minutes.

In the two clauses above, the difference between a mass and a count noun as the internal argument translates to a difference of telicity. In general, the telicity of transitive verbs is dependent on the boundedness of their themes.

Borer (2005) proposes a theory of argument structure in which all arguments are introduced by functional heads. In her system, lexical verbs are inherently unspecified for argument structure, and themes are introduced by a head that specifically relates the *quantity* (cf. boundedness) of the theme to the quantity of the eventuality described by the verb. That is to say, the functional head that introduces the theme also defines the telicity of the verb (For a similar proposal, see Kratzer, 2004). A transitive VoiceP, assuming this part of Borer's theory,<sup>5</sup> would have the structure below (where Tel is the theme-introducing telicity head).

- (137) The man wiped the table.



This notion that aspect-determining heads are responsible for argument introduction, combined with the notion, argued for in this paper, that particles can introduce arguments, suggest a possible link between the argu-

<sup>5</sup> The proposals that all arguments are introduced by functional heads and that the theme-introducing head encodes telicity are part of a full theory of syntax which Borer (2005) outlines in a three-volume work.

ment structure of figure/ground PVs and that of aspectual PVs. Given their aspect-determining function, it is possible that aspectual particles are realizations of Borer’s telicity heads. The fact that aspectual PVs show variability with respect to argument structure, then, would follow from the fact that aspectual particles are responsible for the introduction (or non-introduction) of the internal argument.

Although ground promotion PVs and aspectual PVs differ significantly with respect to argument structure, they have the same syntactic behaviour (i.e. particle shift in English and separability in German), so it is reasonable to expect they show some commonalities in their syntactic structures. Crucial to my syntactic analysis of figure/ground PVs was that particles merge in the complement of the verbs with which they appear. According to Borer’s theory, however, the telicity head merges above the verb. If the proposal that aspectual particles are overt telicity heads is to be pursued, Borer’s framework will have to be adapted to allow telicity heads to merge in the complement of the verb.

## 4.5 Idiomaticity

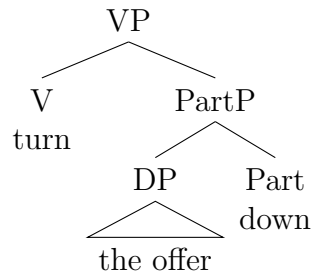
In English and German, many PVs have idiomatic meaning. Some PVs are partially idiomatic, meaning one component (either the particle or the verb) retains its canonical meaning, but the combination is not interpreted compositionally. Take, for example, *look up*, whose meaning (“consult; seek information”) is related to that of its verbal component, but is not recoverable by merely combining the meanings of both components. Other PVs, however are completely idiomatic. For example, as shown below in (138), the German PV, *anfangen*, has a meaning completely unrelated to that of its constituent parts.

- (138) an- fangen  
       at- catch/trap  
       “begin/start”

Idiomaticity would be easy to account for given a Complex head analysis; one would simply need to stipulate that idiomatic PVs are stored as such in the lexicon. According to the theory of PVs argued for in this paper, not only are PVs not stored as single lexical items, they don’t even form syntactic constituents. Each component of an idiomatic PV projects its

own phrase and, in the case of transitive PVs, the particle introduces an argument which is not interpreted idiomatically. For example, the PV, *turn down* (=“reject”) is transitive and idiomatic, meaning its VP would have a structure like that in (139), below.

(139) *turn the offer down*



Constituency, however, is not a requirement for idiomatic interpretation. Bruening (2010) gives several examples, some of which are given below in (140), that show idioms which, like idiomatic PVs, do not form constituents.

- (140) a. Get X’s goat  
b. a little bird told X  
c. pull {some discreet/a few/yet more} strings

(Bruening, 2010)

Bruening formulates a principle of idiom interpretation, defined below in (141), based on selection rather than constituency.

- (141) *The Principle of Idiom Interpretation* (Bruening, 2010)  
X and Y may be interpreted idiomatically only if X selects Y.

It is reasonable to assume that, since verbs and particles are in a Head-Comp relationship, one head selects the other. Therefore PVs may be interpreted idiomatically.

## 4.6 Conclusion

In this paper, I have endeavoured to answer the question asked by McIntyre (2007): “Are direct arguments arguments of particles or verbs?” I have argued here that, in the case of ground promotion and figure retention PVs, the direct objects are arguments of particles. More accurately, the particles

in question are actually defective prepositions which project an extended prepositional phrase (pP) and take the direct object as an argument. I discussed the fact that there is an asymmetry between ground promotion and figure retention PVs with respect to their interpretation and argued that this asymmetry is reflected in an a structural asymmetry in the pP that introduces the figure and ground arguments I have provided a semantic and account of the relevant PVs that explains the semantic underpinnings of the pP, and a syntactic account which explains the fact that, despite their structural asymmetry, figure retention and ground promotion PVs show identical syntactic behaviour in English (particle shift) and German (separability)

There are a number of puzzles that have been identified by my analysis of ground promotion PVs While I argued that the choice between word orders in English PVs, though triggered by information structure, is a function of morphophonology, I did not explore possible morphological or phonological factors in the choice. Also, I argued that ground arguments are present, though unexpressed, in figure retention PVs, but did not fully identify the nature of these implicit arguments Lastly, I was unable to precisely define the semantic function responsible for introducing a figure argument into a directional expression.

More generally, my hope is that this study might inspire further research into the other classes of PVs. I have shown that starting from explicit assumptions regarding the relationship between syntax, semantics and argument structure, and limiting my inquiry to one natural class of PVs can yield much better results than treating all PVs as a monolithic class.





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# Directionalized locatives

## A label theoretic account

Daniel Milway

December 17, 2014

### 1 Introduction

Studies in the syntax and semantics of spatial prepositions traditionally divide them into two classes: locatives and directionals. Locative prepositions are those, such as *beside*, *above*, *inside*, *between*, *etc.*, which describe a static spatial relationship, while directional prepositions, such as *into*, *towards*, *from*, *etc.*, describe a dynamic spatial relationship. A subset of locatives, when combined with motion verbs, display an optional directional interpretation. Consider (1), below.

- (1) Kulap ran between the posts ...
- a. for an hour.
  - b. to get home.

While the fact that some locative prepositions can be *directionalized* (Zwarts and Winter, 2000) has been noted, the phenomenon has not been thoroughly investigated. When directionalization is addressed, the explanations go no further than stipulating the presence of a directional operator (Zwarts and Winter, 2000) or a functional projection (Svenonius, 2010). These types of *just-add-structure* analyses lead to a question that this paper will attempt to answer: Is the simple adding of structure sufficient and necessary to explain phenomena surrounding directionalized locatives? In this paper, I argue, based on the English directionalization data, that the ambiguity between directionalized and located motion readings of

cannot be reduced to a simple difference in the functional structure of the PP in question, but must be the result of a structural ambiguity.

The investigation is structured as follows. First I give a fuller presentation of the directionalization data in section 2 including the ambiguity between directionalized and located motion readings. Next, in section 3, I discuss the previous accounts of directionalization and show that the simple *just-add-structure* approach is problematic given the assumptions about syntax and semantics they rest on. Section 4 discusses my account of the ambiguity and the syntactic and semantic implications of that account. Not all languages have directionalized locatives, however. In section 5 I will compare English with French, a language without directionalized locatives, and provide a syntactic explanation of this disparity between the two languages. Finally, in section 7 I sum up the investigation and make some concluding remarks.

## 2 The Data

## 2.1 Basic Data

Only a handful of English locative prepositions can clearly be directionalized. For the purposes of this paper I consider the set of directionalizable prepositions to be *between*, *behind*, *in front (of)*, and *under*<sup>1</sup>. These prepositions are also all ambiguous between directionalized and located motion readings as demonstrated below.

- (2) a. Anna ran between the pylons ...  
       (i) on her way to the endzone. (Directionalized)

<sup>1</sup>This is very likely not an exhaustive set of the directionalizable locatives, but rather the set of prepositions for which the locative-directionalized contrast is clearest. For example, *over* is not included in this list because even when it is used in a stative context, it is ambiguous between a normal place interpretation as in (i-a) and what Svenonius (2010) calls Cresswellian places which describe a place at the end of a path as in (i-b).

- (i)     a.    The moon hung over the mountain.  
          b.    My house is over the next hill.

The fact that *over* has a directional component in stative contexts would be a confound on this data.

- (ii) for an hour. (Located Motion)
- b. Jakub walked behind the shed ...
  - (i) which hid him from our view for a moment. (Directionalized)
  - (ii) for an hour. (Located Motion)
- c. Berit swerved in front of cyclists ...
  - (i) causing them to brake suddenly. (Directionalized)
  - (ii) for a kilometer. (Located Motion)
- d. Rick ran under the awning ...
  - (i) as soon as he saw lightning. (Directionalized)
  - (ii) for his warm-up. (Located Motion)

## 3 Previous Literature

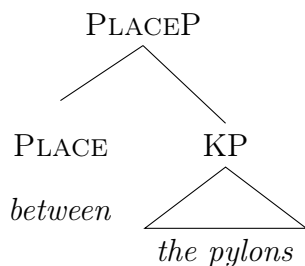
### 3.1 Recent Work on Spatial PPs

The past two decades have seen the formation of a body of literature on the syntax and semantics of spatial expressions. Much of the syntactic work has been within the cartographic approach which seeks to identify the functional sequence of a given domain (*e.g.*, the papers contained in Cinque and Rizzi, 2010). In this section I will first outline an analysis of English spatial P under the cartographic approach (Svenonius, 2010). I will then discuss some problems with how this approach treats directionalized locatives.

#### 3.1.1 The syntax of Spatial PPs (Svenonius, 2010)

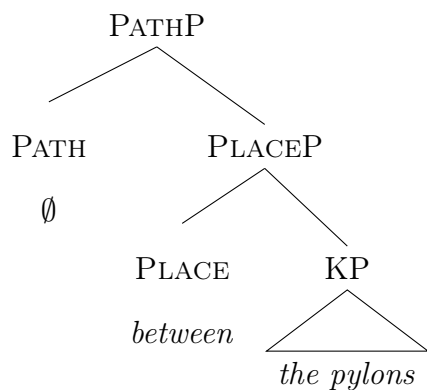
The approach to directionalized locative PPs put forth by Svenonius (2010) treats directionalization as the result of a phonologically null PATH head merging with the PLACEP that the locative P projects.

- (3) a. Locative PP



- b. Directionalized PP

(following Svenonius, 2010)



As evidence for this null PATH head, Svenonius points to the fact that *to*, which he takes to be a non-null exponent of the PATH head, does not combine well with the locative prepositions that can be directionalized.

- (4) a. The boat drifted (?to) behind the hill.  
 b. The boat drifted (?to) inside the cave.  
 c. The boat drifted (?to) below the bridge.  
 d. The boat drifted (?to) beyond the city limits.  
 e. The boat drifted (?to) in front of the palace.  
 f. The boat drifted (?to) above the dam.  
 g. The boat drifted (?to) six miles up the river.



### 3.1.2 How spatial PPs combine with verbs

In-depth syntactic studies into prepositions tend to stop at the extended prepositional domain. They do not offer any particular insight into how these extended PPs might combine with verbal or nominal structure.

The current approach to directional modification, as in Zwarts (2006); Ramchand (2013), takes directional PPs to be converted to properties of eventualities via a SHAPE predicate<sup>2</sup>. A spatial PP, when modifying a verb, is interpreted as picking out the eventualities whose shape matches the path defined by the PP. This is formalized below.

$$(5) \quad \llbracket V \text{ PP} \rrbracket = \{e \in \llbracket V \rrbracket : \text{SHAPE}(e) \in \llbracket \text{PP} \rrbracket\} \quad (\text{Zwarts, 2006})$$

Put in the context of directionalized locatives, the very general nature of this modification means that the ambiguity between located motion and route/goal interpretations must be the result of the structure of the PP. What is not made explicit in current accounts of directionalization is the status of the located motion reading of locatives. There are two possible syntactic analyses of located motion. Located motion could arise from the combination of a verb and a PLACEP, in which case the PP would define the location of an event, or it could be the result of fourth flavour of PATH head which defines the set of paths which are entirely located (as opposed to starting, ending, or passing through) at the place defined by the PLACEP that it merges with. If located motion PPs are PLACEPs, we would expect them to show different distribution from unambiguous PATHPs, while they would pattern with unambiguous PATHPs if they too were PATHPs.

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<sup>2</sup>Zwarts (2006) uses a SHAPE predicate, while Ramchand (2013) uses a TRACE predicate, though both predicates seem to serve the same function of defining the path associated with a given event.

## 3.2 Problems with the standard account

### 3.2.1 *Halfway*-modification

Let's consider the just-add-path approach to directional prepositions in light of the interpretation of unambiguous locatives and directionals when modified by *halfway*. When *halfway* is adjoined to directional PPs, as in (6) below, it is interpreted as modifying the path denoted by the PP.

- (6) a. Alma jogged halfway to the store.  
b. Henk drove halfway through the woods.

In (6-a) Alma followed a path that ends up at the store, but only traversed half of that path. Similarly, in (6-b), Henk followed a path that goes from one edge of the woods to the opposite edge, but only traversed half of that path. *Halfway*, then, can modify paths.

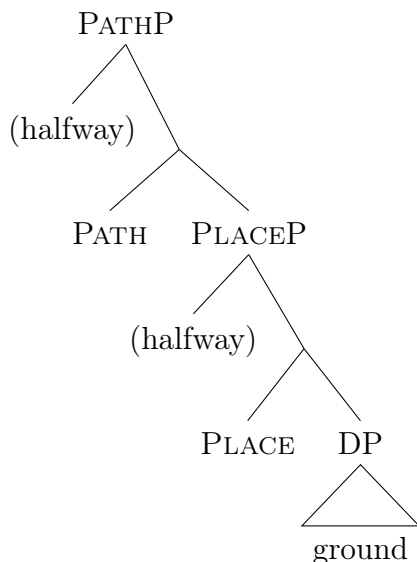
When adjoined to locative PPs, it is interpreted as modifying either the figure or place denoted by the PP, depending on the preposition.

- (7) a. The goalie stood halfway between the posts.  
b. The dog was halfway inside the house.

In (40-a) the goalie stood in a spot, such that each of the posts was equidistant to her. In (7-b) half of the dog is inside the house, while the other half is not. Although the actual interpretation of locative PPs, when modified by *halfway* varies depending on the preposition, the fact remains that locative PPs can, just like directionals, be modified by *halfway*.

Under an account in which directionality is encoded by a functional layer (PATH) on top of a locative PP (PLACEP), the fact that *halfway* can modify both locatives and directionals would mean that the modifier could adjoin either in the locative projection or in the directional projection.

- (8) The structural positions of *halfway* (following Svenonius (2010))



Since directionalized locatives are merely PLACEPs that merge with a null PATH head in this account, we expect them to behave as directionals with respect to *halfway* modification. This prediction is not borne out. Consider the directionalized locatives below.

- (9) a. Brigid ran halfway between the pylons.  
 b. the ball rolled halfway behind the screen.

In (9-a) we expect to, at least optionally, interpret this as *halfway to between the pylons*. This interpretation, however, is not available. Instead (9-a) is interpreted as asserting that Brigid ran and ended up halfway between pylons ( $\approx$  *Brigid ran to halfway between the pylons*). The same is true of (9-b), which means that the ball rolled, ending up with half of it concealed behind the screen ( $\approx$  *The ball rolled to halfway behind the screen*).

Svenonius (2010) makes a testable prediction regarding modification of spatial PPs: that a modifier capable of modifying both locatives and directionals should also modify the directional component of directionalized locatives. In this section I have shown that *halfway* is such a modifier. Contrary to the prediction made by Svenonius' model, *halfway* does not modify the directional component of directionalized locatives. This suggests that, if directionalized locatives have a directional component, it must combine with the locative in such

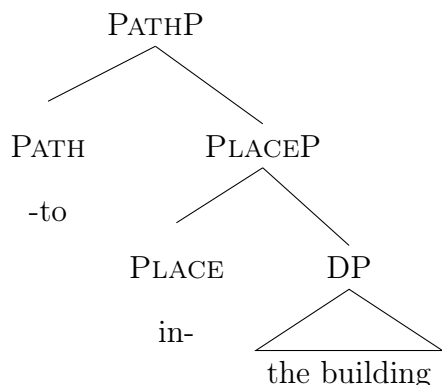
a way that it is unmodifiable by *halfway*.

### 3.2.2 Semantic Type Mismatch

Svenonius (2010) explicitly assumes the vector-space semantics of Zwarts and Winter (2000) for spatial prepositions. While there are many points of agreement between the two systems, an attempt to map Svenonius' syntax to Zwarts and Winters' semantics results in a type mismatch. Just as Svenonius proposes that directional PPs are a different syntactic category from locative PPs (PATHPs vs. PLACEPs, respectively), Zwarts and Winter propose that their respective denotations are of different types (paths (type  $d$ ) vs places (type  $l$ ), respectively<sup>3</sup>). The two systems also agree that locative Ps combine directly with the Ground DP. In the syntax, PLACE selects a DP; in the semantics the  $\llbracket \text{PLACE} \rrbracket$  is a function from entities to places (type  $\langle e, l \rangle$ ). The objects responsible for directionality, however, are where the mismatch arises. For Svenonius, PATH selects PLACEP and projects a PATHP. For Zwarts and Winter directionality is defined by an operator *dir* which combines with locative function ( $\llbracket \text{PLACE} \rrbracket \in D_{\langle e, l \rangle}$ ) and returns a function from entities to paths (type  $\langle e, d \rangle$ )

To demonstrate the mismatch, consider the directional PP *into the building*. The syntactic structure of the PP, in Svenonius' system, is given below.

(10) *into the building*




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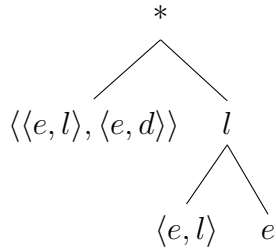
<sup>3</sup> The discussion herein of the spatial semantics argued for by Zwarts and Winter (2000) is for the sole purpose of exposing a predicted type mismatch. As such the semantic system is presented at a high level of abstraction, obscuring the details of the vector-space theory.

If we make the standard assumption that there is a one-to-one mapping between the base-generated syntactic structure and semantic interpretation Svenonius' lexical items have denotations of the types given below.

- (11) The semantic inventory
- a.  $\llbracket the\ building \rrbracket \in D_e$
  - b.  $\llbracket PLACE \rrbracket \in D_{\langle e, l \rangle}$
  - c.  $\llbracket PATH \rrbracket \in D_{\langle \langle e, l \rangle, \langle e, d \rangle \rangle} (= dir)$

If we take these denotations and attempt to compose them in the order predicted by Svenonius' syntax, we see that a type mismatch arises when we attempt to compose the PATH head (type  $\langle \langle e, l \rangle, \langle e, d \rangle \rangle$ ) with the PLACEP (type  $l$ ). This type mismatch is demonstrated below.

- (12) Semantic type mismatch predicted by Svenonius (2010)

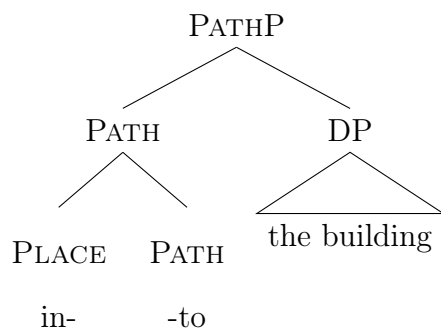


The directional operator, as encoded by the PATH head, must combine with a function from entities to places, which is the type of the locative preposition. The semantic object that results from the combination of the directional operator with the locative preposition is a function from entities to paths, meaning that it combines with the ground DP and results in path denoting expression. The proper order of semantic operations is shown below.

- (13)
-

In order to retain the syntax-semantics isomorphism and retain Zwarts & Winter's semantics, we must alter the syntax. PATH and PLACE must form a complex head which selects the Ground DP as a complement.

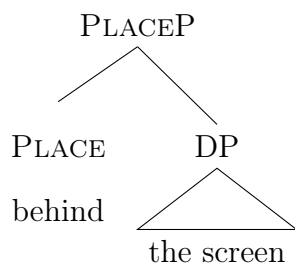
(14) *into the building* (revised)



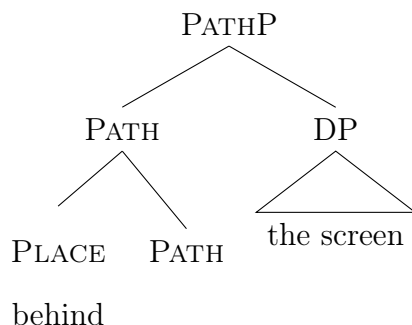
At first glance this modification seems to retain the basic claim of Svenonius' account of directionalized locative: that a PATH head is responsible for the directional interpretation of locatives. In the sentence *Jamie ran behind the screen*, then, *behind* would be ambiguous between a PLACE head and a PATH+PLACE complex head.

(15) Jamie ran [behind the screen.]

a. Located Motion



b. Directionalized



This modified just-add-path account, though it solves the type mismatch problem, makes the wrong prediction with respect to *halfway*-modification. In section 3.2.1, we saw that, contrary to Svenonius’ proposed structure for directionalized PPs, which predicts that *halfway* should optionally modify either the PLACEP or the PATHP, *halfway* is only interpreted as modifying the locative preposition. If directional Ps are complex heads, we would expect *halfway* to be interpreted as path-modifying only, since PLACE does not project a position for *halfway* to adjoin to.

### 3.2.3 Summary

In this section I have demonstrated two issues with the just-add-path approach to directionalization put forth by Svenonius (2010). The first problem is that spatial modifiers like *halfway*, which can modify locatives and directionals, are only interpreted as locative-modifying in directionalized contexts. Svenonius’ just-add-path account, however, predicts that *halfway* would optionally be interpreted as path-modifying. In addition to the empirical problem of *halfway*-modification, the just-add-path account also faces a theoretical issue at its interface with semantics. Given the semantics assumed in Svenonius’ account (Zwarts and Winter, 2000), the syntactic structure proposed by Svenonius for directional PPs would lead to a type mismatch in the semantic computation. Furthermore, an attempt to fix the type mismatch leads to the false prediction that *halfway* will only be interpreted as path-modifying.

## 4 A Proposal: Directionalized locatives and resultatives

As discussed above, proposing a null PATH head to account for directionalized locatives leads to some problematic predictions. In this section I will show that a null PATH head is not needed to account for the phenomenon under investigation here. Rather, located motion PPs and directionalized locative PPs are all PLACEPs, and their interpretations are due to their structural positions.

## 4.1 Located Motion

In this section I will show that the located motion interpretation of motion verb + PP constructions arises due to a higher attachment site for the PP. As will be demonstrated below in section 4.1.1, when interpreted as a locative, the PP adjoins to VoiceP. Given the structure I argue for, I show in section 4.1.2 that the located motion interpretation arises when the locative PP modifies the entire event described by the VoiceP.

### 4.1.1 Syntax

First I will discuss the located motion reading of locative PPs, as the English data provides clearer environments for its emergence. While the availability of the directionalized reading of locatives seems to imply the availability of the located motion reading, the opposite implication does not hold ( $\text{DIR}(S) \implies \text{LOC}(S)$ , but  $\text{LOC}(S) \not\Rightarrow \text{DIR}(S)$ ).

### PP Fronting

When a locative PP is sentence-initial with neutral intonation it is unambiguously interpreted as locative. Note, this is not necessarily true of topicalized PPs or instances of locative inversion. In the PP-S-V ordered sentences, as in (16), the PP is what Maienborn (2001) refers to as a *frame setting* modifier.

(16)    **Fronted PP  $\rightarrow$ located motion**

- a.    Behind the building, Andrew dances  
      ...but in front of it, he stands perfectly still.
- b.    Between the nets, the players run  
      ...but elsewhere they like to relax.

In the above examples, the PP has the effect of restricting the spatial world in which a given assertion is true. For instance, to utter (16-a) is not to commit to the truth or falsity of *Andrew dances behind the building*; rather the utterance can also be interpreted as describing



the beliefs or attitudes of people behind the building with respect to the proposition that Andrew dances.

Of primary importance here is that directionalized interpretations of these PPs are unavailable when the PP is structurally high. In PP topicalization and locative inversion, however, the directionalized interpretation is available because those constructions involve movement of the PP.

(17) **Topicalization**

Mary didn't intend on skating between the pylons,  
but between the pylons she skated (locative/directionalized)

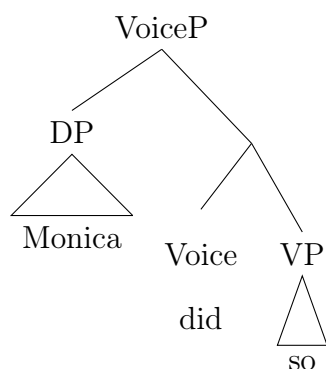
(18) **Locative inversion**

Behind the building ran Joe (locative/directionalized)

***Do-so* insertion**

Lakoff and Ross (1976) provide an early discussion of *do so* in which they analyse it as the pro-form of VP. For them, VP is the constituent that contains the lexical verb and its complement, but crucially not the thematic subject. In a more current theory of phrase structure, the VP would correspond roughly to Voice and its complement, as represented in (19) If an adverbial can modify *do-so*, it must merge with or above a projection of Voice.

(19) **The structure of *do so***



Consider the following examples of *do-so* replacement and locative PPs

(20) ***Do so* insertion → located motion**

- a. Irene danced next to the car, and Andrew did so behind the building.
- b. The soccer players ran between the nets and the sprinters did so on the track

In both of these cases, the locative PP that modifies *do-so* can only be interpreted as a locative, rather than a directional. In (20-a), *did so behind the building* is interpreted as *danced* [<sub>loc</sub>*behind the building*]. In (20-b), *did so on the track* has two possible interpretations: *ran* [<sub>loc</sub>*on the track*], and *ran* [<sub>dir</sub>*between the nets*] [<sub>loc</sub>*on the track*]

If the locative-directionalized ambiguity were simply a lexical ambiguity, as Svenonius (2010) and Zwarts and Winter (2000) assume, we would expect locatives adjoined to *do so* to remain ambiguous. On the contrary, we see that locative PPs are restricted to their locative interpretation when they modify *do so*. We also see that when locative PPs are interpreted as directional in the first conjunct of *do so* examples, that directionalized PP is part of the constituent replaced by *do so* and the PP in the second conjunct is interpreted as locative. This interpretation pattern is shown below in (21).

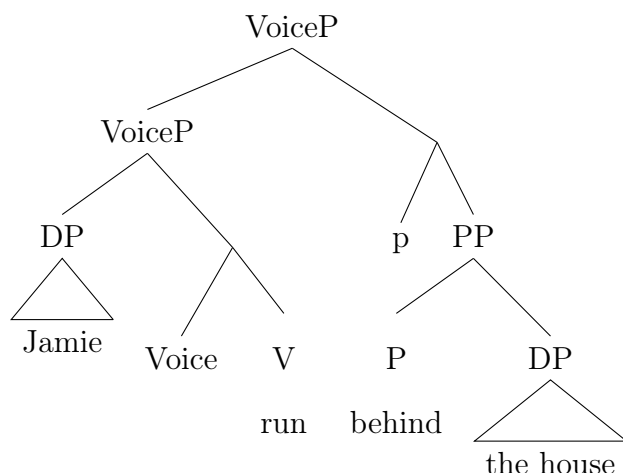
(21) X V PP1 *and* Y *do so* PP2.

[[V PP1]]	[[ <i>do so</i> PP2]]
V PP1 <sub>LOC</sub>	V PP2 <sub>LOC</sub>
	*V PP2 <sub>DIR</sub>
	*V PP1 <sub>LOC</sub> PP2 <sub>LOC</sub>
	*V PP1 <sub>LOC</sub> PP2 <sub>DIR</sub>
V PP1 <sub>DIR</sub>	*V PP2 <sub>LOC</sub>
	*V PP2 <sub>DIR</sub>
	V PP1 <sub>DIR</sub> PP2 <sub>LOC</sub>
	*V PP1 <sub>DIR</sub> PP2 <sub>DIR</sub>

The interpretive patterns shown by *do-so* insertion suggest that the located motion interpretation of locative PPs arises when the PP is adjoined to a projection of Voice.

Both fronting and *do so* replacement show that a higher attachment site results in an unambiguous interpretation of located motion. The facts of *do so* replacement in particular provide evidence that the lowest possible attachment site for the locative interpretation of PPs is VoiceP. This claim is also bolstered by similar evidence described by Tungseth (2005) for Norwegian.

- (22) Jamie ran behind the house (located motion)



#### 4.1.2 Semantics

Before attempting to discuss the formal semantics and compositionality of located-motion PPs, I will first attempt to describe informally, with as much precision as possible, how they are interpreted. Consider the intransitive and transitive sentences in (23) in their located-motion interpretation.

- (23) a. Tim danced under the awning.  
b. Kate and Gwen threw the ball behind the house.

The locative PP serves to describe the location of something but what exactly? In (23-a) Tim must be under the awning, and in (23-b), Kate and Gwen, and the ball must be behind the house. The PP does not, however, directly locate these entities; rather, it locates them

by virtue of their participation in the events described by the sentences. It is the events, participants and all, that the PPs locate.

Zwarts and Winter (2000), in their discussion of the semantics of locative PPs, provide a mechanism that can be modified to give us the results we need. The antilocation predicate ( $loc^-$ ), which is responsible for introducing the figure argument, is a function from places to properties of entities (type  $\langle l, et \rangle$ ). It is encoded in little-p which Svenonius (2003) proposes as the prepositional analogue to Voice in the verbal domain.

$$(24) \quad loc^- \stackrel{def}{=} \lambda w_l. \lambda x_e. [loc(x) \subseteq w]^4$$

It asserts that the location of the figure,  $x$ , is contained in the place,  $w$ , as defined by the locative PP. For example, to assert that a ball is inside a box is to assert that every point in space that the ball occupies coincides with the endpoint of a vector that is a member of the set of vectors that *inside the box* defines. If we generalize the antilocation predicate to events as well as entities, we can combine the PP with the verbal domain directly.

$$(25) \quad loc_{events}^- \stackrel{def}{=} \lambda w_l. \lambda e_s. [loc(e) \subseteq w]$$

This version of the antilocation predicate takes a location,  $w$ , and an eventuality,  $e$ , and asserts that the location of  $e$  as a whole is described by  $w$ . Note that once the first argument of the predicate is saturated by the location, as encoded by the locative preposition and its complement, the resulting object is a property of eventualities (type  $\langle s, t \rangle$ ), which is the same type as VoiceP which the PP adjoins to. The PP and the VoiceP can combine by Predicate Modification and return another property of eventualities, as demonstrated in (27) below.

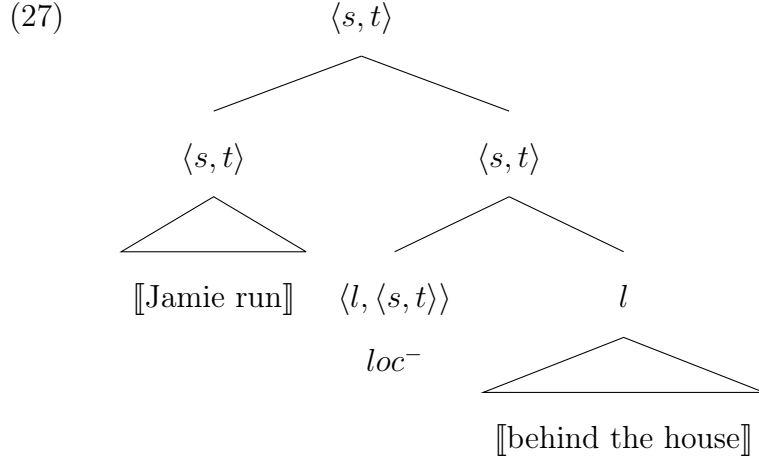
(26) **Predicate Modification (generalized to eventualities)**

If  $\alpha$  is a branching node that has two daughters,  $\beta$  and  $\gamma$ , and if both  $\llbracket \beta \rrbracket$  and  $\llbracket \gamma \rrbracket$  are of type  $\langle s, t \rangle$  then  $\llbracket \alpha \rrbracket = \lambda e_s. [\llbracket \beta \rrbracket(e) \wedge \llbracket \gamma \rrbracket(e)]$

(adapted from Heim and Kratzer, 1998)

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<sup>4</sup>As noted in fn 3, formal descriptions of spatial semantics are discussed at a fairly high level of abstraction.



The denotation of VoiceP for the located motion reading of *Tim danced under the awning*, is demonstrated below.

$$(28) \quad \exists e_s [\text{DANCE}(e) \wedge \text{AGENT}(e)(\text{Tim}) \wedge \text{loc}(e) \subseteq \text{under\_the\_awning}]$$

The fact that adjoining a locative PP to a projection of Voice gives rise to the a located motion interpretation, then, can be explained by minimally modifying already existing semantic machinery.

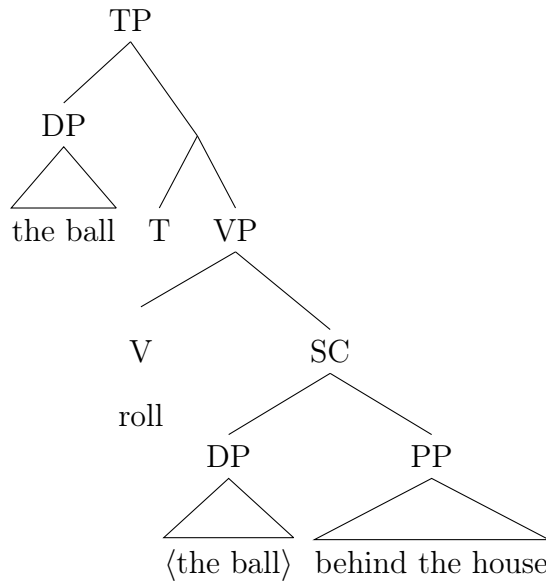
## 4.2 Directionalized Locatives as Resultatives

### 4.2.1 Syntax

There is fairly wide consensus that motion verbs with directional PPs have an unaccusative structure (Hoekstra and Mulder, 1990; Collins, 1996; Grewendorf, 1989), meaning the subject originates within the projection of the lexical verb rather than Voice. Under the account of directionalized locatives that I will propose, their apparent directional interpretation can be derived from the fact that the clauses that they occur in have the same structures as those with motion verbs and directional PPs. Within this unaccusative analysis of motion verbs, however, there are two possible ways to analyse the precise structure of these constructions, which I will refer to as a the Small Clause analysis and a Complex Predicate analysis. According to the Small Clause analysis, the Figure/Theme argu-

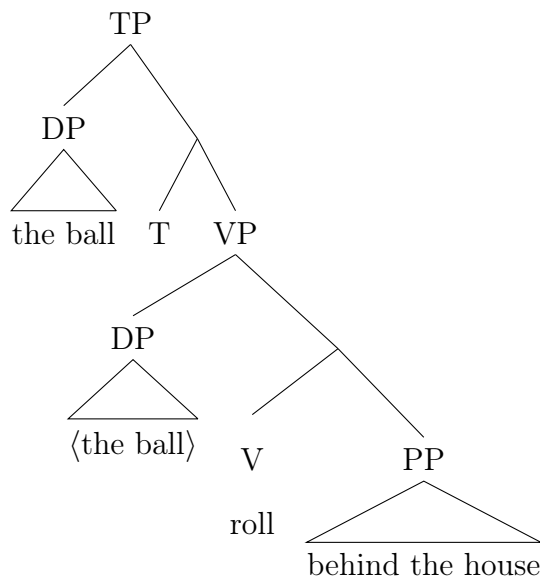
ment and the PP form a constituent that merges with the lexical verb. In an intransitive sentence (*e.g.*, *The ball rolled behind the house*), the subject originates in a small clause that constitutes the complement of the lexical verb and raises to subject position in TP.

(29) **Small Clause analysis**



In the Complex Predicate analysis, the PP merges with the lexical verb, forming a complex predicate which then merges with the Theme/Figure argument. In *The ball rolled behind the house*, the subject originates in the specifier of VP and moves to subject position.

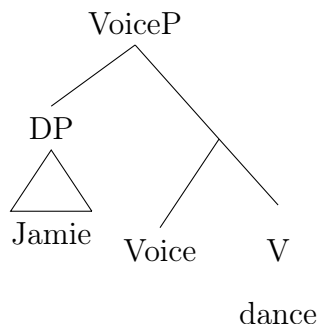
(30) **Complex Predicate analysis**



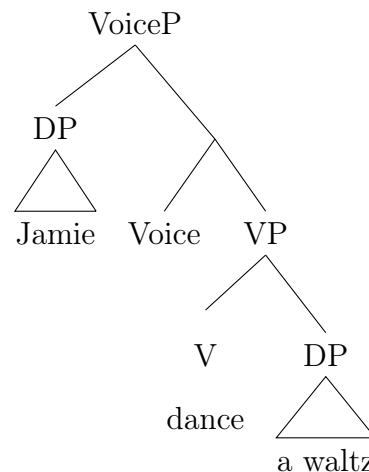
To compare these two analyses, let's consider the unergative verb *dance*. Unergatives, in

their intransitive forms, do not project an internal argument, but can be optionally transitive. When they are transitive, their internal arguments are generally some sort of cognate object.

(31) a. *Jamie danced*



b. *Jamie danced a waltz*



Cognate objects of unergatives cannot co-occur with directional PPs and retain their interpretation as cognate objects, as shown in (32)

(32) \**Jamie and Leslie danced a waltz into the room.*

There are, however, two interpretations that render strings like (32) grammatical. The first acceptable parse of (32) is one in which the directional PP modifies the object as demonstrated below, in (33).

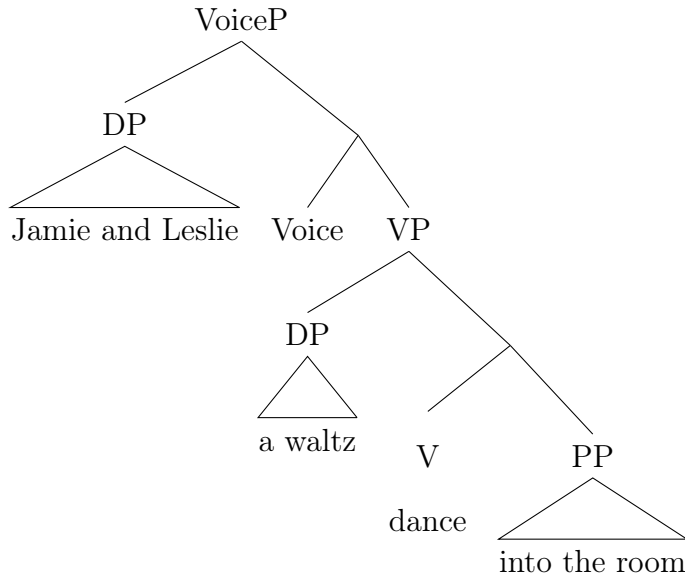
(33) *Jamie and Leslie danced* [<sub>DP</sub> *a waltz* [<sub>PP</sub> *into the room*]].

In this case, *a waltz into the room* is a constituent and the resulting structure is identical to (31-b), but with a larger cognate object. The second acceptable interpretation of (32) is one in which *a waltz* is an entity being brought into the room by Jamie and Leslie's dancing. This interpretation, which I refer to as the causative interpretation, will be discussed later.

Under the Complex Predicate analysis, there is no obvious reason why (32) is ungrammatical with the intended interpretation. All of the nominals are able to be Case-licensed (*Jamie and Leslie*: in spec-TP, *the room*: by P, *a waltz*: by Voice), and they all receive

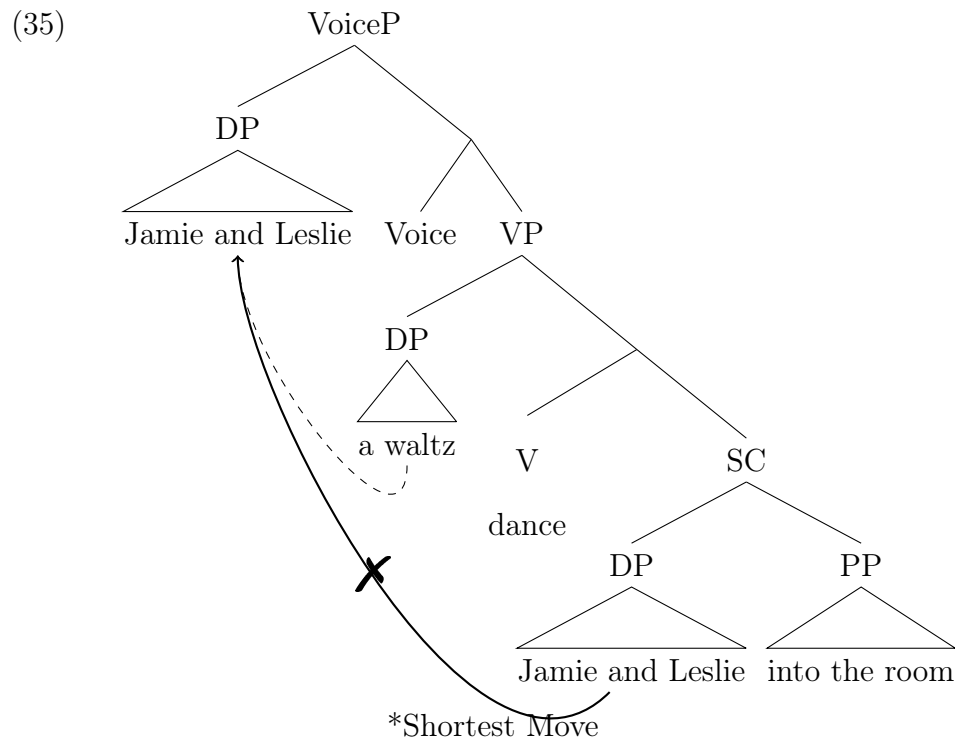
$\Theta$ -roles (*Jamie and Leslie*: Agent, *the room*: Goal, *a waltz*: Theme). As can be seen by the structure in (34), the Complex Predicate analysis predicts that (32) can be derived and, therefore, should be grammatical.

(34) \**Jamie and Leslie danced a waltz into the room*



If we assume a Small Clause analysis for the structure of (32), we can see that it is ruled out by locality. According to this analysis, the DP that is interpreted as the entity that moves (*i.e.*, the figure) originates in a small clause with the directional PP below the lexical verb. In the case of (32), *Jamie and Leslie* are interpreted as moving, while the cognate object, *a waltz*, is not interpreted as an entity in motion. The figure, *Jamie and Leslie*, being the subject of the clause, must raise through Spec-Voice to Spec-T. As demonstrated below in (35), moving the figure from the small clause to Spec-Voice violates *Shortest Move* because the cognate object is structurally closer to Voice than the figure.

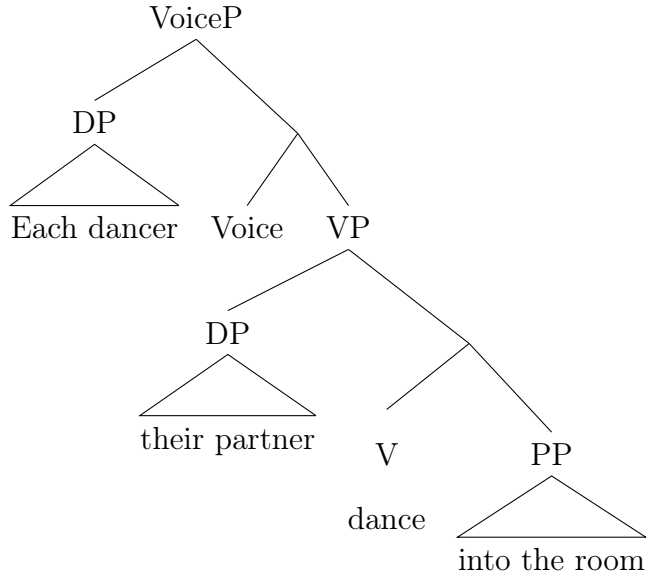




The Small Clause analysis of directional PPs, then, explains why cognate objects and directional PPs cannot co-occur in unergative VPs with nothing more than standard assumptions of locality. Were the verb and PP to form a complex predicate, however, there would be no reason to predict the ungrammaticality of (32).

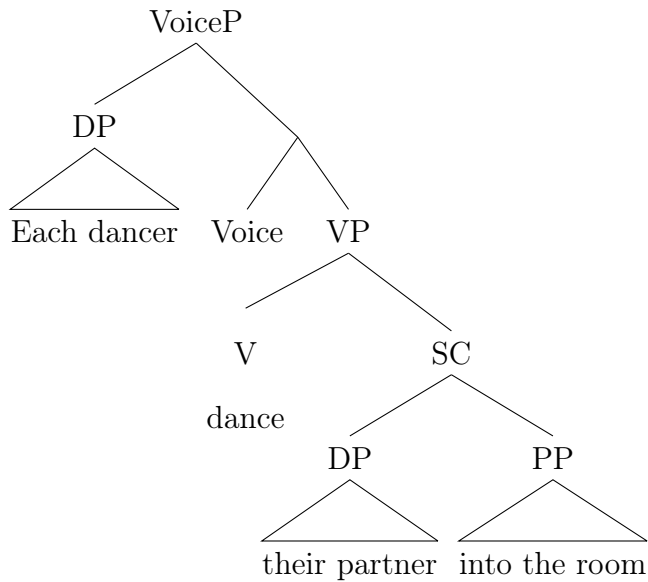
This contrast is made clearer when the causative interpretation is considered. Recall that the interpretation of (32) as a causative (compare *Each dancer danced their partner into the room.*) renders the string grammatical. The Complex Predicate analysis assigns a structure to the causative interpretation, as shown in (36), that is virtually identical to the structure of the ungrammatical interpretation

(36) *Each dancer danced their partner into the room.* (compare (34))



The Small Clause analysis gives structure for the grammatical parse of (32) (the one leading to the causative interpretation), that is different from the ungrammatical parse.

(37) *Each dancer danced their partner into the room.* (compare (35))



#### 4.2.2 Semantics

To begin, we must first describe the meanings of directionalized locatives. Consider the directionalized readings of the sentences below (reproduced from (2) above)

(38) a. Anna ran between the pylons.

- b. Jakub walked behind the shed.
- c. Berit swerved in front of cyclists.
- d. Rick ran under the awning.

The directionalized reading of these sentences, express that an entity moves in a certain manner to a specified location. For instance, the sentence in (38-d) asserts that Rick moved in a running manner such that he ended under the awning.

There are two types of semantic machinery that can be pressed into service to analyse the basic interpretive facts of directionalized locatives: paths and resultatives.

A path is “... a directed stretch of space, typically the trajectory or orbit along which an object moves.” (Zwarts, 2005). It is distinct from a place which lacks direction, although if we adopt the path algebra of Zwarts (2005) we can consider places to be atomic paths, that is paths with no proper subpaths. To determine whether directionalized locatives ought to be analysed as paths, I will compare their behaviour to that of unambiguously path-denoting objects: PPs headed by *to* and *through*. In particular, I will look at how their interpretation is affected by modification by *halfway*, which modifies path-denoting predicates and imposes path-like interpretations on non-path-denoting predicates (Bochnak, 2013). Consider the sentences below.

- (39)
- a. Irene jogged halfway to the CN Tower.
  - b. Doug drove halfway through Scarborough.

If (39-a) is true, Irene ends up at a place equidistant from her starting point and her goal (the CN Tower), while if (39-b) is true, Doug ends up in Scarborough with as much of the borough ahead of him as there is behind him. The interpretation of *halfway*-modified directional PPs lends weight to the suggestion that paths are divisible into subpaths. If the proper treatment of directionalized locatives is as paths we should expect to see similar interpretation patterns emerge from *halfway*-modification

- (40) Starting from the garage ...

- a. Anna ran halfway between the pylons.
- b. Jakub walked halfway behind the shed.
- c. Berit swerved halfway in front of cyclists.
- d. Rick ran halfway under the awning.

Modifying the locative PPs with *halfway* in these sentences is not as natural as doing so to directional PPs as in (39). The sentences do not mean that the person in question ends up in a place equidistant from their starting point and the location described by the locative PP. Rather, *halfway* seems to modify the locative relation. In (40-a) Anna ends up equidistant from each pylon, while in (40-b), Jakub ends up in a position such that half of his body is behind the shed. If a given directionalized locative  $\text{LOC}^{dir}$  were interpreted as *to* LOC or *through* LOC, we would expect the option of *halfway* modifying the directional element (*to* or *through*), instead *halfway*-modification targets the locative across the board.

The alternative to path semantics that I put forward is resultatives as described by Kratzer (2004). Some characteristic resultatives are given below in (41).

- (41)
- a. hammer the metal flat
  - b. paint the wall red
  - c. blow his hair dry

When resultatives are modified by *halfway*, the adjectives, as in the case of locative PPs, are coerced into path-denoting items.

- (42)
- a. ?hammer the metal halfway flat
  - b. ?paint the wall halfway red
  - c. ?blow his hair halfway dry

This similarity between *halfway* modification of directionalized locatives and resultative adjectives, suggests that the two are related. IN the remainder of this section, I will show how the two constructions are related.

As analysed by Kratzer, these resultatives involve two eventualities, one event and one state. For instance, (41-a) involves a hammering event and a state of being flat. These two eventualities represent a resultative due to the relationship they have with each other. First, the state of being flat is the a subpart of the hammering event, and second, the state of being flat is causally implicated by the hammering event. Kratzer represents this relationship with the two-place predicate CAUSE. The logical form of the resultative *hammer the metal flat*, then, is given below in (43).

$$(43) \quad \llbracket \text{hammer the metal flat} \rrbracket = \\ \lambda e_s \exists s_s [\text{EVENT}(e) \wedge \text{HAMMER}(e) \wedge \text{STATE}(s) \wedge \text{FLAT}(\text{the metal})(s) \wedge \text{CAUSE}(s)(e)]$$

Note that, according to this analysis, eventualities cause eventualities. This differs from traditional conceptions of causation which assumes that entities cause eventualities. There is no *causer* in Kratzer's analysis.

Given the generally assumed commensurability of eventualities with paths and places, it is reasonable to suggest that spatial PPs can be interpreted as result states. So, if the SC with a locative PP is construed as a predicate of eventualities, the directionalized locatives can be given a similar interpretation to adjectival resultatives.

$$(44) \quad \llbracket \text{Doug run behind the house} \rrbracket = \\ \lambda e_s \exists s_s [\text{EVENT}(e) \wedge \text{RUN}(e) \wedge \text{STATE}(s) \wedge \text{behind\_the\_house}(\text{Doug})(s) \wedge \text{CAUSE}(s)(e)]$$

There does seem to be one stumbling block for a resultative analysis of directionalized locatives, and that is the fact that directionalized locatives receive either a goal-like interpretation or a route-like interpretation. In canonical resultatives, such as those in (41), the action described by the verb proceed up to the point at which the result state obtains which signals the end of the event. If we consider locative PPs as stative predicates, then the goal-like interpretation of directionalized locatives fit nicely with canonical resultatives. For example, to say *Doug ran behind the house* means that there was a running event which proceeded up to the point at which Doug is behind the house. In a route-like interpretation

of this sentence, the running event continues such that Doug is no longer behind the house. A closer look at the fact that the result state seems to be the endpoint of the event, shows that it may arise from an implicature rather than the truth conditions of the resultative.

Consider the resultative *paint the wall blue*. It describes two eventualities, a painting event and the state of the wall being blue, and a causal relation between the two. The phrase can be rephrased as *apply paint such that the wall is blue*, but not as *apply blue paint to the wall*. In practice, however, painting a wall blue is almost always achieved by applying blue paint to the wall. This practical inference is drawn from world knowledge, though.

Consider the following situation. Recent advances in paint technology have culminated in the invention of translucent paint. Rather than completely obscuring the previous colour and design, translucent paint merely tints the surface. Mary starts painting a yellow wall with translucent blue paint. After two coats of paint, the wall is green. At this point the utterance in (45) would be true.

(45) Mary painted the wall green.

Suppose Mary were to continue applying coats of paint until the wall is blue, at which point the utterance in (46) would be true.

(46) Mary painted the wall blue.

Also at this point, though it would be pragmatically odd to utter, (45) would still be a true statement. Putting (45) in the past perfect as shown below in (47) would make it more felicitous.

(47) Mary had painted the wall green.

I take the past perfect in English to assert that the event described by VoiceP was completed (perfect aspect) by some reference time that precedes the utterance time (past tense) (McGilvray, 1991, pp 16-19). Since the result state (the wall being green) is the maximal element of the causal chain represented by the event described, it follows that the state

should hold at the reference time defined by the tense of (47). If, in the situation under discussion, the two events (Mary painting the wall blue and Mary painting the wall green) have occurred, we must ask how they relate to one another. If we can say an event of Mary painting the wall green can be a subevent in the sense of Bach (1986) of an event of Mary painting the wall blue, then the result state of the former event is a transitory state.

If we consider the narrative under question slightly more formally, we can see that the painting green event can be considered part of a painting blue event. The event structure of the narrative is demonstrated below in (48), where  $s_0$ ,  $s_1$ , and  $s_2$  are the states of the wall being yellow, green, and blue, respectively, and  $e_0$ ,  $e_1$ , and  $e_2$  are painting events.

$$(48) \quad \underbrace{\overbrace{s_0 \rightarrow s_1}^{e_0} \rightarrow s_2}_{e_1} \\ \underbrace{\hspace{1.5cm}}_{e_3}$$

In the narrative,  $e_0$  represents the painting green event described in (45), and  $e_1$  represents the painting blue event described in (46). What, then, can we say about  $e_3$ ? It is a painting event whose end state is the wall being blue ( $s_2$ ). As such,  $e_2$  is a painting blue event which contains a painting green event.

In most cases, resultatives involve a transition between opposing states (*wet/dry*, *long/short*, *etc.*), making it difficult to imagine a result being transitory. If, after blowing their hair dry, a person were to continue, their hair would continue to be dry, or become even drier. As the narrative above demonstrates, certain resultatives can encode transitory result states, which suggests that it is the state-encoding predicate (*i.e.* the adjective) that allows or disallows interpreting the result state as transitory. Importantly, the relation between the event and the result state does not specify if the state is transitory or not. If certain canonical resultatives can describe transitory result states and directionalized locatives are a species of resultatives, it follows that the directionalized locatives can describe transitory (and final) states. Thus, the goal-route ambiguity in directionalized locatives arises from an underspecification in the result relation.

## 5 Predictions and implications

Given the analysis of directionalized locatives as resultatives argued for above, It is natural to ask whether the morphosyntactic properties of directionalized locatives bear any similarity to those of adjectival locatives. As Kratzer (2004) notes, adjectival resultatives, which are common to Germanic languages, are absent in Romance languages. It would follow, then, that directionalized locatives should be absent in Romance languages. If we consider Standard French as a representative example of Romance Languages, we see that, while locative PPs can be interpreted as goals of motion, they only receive this interpretation when combined with verbs that express directed motion (*e.g.*, *entrer* “enter”, *aller* “go”). When combined with manner of motion verbs (*e.g.*, *courir*, “run”), however, locative PPs receive only a located motion interpretation.

- (49) a. *Jean a couru entre les deux poteaux.*  
 John has run between the two posts  
 “John ran between the two posts” (locative, \*directional)
- b. *Jean a passé entre les deux poteaux.*  
 John has passed between the two posts  
 “John passed between the two posts”  
 (\*locative, directional)
- c. *Jean a passé entre les deux poteaux en courant.*  
 John has passed between the two posts in running  
 “John passed between the two posts running” (\*locative, directional)
- (50) a. *Marie a couru dans la salle.*  
 Mary has run in the room  
 “Mary ran in the room” (locative, \*directional)
- b. *Marie est entrée dans la salle.*  
 Mary is entered in the room  
 “Mary entered the room” (\*locative, directional)
- c. *Marie est entrée dans la salle en courant.*  
 Mary is entered in the room in running  
 “Mary entered the room running” (\*locative, directional)



So, if we compare French and English (as stand-ins for Germanic and Romance) with respect to adjectival resultatives and directionalized locatives we can see a clear split, with English allowing both constructions and French allowing neither.

(51)

	Adjectival	Directionalized
	Resultatives	Locatives
French	No	No
English	Yes	Yes

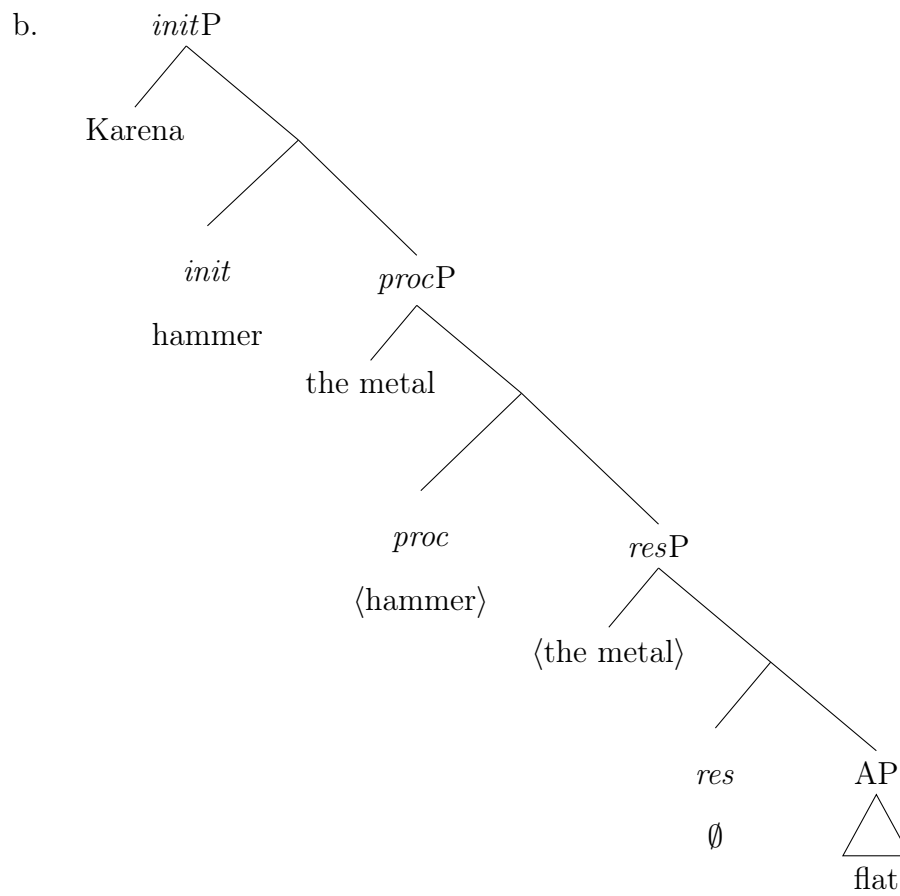
What causes this split though? Resultatives and directionalized locatives are phenomena related to argument structure, event structure and *aktionsart* so one would expect to find explanations of them in the body of syntactic literature that deals with argument structure, event structure and *aktionsart*. This body of literature (*e.g.*, Harley, 2005; Folli and Harley, 2006; Ramchand, 2008; Tungseth, 2008) presents precise hypotheses of how a given language packages semantic features in its lexical items and how the choices of packaging those features affect that language’s syntax. At first blush, though the hypotheses developed rarely address crosslinguistic variation, it seems trivial, given an analysis of a phenomenon in one language, to extend that analysis to demonstrate why a second language lacks that phenomenon. To show how this might work, consider one particular approach this question found in Ramchand (2008) and Tungseth (2008).

According to this approach, verbs are decomposed into at most three heads in a functional sequence: *init*(iation)  $\succ$  *proc*(ess)  $\succ$  *res*(ult). A given verb root bears a combination of the features that make up the functional sequence each of which must be identified with a functional projection in the syntax. Note that, though each feature must be associated with a projection, there is no requirement that each functional projection be associated with a feature on a verb. Consider the Ramchandian analyses of the constructions under discussion here.

(52) *Karena hammered the metal flat*

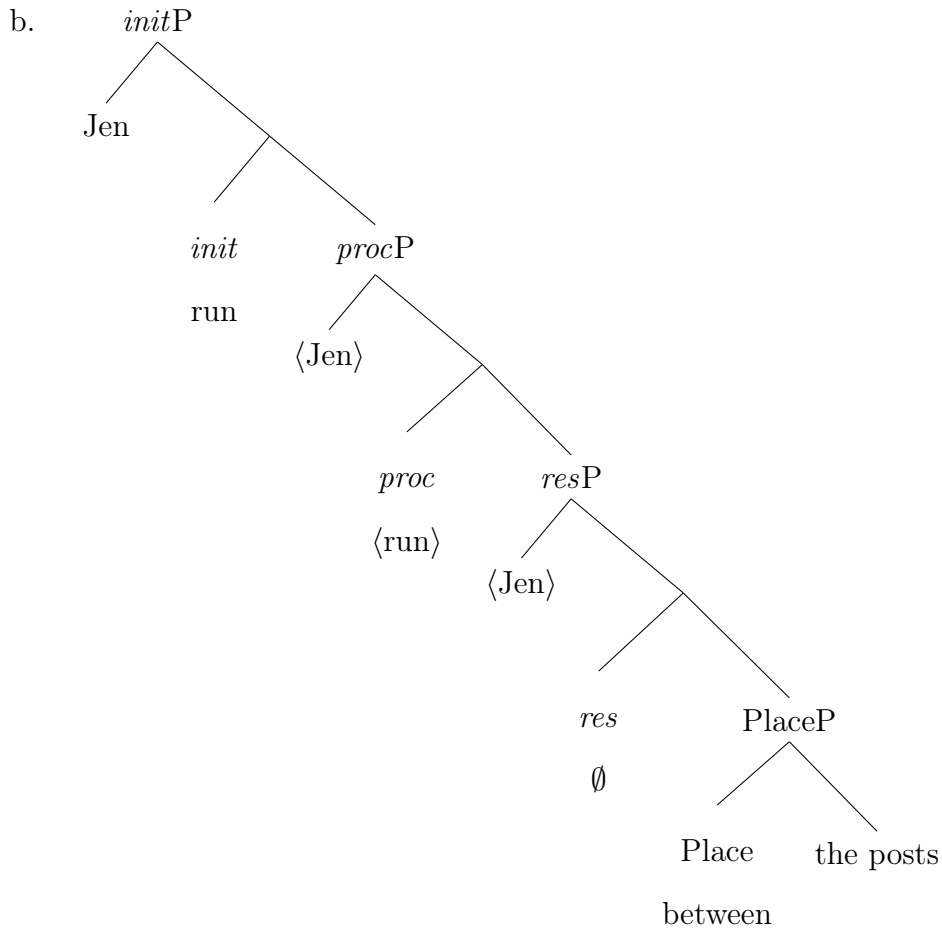
a. hammer[*init*, *proc*]

(Ramchand, 2008)



(53) *Jen ran between the posts*

a.  $\text{run}[\text{init}, \text{proc}]$



The verbs that participate in either adjectival resultatives or directionalized locatives do not *per se* define results, so they are not lexically specified for result features. We would expect the corresponding verbs in French to have the same lexical specification, or at least encode a process and not a result. The difference between French and English, then, must lie in the *resP*. Suppose that French does not allow the unassociated *res* head required for these constructions. We would expect this gap to have other consequences elsewhere in the language. Kratzer (2004) argues that what would be called a *res* head in Ramchand's framework is responsible for result-encoding deadjectival verbs such as *flatten* and *reddden*. If French were to disallow the unassociated *res* head, we would not expect it to have result-encoding deadjectival verbs of this sort. On the contrary, French has exactly these type of derived verbs

(*a-plat-ir* “flatt-en”, *roug-ir* “redd-en”). If we cannot say that it is the lack of a *res* head that disallows resultative structures, perhaps it is the small clause, which I and Kratzer (2004), respectively, have argued is central to proper analyses of directionalized locatives and resultatives, that is disallowed in French. This hypothesis, however, cannot be maintained, as French does allow depictive constructions, which transparently involve a small clause

- (54) *J’ ai connu Marie heureuse.* (Depictive)  
 I have known Marie happy (Kratzer, 2004)

In fact, if the split under investigation were due to French and English differing in how they lexicalize a result feature, we would be no closer to answering the question posed at the beginning of the section. We will have merely described the phenomenon formally, rather than explaining it. Even if we are able to perfectly describe the lexicalization patterns of French and English, we are left with the question of how children are able to acquire those patterns. Since lexicalization patterns of the type discussed here are semantic in nature, the child has little or no direct evidence for them in the primary linguistic data. A proper explanation will derive the (un)acceptability of directionalized locatives and adjectival resultatives from other grammatical properties that are apparent on the surface.

In her analysis of adjectival resultatives Kratzer (2004) suggests that predicative adjectival agreement determines whether or not a language allows adjectival resultatives. In German (where attributive adjectives agree with the DP containing them), and in English predicative adjectives are uninflected and adjectival resultatives abound. French, on the other hand, requires predicative adjectives to agree with their subjects and disallows adjectival resultatives.

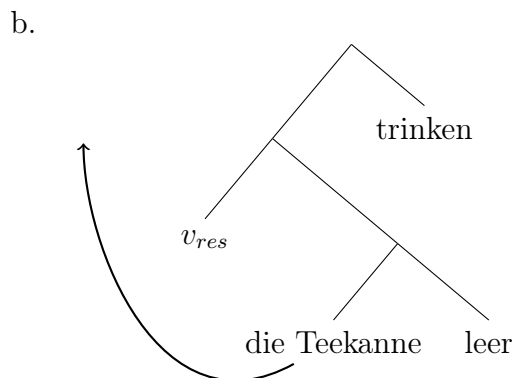
- (55) French
- a. *Elle est petit -e.*  
 3SgFem is small 3SgFem  
 “She is small”
  - b. \**Elle est petit.*  
 3SgFem is small

(56) German

- a. \**Sie*      *ist klein* *-e*.  
       3SgFem is   small 3SgFem
- b. *Sie*      *ist klein*.  
       3SgFem is   small  
       “She is small”

Kratzer attempts to derive the lack of resultatives from predicative adjectival agreement by arguing that resultative semantics from a derivationalal null morpheme which cannot be affixed outside inflection. Under her analysis of adjectival resultatives, which I have adapted for my analysis of directionalized locatives, the object and the result adjective merge to form a small clause which merges with the result head. The object then raises past the result head which attaches to the adjective as a null affix.

- (57) a. *die Teekanne leer*    *trinken*  
       the teapot    empty drink  
       “drink the teapot empty.”



Kratzer proposes that, since  $v_{res}$  spells out as a derivational affix, it must attach to a stem. In German and English,  $v_{res}$  attaches to the bare adjective, but in languages whose adjectives show obligatory agreement,  $v_{res}$  is blocked from being attached to an inflected root.

This morphological account is problematic on two fronts. First, it rests on a distinction between derivational and inflectional morphology, a distinction with a dubious status in current theories of morphosyntax, and on constraints on their combination, but offers no

formulation how those constraints might be instantiated in the grammar. Second, it cannot readily be used to account for Norwegian and Icelandic, which have adjectival resultatives and predicative adjective agreement (Whelpton, 2007).

- (58) a. *Vi vaska golvet rein -t*  
 We washed the floor clean -NT  
 “We washed the floor clean” (Norwegian, Kratzer, 2004)
- b. *Hann málaði bílinn hans rauðan.*  
 He painted the.car.M.SG.ACC his red.M.SG.ACC  
 “He painted his car red.” (Icelandic, Whelpton, 2007)

These concerns, though quite problematic for Kratzer’s morphological account, do not require us to ignore the central insight that Kratzer bases her account on: that the acceptability of bare adjectives in a language is linked to the presence of adjectival resultatives. In this section, I will present a possible account of the presence/absence of resultatives and directionalized locatives that can be formulated in a current theory of grammar: Chomsky’s (2013; 2014), label theory. Before giving my account, I must first outline the relevant tenets of Chomsky’s label-theoretic syntax.

## 5.1 Label-theoretic syntax (Chomsky, 2013, 2014)

Chomsky’s label theory is based on two basic principles: First, that syntactic objects must be labeled to be properly interpreted, and second, that, for a given syntactic object  $\{\alpha, \beta\}$ , there is no *a priori* reason to know whether  $\alpha$  or  $\beta$  is the label; rather, the label is determined algorithmically. The label of a given syntactic object will be the most prominent member. In the case of  $\{X, YP\}$ , where  $X$  is a head, and  $YP$  is not, the label will be the head  $X$ . In the cases of  $\{X, Y\}$ , where both members are heads, and  $\{XP, YP\}$ , where neither member is a head, there is no single most prominent element, so choosing a label is not a simple task.

Since the  $\{X, Y\}$  cases are not relevant to this paper, I will set them aside and focus on the  $\{XP, YP\}$  cases. Chomsky suggests two ways of labelling  $\{XP, YP\}$ : If  $XP$  and  $YP$  agree in some feature  $F$ , then  $\{XP, YP\}$  will receive the label  $\langle F, F \rangle$ , or if there is

no agreeing feature  $F$ , then one of the members will be remerged higher. Following Moro (2000), Chomsky proposes that if a constituent is remerged in a higher position, its lower copy will be invisible to the labelling algorithm. Since  $\{XP, YP\}$  objects are by their nature symmetric, there is not general rule for which of their constituents will raise.

## 5.2 A label-theoretic account of resultatives and directionalized locatives

This analysis rests on two reasonable assumptions about language acquisition in the form of hypotheses made by the language learner.

(59) **Hypothesis A**

Absent evidence to the contrary, assume  $\varphi$ -features on all adjectives.

(60) **Hypothesis B**

Absent evidence to the contrary, PPs and APs pattern together.

Since Standard French adjectives show agreement in all positions, there is no reason for the learner of French to stray from Hypothesis A. In English and German, however, since bare adjectives are used (in predicate position and in compounds for German, and everywhere in English) the learner must weaken Hypothesis A. Even Norwegian and Icelandic learners must weaken Hypothesis A, as bare adjectives are allowed in certain contexts. In particular, both languages allow bare adjectives in compounds.

- (61) a. *Vi vaska rein (-t) golvet*  
 we washed clean -NT the floor  
 “we washed the floor clean”

- b. *Golvet er rein-vaska*  
 the floor is clean-washed  
 “The floor is washed clean.”

(Norwegian, Kratzer, 2004)

- (62) a. *svart-litaður*

black-coloured.M.NOM.SG

b. *þunn-sneiddu*


thin-cut.M.NOM.PL

(Icelandic, Whelpton, 2007)

For now I will stipulate that, in French, English, and German there is no evidence to stray from Hypothesis B. I will discuss a language which seems to stray from Hypothesis B below.

Recall that the basis of the constructions under discussion is a small clause, which, abstracting away from the category of the predicate (AP, PP, PredP, etc.), has the form {DP, XP}. This object must be labeled to be interpreted at the interfaces, following Chomsky (2013). Being a set of two non-heads, the small clause can receive a label in one of two ways. If the two members of the small clause share a feature F, they receive the label  $\langle F, F \rangle$ . Failing that, one member will move, rendering its lower copy unavailable to the labeling algorithm, and thus obviating the labeling problem.

Consider the derivation of an English directionalized locative: *Jamie kicked the ball between the posts*.

(63) [ Voice [ <sub>$\delta$</sub>  [the ball] [ <sub>$\gamma$</sub>  kick [ <sub>$\beta$</sub>  *v<sub>res</sub>* [ <sub>$\alpha$</sub>  [The ball] <sub>$\varphi$</sub>  [between the posts]]]]]]  


In its base generated form, the small clause  $\alpha$  cannot be labelled. Only one of its members (the DP) has  $\varphi$ -features, so it cannot be labelled  $\langle \varphi, \varphi \rangle$ . The DP, then must raise to allow  $\alpha$  to be labelled. Note that, though I used a sentence with a transitive verb *kick* to demonstrate the derivation of a VoiceP, an intransitive motion verb, such as *run*, would have an identical derivation up to the point of merging Voice.

In French we have a different situation, where APs and PPs bear  $\varphi$ -features. Both members of a small clause, then, bear  $\varphi$ -features and as such the small clause gets the label  $\langle \varphi, \varphi \rangle$ , leaving no motivation for the DP to raise.





The unacceptability of extraction, however, cannot be evidence for a learner of the phasal nature of and  $\varphi$ -features inherent to P, as grammaticality judgements are absent in the data available to the learner. Hypothesis B however, ensures that phasality and  $\varphi$ -features are the learner’s null hypothesis for P.

What kind of a language do we get when Hypothesis A holds but Hypothesis B is weakened? We would expect a language with directionalized locatives but without adjectival resultatives. PEI French is such a language, according to Ruth King and Yves Roberge (p.c. cited in Rooryck, 1996, pp 253–254). Sentences such as (67), which are exclusively locative in Standard French, can be interpreted as directional in PEI French, yet PEI French lacks adjectival resultatives.

(67) *La bouteille flottait [sous le pont].*

The bottle floated under the bridge (Rooryck, 1996)

It is no surprise that PEI French differs from Standard French in this way given the fact that that it also allows P-stranding as shown in the sentences in (68) below.

(68) a. *Le ciment a été marché dedans.*

the cement has been walked in

“The cement was walked in”

b. *Où il vient de?*

where he comes from

“Where does he come from?”

(Roberge and Rosen, 2013)

P-Stranding being apparent from word order, it likely can be used by the learner as evidence for weakening Hypothesis B and opening the door for directionalized locatives.

## 5.4 Summary

In this section I have reviewed the approach to crosslinguistic variation based of lexical decomposition. I argued that, though a given variant of the lexical decomposition approach may accurately and precisely describe the the structures underlying differing language, lex-

ical decomposition cannot explain how differences between language arise. I then reviewed Kratzer’s (2004) account of the presence or absence of adjectival resultatives, which are structurally similar to directionalized locatives. Though Kratzer’s particular account is quite difficult to formulate in current theories of morphosyntax, I proposed a different account that shares her insight that resultatives are linked to absence of agreement on predicative adjectives.

## 6 Further Questions

### 6.1 Norwegian and Icelandic

Since Norwegian and Icelandic resultative adjectives show agreement with the resultee, it would seem that they bear  $\varphi$ -features in that configuration. If adjectives have  $\varphi$ -features in result small-clauses, then that small clause can be labelled  $\langle \varphi, \varphi \rangle$  and the DP will not raise. On its face, this seems problematic to my account, and as such, it merits a much closer investigation.

### 6.2 Similarities with raising-to-object

One prominent account of exceptional case marking (ECM) in English of the sort demonstrated below in (69), is that subjects of infinitival clauses raise to the object position of the finite matrix verb (Postal, 1974; Chomsky, 2014).

(69) Joan believes him to be a genius.

Chomsky (2014) argues that the subject *him* raises past the matrix verb *believes* because roots cannot label phrases. The raised embedded subject provides a label for *believes* which then adjoins to Voice ( $v^*$  in Chomsky’s system).

(70) [Voice [him [ $\sqrt{\text{BELIEVE}}$  [ ... [him [ to be a genius ]]. ... ]]]

Note that the raising-to-object analysis of ECM as formulated by Chomsky (2014) and the analysis of directionalized locatives argued for here posit almost identical vacuous movements. They differ in their motivations, though. In the ECM analysis, The DP raises to satisfy labeling needs of a higher object (ROOT + embedded clause), while, in the analysis proposed here, the DP raises to render the small clause that it is evacuating from labelable.

Further work could be done to unify the two analyses and perhaps provide an explanation for the parameter that determines whether a language shows ECM.

### 6.3 Non-directionalizable locatives

There is a subset of locative Ps, that are not directionalizable. Consider *beside*, *below* and *above*.

- (71)
- a. #Alice drove beside the mile marker
  - b. #Angelika ran below the umbrella to get out of the rain.
  - c. #The birds flew above the houses to their nests.

There is no immediate explanation for these prepositions' seeming inability to directionalize. In order to fully deal with these examples, we must first establish whether these prepositions are absolutely non-directionalizable. If they are directionalizable in the right context, then they can be explained under the account in this paper. If they are truly non-directionalizable, then a deeper investigation into their syntax and semantics is needed.

## 7 Conclusion

In this paper I have developed an analysis of that treats a locative/directional ambiguity as structural rather than lexical. I showed that, when a motion verb and locative PP is interpreted as located motion, it is due to the PP being adjoined to the VoiceP, while when the PP is interpreted as directional, it merges with the subject DP as a small clause. I

discussed how the different interpretations arise from the different structures: located motion PPs as event modifiers, and directionalized PPs as resultatives. Finally I described a possible account of both adjectival resultatives and directionalized locatives based on Chomsky's (2013; 2014) label-theoretic syntax, which explains why English has both constructions while French does not, and how a language learner could acquire that parameter.

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# Subjects of Adjuncts and Labeling

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Dog Days Workshop  
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## 1 Introduction

- ACC-ing clauses (ACs) are non-finite clauses with accusative subjects and progressive main verbs.
  - Often embedded in direct perception reports.
- (1)    a.    They saw her proving the theorem.  
       b.    She was seen proving the theorem.
- Subjects of ACs have a strange movement pattern.
    - Subjects of pseudo-relatives (PRs) seem to show the same pattern. (Cinque 1996)
  - The pattern can be partially accounted for by assuming two label-based theories:
    - Labels are assigned algorithmically as a requirement of the Conceptual-Intentional (CI) interface. (Chomsky 2013, 2015)
    - Adjunction structures do not receive labels (Chametzky 1996; Hornstein 2009)
  - These assumptions require a rethinking of the CI interface which can allow for a full account of the pattern

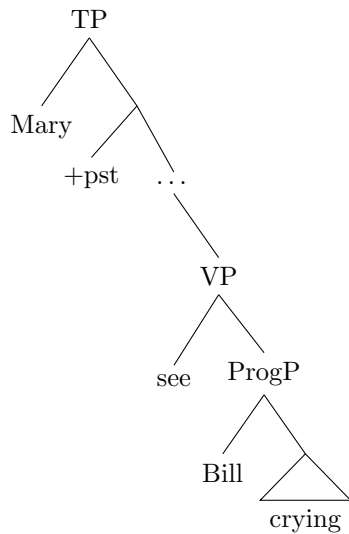
## 2 The phenomenon: ACC-ing (and Pseudo-relative?) subjects

- In active sentences, the perception verb doesn't  $\theta$ -mark the ACC-ing subject.
  - In passives, the perception verb does  $\theta$ -mark the ACC-ing subject
- (2)    a.    We heard it raining last night.  
       b.    We saw all hell breaking loose.  
       c.    We heard Jamie being slandered.
- (3)    a.    \*It was heard raining last night.  
       b.    \*All hell was seen breaking loose. (\*idiomatic)  
       c.    \*Jamie was heard being slandered.

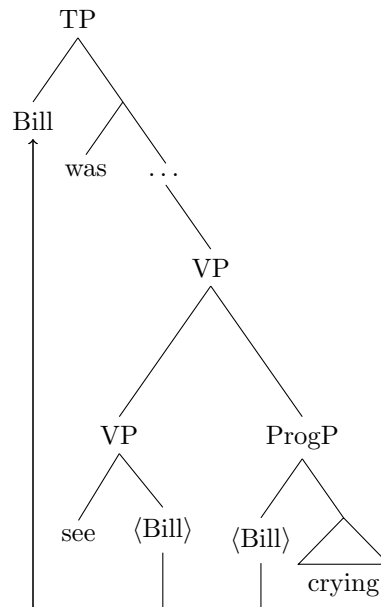


- THEME-marking occurs in Comp V.
- In actives, the AC occupies Comp V.
- In passives, the AC subject occupies Comp V.
  - The AC is adjoined to VP.

(4) **Active/Argument ACC-ing**

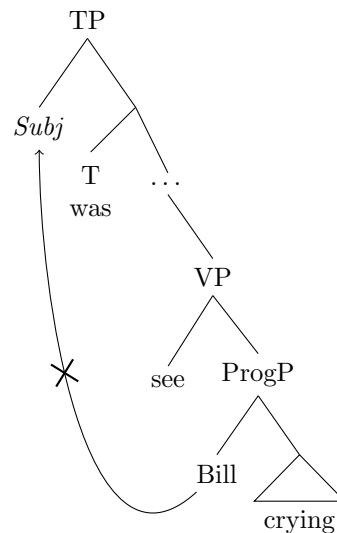
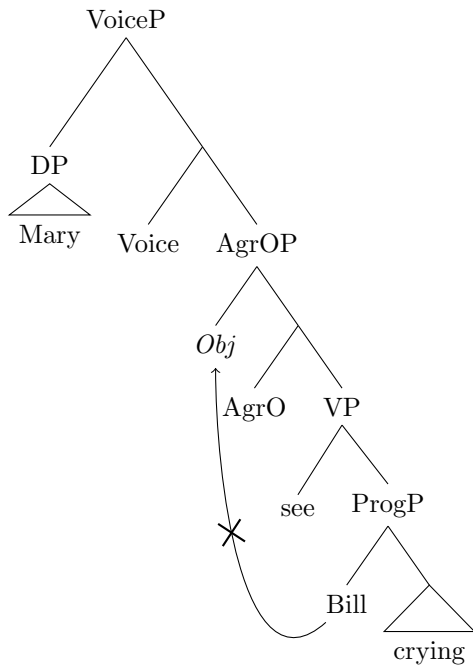


(5) **Passive/Adjunct ACC-ing**

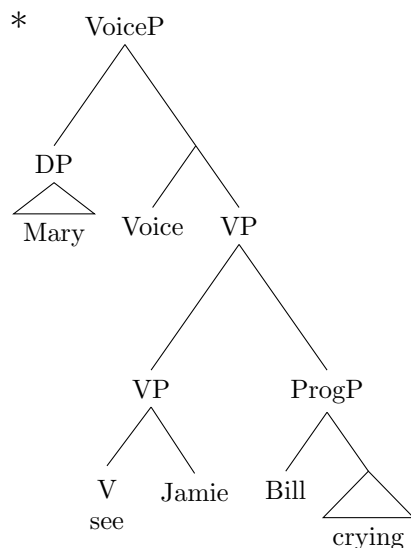


- Strange result: **The ACC-ing subject is frozen in the Argument ACC-ing, but must move from the Adjunct ACC-ing.**
- cp. Raising-to-Object and Adjunct Islands

(6) **Argument AC subjects do not move**



(7) **Adjunct AC subjects must move**



### 3 Label theory (Chomsky 2013, 2015)

#### 3.1 The Theory

- The narrow syntax is (simplest) Merge
  - $\text{Merge}(\alpha, \beta) = \{\alpha, \beta\}$
- Since Merge doesn't specify the label of its output, and the narrow syntax is only Merge, labels must be determined at one of the interfaces.
- Specifically: The CI interface.
  - Chomsky's CI primacy conclusion
- Labels are assigned by a special instance of Minimal Search, the Labelling Algorithm (LA), upon Transfer at the phase level.
- Unlabellable objects cause a crash.

But:

- No current theory of semantics has any need for labels.
  - For type-driven interpretation, only the content of syntactic objects is required
  - For a neo-Davidsonian theory, only the merge order of arguments is required
- If our current understanding of the syntax-semantics interface is correct, the proposal above must be wrong.
- **$\therefore$  If the proposal above is correct, our current understanding of the syntax semantics interface is wrong.**

### 3.2 Labelling algorithm

- LA, when applied to a syntactic object SO, searches SO for its most prominent sub-object and assigns that as SO's label.
- Chomsky (2013) discusses the three logical possibilities:

- (8)
- $LA(\{X, YP\}) = X$
  - $LA(\{X, Y\}) = \begin{cases} X & \text{if } Y \text{ is a root, and } X \text{ is not a root} \\ \text{Undefined} & \text{otherwise} \end{cases}$
  - $LA(\{XP, YP\}) = \begin{cases} \langle F, F \rangle & \text{if } XP \text{ and } YP \text{ agree for some feature } F \\ LA(YP) & \text{if } XP \text{ is a lower copy in a chain} \\ \text{Undefined} & \text{otherwise} \end{cases}$

## 4 Labelling explanation

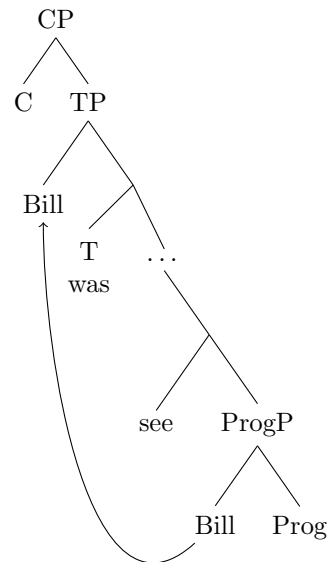
- |                         |                         |
|-------------------------|-------------------------|
| (9) <b>Argument ACs</b> | (10) <b>Adjunct ACs</b> |
| a. $\{DP, ProgP\}$      | a. $*\{DP, ProgP\}$     |
| b. $*\{t, ProgP\}$      | b. $\{t, ProgP\}$       |

### 4.1 Argument ACC-ing subjects cannot move

- Subject of argument ACs show **Criterial freezing** (in Rizzi's terms).
- Chomsky (2015) proposes a labelling account for this type of freezing.
  - $\{XP_F, \{Y_F, ZP\}\}$  is labelled  $\langle F, F \rangle$ .
  - Y is “too weak” to label on its own.
  - $\{t, \{Y_F, ZP\}\}$  is unlabellable so it yields a crash.
- Replace XP with the AC subject and Y with  $Prog^0$  and we have our account.

- (11)
- $*Bill_i$  was see-en [  $t_{see}$  [  $t_i$  throwing the ball]]
  - Derivation**

1. Merge(Bill,  $\{Prog, YP\}$ )
2. Transfer+Label( $YP$ )<sup>1</sup>
3. Merge(see, ProgP)
- ...
- (Derive the finite clause)
- ...
4. (Internal-)Merge(Bill, T')
5. Merge(C, TP)
6. Transfer+Label(TP)
- \*CRASH\*
- ( $\{t, Prog\}$  is unlabellable.)



<sup>1</sup>Assuming  $Prog^0$  is a phase head, following Harwood (2015)

## 4.2 Adjunct ACC-ing subjects can move

- **Assumption:** Adjunction structures do not receive a label. (Chametzky 1996; Hornstein 2009)
  - If  $\{XP, YP\}$  is an adjunction structure, LA skips it, and moves on to the adjunction host.
- The AC is an adjunct and thus, invisible the labelling algorithm.
- It follows that the internal structure of the AC is also invisible to LA.
- $\{t, \text{Prog}\}$  is still unlabellable, but doesn't lead to a crash.
  - Crashes occur when LA fails

## 4.3 Adjunct ACC-ing subjects *must* move.

- If labelling is required at the CI interface, it must have some semantic potency.
- So  $\{XP, YP\}$  will be interpreted differently depending on its label
  - Criterial:  $\text{Label}(\{XP, YP\}) = \langle F, F \rangle \rightarrow \text{Abstraction}$ 
    - \* Including, but not limited to, lambda abstraction (cp Lohndal and Pietroski 2011)
  - Adjunct:  $\text{Label}(\{XP, YP\}) = \emptyset \rightarrow \text{Conjunction}$
- An unlabelled  $\{DP, \{\text{Prog}, YP\}\}$  is interpreted as the conjunction of a ProgP predicate and its subject.
  - This is (likely) a deviant interpretation
- An unlabelled  $\{t, \{\text{Prog}, YP\}\}$ , however, does not yield a deviant interpretation.
  - This is stipulated for now.

## 5 “Conclusion”

- Chomsky proposes that for a derivation to converge at CI it must produce a labellable syntactic object.
- If Chomsky is right, we need to rethink our conception of the syntax-semantics interface.  
**My Proposal:** The label of a syntactic object has consequences for that object's interpretation.
- I have shown how a puzzling fact about ACC-ing subjects can be straightforwardly explained, given Chomsky's proposal (and my extension).
- Several aspects require more explanation/work:
  - How does the LA “know” to skip adjunction structures?
  - How are  $\{t, XP\}$  structures interpreted?
  - I predict that no adjunct phrases should have criterial specifiers.

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