Directionalized locatives
A label theoretic account

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February 4, 2015

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 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*[1]. These prepositions are all ambiguous between directionalized and

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[1]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.

located motion readings as demonstrated below.

(2) a. Anna ran between the pylons ...

   (i) on her way to the endzone.   (Directionalized)

   (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.

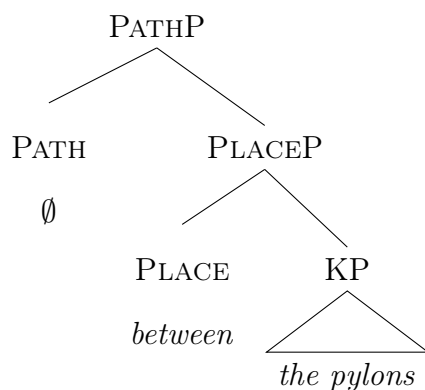### 3.1.1 The syntax of Spatial PPs (Svenonius, 2010)

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

(3)   a.   Locative PP

```
          PlaceP
         /      \
    Place        KP
   between      /  \
             the pylons
```
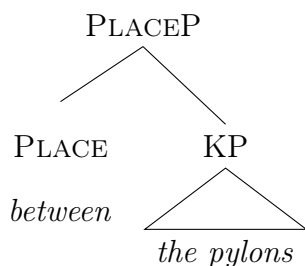
        b.   Directionalized PP

            (following Svenonius, 2010)

```
            PathP
           /     \
       Path       PlaceP
        ∅        /      \
             Place        KP
            between      /  \
                      the pylons
```

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[2]. 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) $[\![\text{V PP}]\!] = \{e \in [\![\text{V}]\!] : \text{SHAPE}(e) \in [\![\text{PP}]\!]\}$ (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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[2]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.
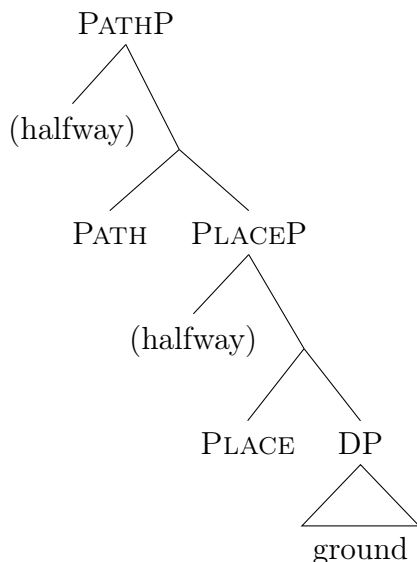
　　When adjoined to locative PPs, it is interpreted as modifying either the figure or place denoted by the PP, depending on the preposition.

(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))

```
            PATHP
           /\
    (halfway) \
             /\
          PATH  PLACEP
               /\
        (halfway) \
                 /\
              PLACE  DP
                    /\
                   /__\
                  ground
```

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[3]). 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 $[\![\text{PLACE}]\!]$ 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 ($[\![\text{PLACE}]\!] \in D_{\langle e,l \rangle}$) 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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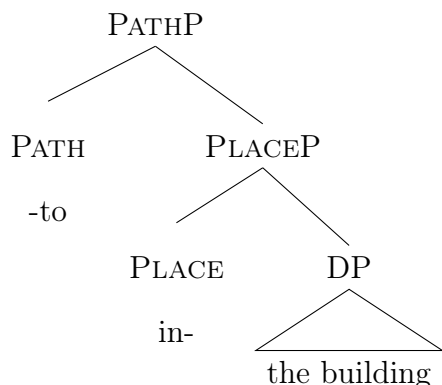
[3] The discussion herein of the spatial semantics argued for by Zwarts and Winter (2000) is for the sole purpose of exposing a predicted type mismatch. As such the semantic system is presented at a high level of abstraction, obscuring the details of the vector-space theory.
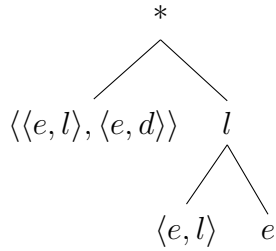
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If we make the standard assumption that there is a one-to-one mapping between the base-generated syntactic structure and semantic interpretation Svenonius' lexical items have denotations of the types given below.

(11)   The semantic inventory

      a. $[\![\textit{the building}]\!] \in D_e$

      b. $[\![\textsc{Place}]\!] \in D_{\langle e,l\rangle}$

      c. $[\![\textsc{Path}]\!] \in D_{\langle\langle e,l\rangle,\langle e,d\rangle\rangle}(= dir)$

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 $\textsc{Path}$ head (type $\langle\langle e,l\rangle,\langle e,d\rangle\rangle$) with the $\textsc{PlaceP}$ (type l). This type mismatch is demonstrated below.

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

$$
\begin{array}{c}
* \\
\diagup \diagdown \\
\langle\langle e,l\rangle,\langle e,d\rangle\rangle \quad l \\
\diagup \diagdown \\
\langle e,l\rangle \quad e
\end{array}
$$

The directional operator, as encoded by the $\textsc{Path}$ 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)
$$
\begin{array}{c}
d \\
\diagup \diagdown \\
\langle e,d\rangle \quad e \\
\diagup \diagdown \\
\langle\langle e,l\rangle,\langle e,d\rangle\rangle \quad \langle e,l\rangle
\end{array}
$$

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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)

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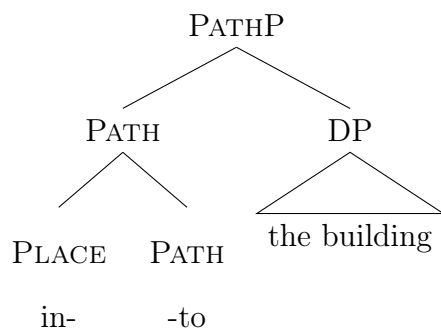
At first glance this modification seems to retain the basic claim of Svenonius' account of directionalized locative: that a PATH head is responsible for the directional interpretation of locatives. In the sentence *Jamie ran behind the screen*, then, *behind* would be ambiguous between a PLACE head and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

(15)   Jamie ran [behind the screen.]

    a.   Located Motion

```
           PlaceP
          /     \
      PLACE      DP
      behind     /  \
             the screen
```

    b.   Directionalized
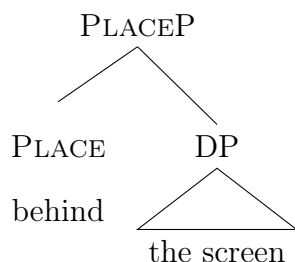
```
              PathP
             /     \
          PATH      DP
          /  \      /  \
     PLACE  PATH  the screen
     behind
```
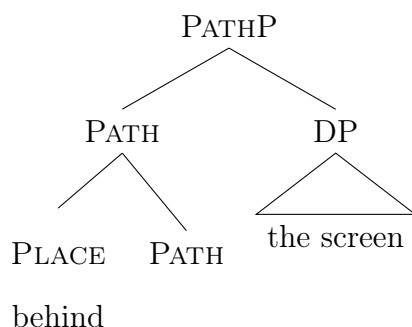
This modified just-add-path account, though it solves the type mismatch problem, makes the wrong prediction with respect to *halfway*-modification. In section 3.2.1, we saw that, contrary to Svenonius' proposed structure for directionalized PPs, which predicts that *halfway* should optionally modify 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 as 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.

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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 $\text{LOC}(S) \implies\!\!\!\!\!/ \;\; \text{DIR}(S)$).

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 →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 (Stroik, 2001; Hallman, 2004; Haddican, 2007), 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***
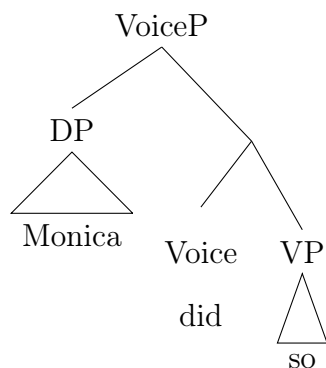
Consider the following examples of *do-so* replacement and locative PPs

(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 be interpreted as *danced* [$_{loc}$*behind the building*]. In (20-b), *did so on the track* has two possible interpretations: *ran* [$_{loc}$*on the track*], and *ran* [$_{dir}$*between the nets*] [$_{loc}$*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⟧	⟦*do so* PP2⟧
V PP1$_{\text{LOC}}$	V PP2$_{\text{LOC}}$
	*V PP2$_{\text{DIR}}$
	*V PP1$_{\text{LOC}}$ PP2$_{\text{LOC}}$
	*V PP1$_{\text{LOC}}$ PP2$_{\text{DIR}}$
V PP1$_{\text{DIR}}$	*V PP2$_{\text{LOC}}$
	*V PP2$_{\text{DIR}}$
	V PP1$_{\text{DIR}}$ PP2$_{\text{LOC}}$
	*V PP1$_{\text{DIR}}$ PP2$_{\text{DIR}}$

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)
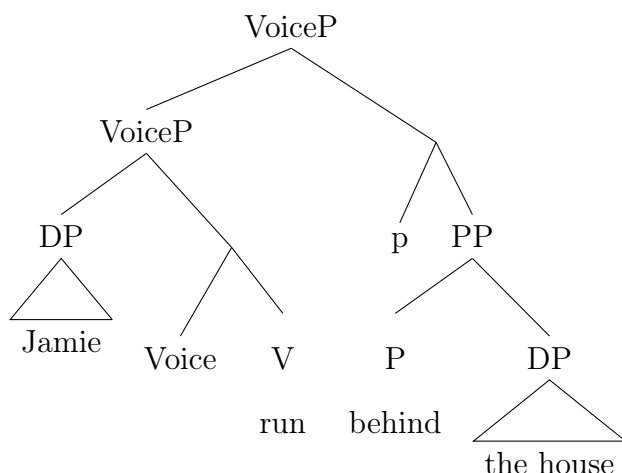
4.1.2   Semantics

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

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

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

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

                                                      (adapted from Heim and Kratzer, 1998)

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[4] As noted in fn 3, formal descriptions of spatial semantics are discussed at a fairly high level of abstraction.

(27)

$\langle s, t \rangle$

$\langle s, t \rangle$ $\langle s, t \rangle$

[[Jamie run]] $\langle l, \langle s, t \rangle \rangle$ l

loc^-

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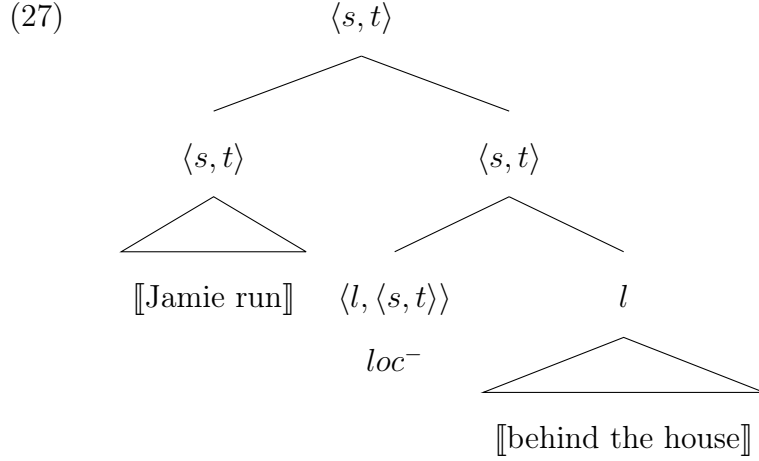
The denotation of VoiceP for the located motion reading of *Tim danced under the awning*, is demonstrated below.

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

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 argument 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**

```
                    TP
                   /  \
                  /    \
               DP       \
              /  \       \
             /____\      / \
          the ball   T    VP
                         /  \
                        /    \
                      V        SC
                               / \
                     roll      /   \
                            DP      PP
                           / \      / \
                          /___\    /___\
                      ⟨the ball⟩  behind the house
```
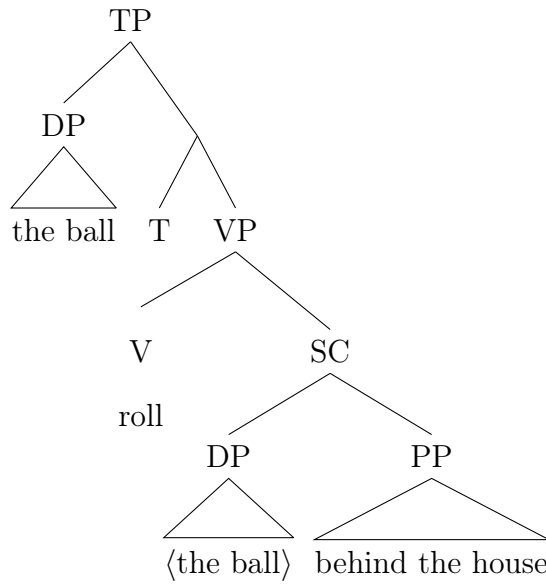
In the Complex Predicate analysis (as assumed by Collins, 1996), the PP merges with the lexical verb, forming a complex predicate which then merges with the Theme/Figure argument. In *the ball rolled behind the house*, the subject originates in the specifier of VP and moves to subject position.

(30) **Complex Predicate analysis**   (Collins, 1996)

```
                    TP
                   /  \
                  /    \
                DP      \
                /\       \
               /  \     /  \
          the ball  T   VP
                       /  \
                      /    \
                    DP      \
                    /\     /  \
                   /  \   /    \
             ⟨the ball⟩  V     PP
                         |    /  \
                       roll  /    \
                          behind the house
```
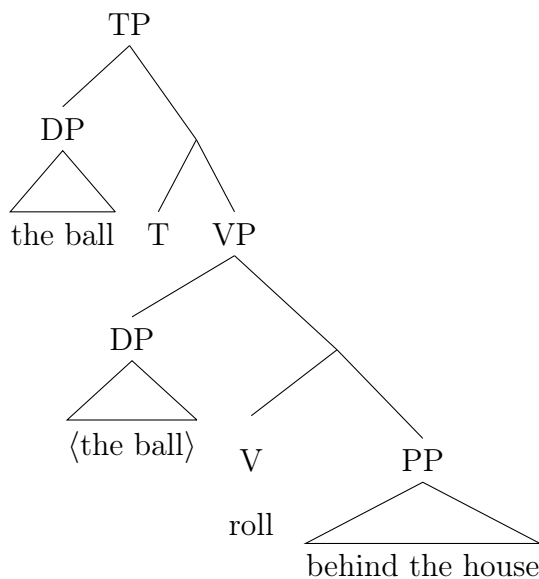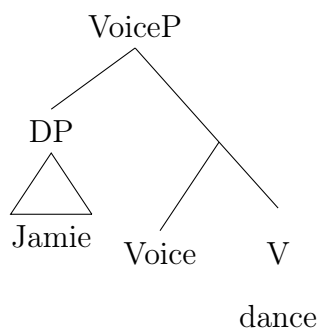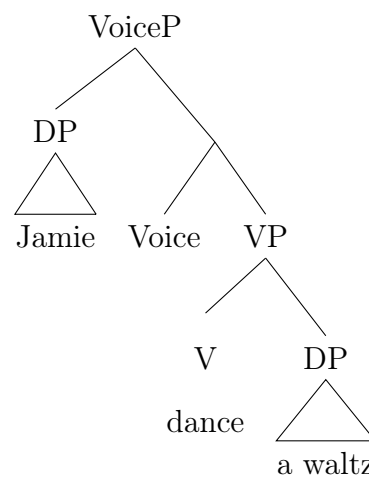
To compare these two analyses, let's consider the unergative verb *dance.* Unergatives, in their intransitive forms, do not project an internal argument, but can be optionally transitive. When they are transitive, their internal arguments are generally some sort of cognate object.

(31)   a. *Jamie danced*   b. *Jamie danced a waltz*

```
           VoiceP                                          VoiceP
          /     \                                         /     \
         /       \                                       /       \
        DP        \                                     DP        \
        /\       /  \                                   /\       /  \
       /  \     /    \                                 /  \     /    \
    Jamie  Voice     V                             Jamie  Voice     VP
                     |                                             /  \
                   dance                                          /    \
                                                                 V      DP
                                                                 |      /\
                                                               dance   /  \
                                                                    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 [DP a waltz [PP 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 Θ-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
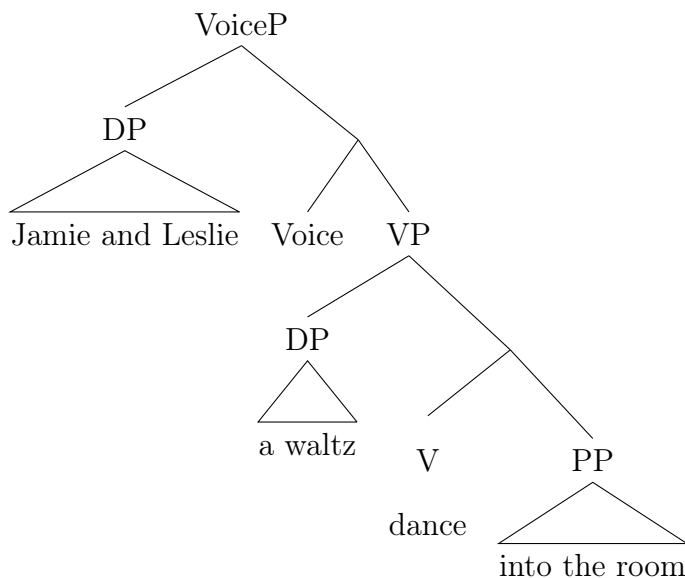
If we assume a Small Clause analysis for the structure of (32), we can see that it is ruled out by locality. According to a this analysis, the DP that is interpreted as the entity that moves

(*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.

(35)
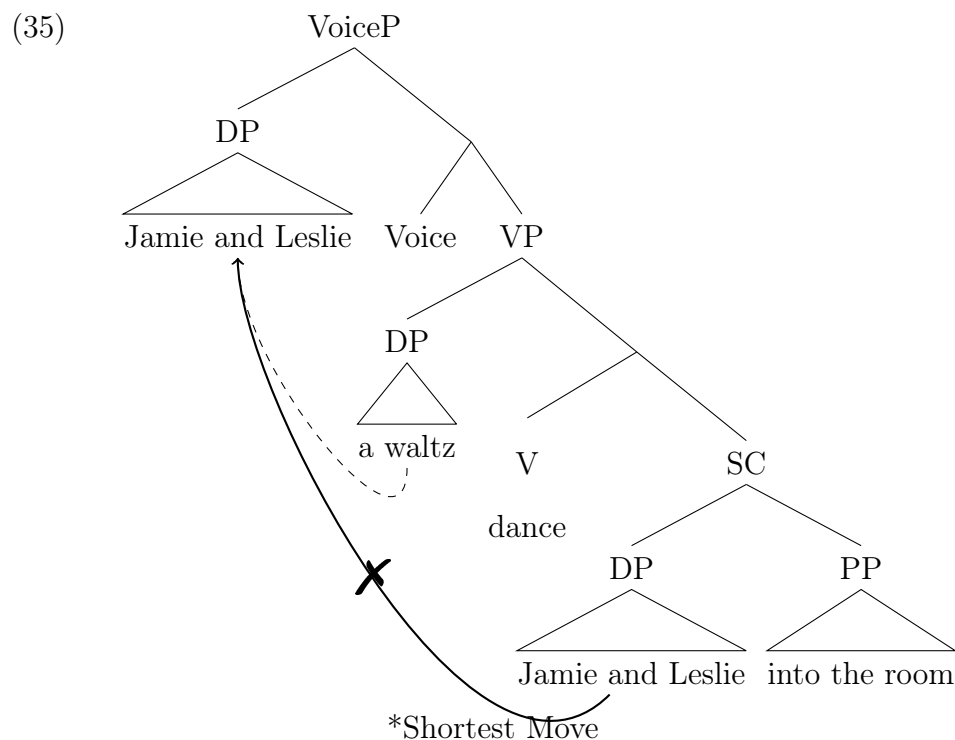
The Small Clause analysis of directional PPs, then, explains why cognate objects and directional PPs cannot co-occur in unergative VPs with nothing more than standard assumptions of locality. Were the verb and PP to form a complex predicate, however, there would be no reason to predict the ungrammaticality 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))

```
                    VoiceP
              ____/        \____
            DP                   \
          /    \              Voice    VP
    Each dancer      Voice       ___/    \___
                              DP              \
                            /    \          V       PP
                      their partner                /   \
                                      dance   into the room
```
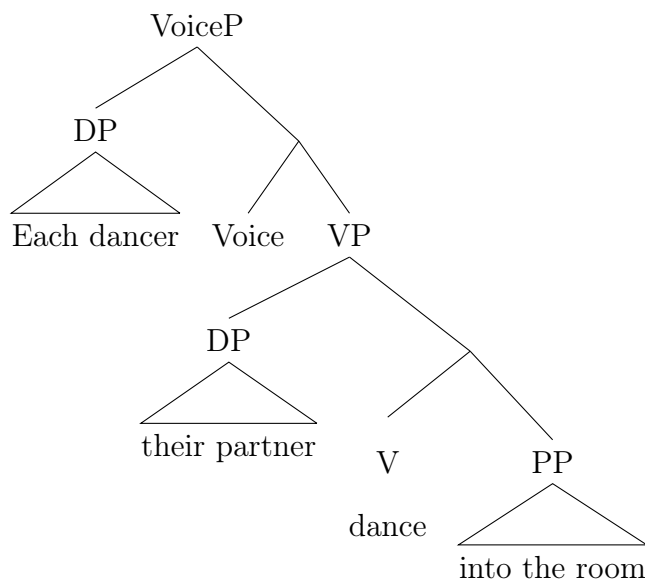
The Small Clause analysis gives structure for the grammatical parse of (32) (the one leading to the causative interpretation), that is different from the ungrammatical parse.

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

```
                    VoiceP
              ____/        \____
            DP                   \
          /    \              Voice    VP
    Each dancer          ___/    \___
                      V              SC
                    /              /    \
                dance          DP         PP
                             /    \      /    \
                      their partner  into the room
```
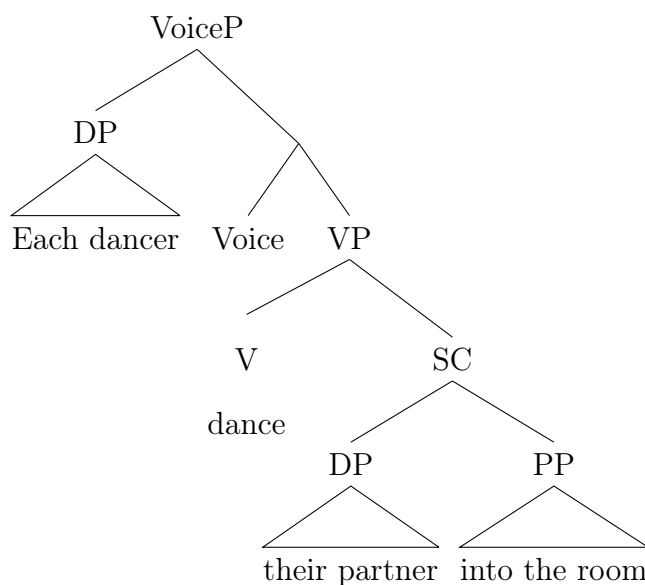
4.2.2 Semantics

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 the 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 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)   ⟦hammer the metal flat⟧ =

$\lambda e_s \exists s_s [\text{EVENT}(e) \land \text{HAMMER}(e) \land \text{STATE}(s) \land \text{FLAT}(\text{the metal})(s) \land \text{CAUSE}(s)(e)]$

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)   ⟦Doug run behind the house⟧ =

$\lambda e_s \exists s_s [\text{EVENT}(e) \land \text{RUN}(e) \land \text{STATE}(s) \land behind\_the\_house(\text{Doug})(s) \land \text{CAUSE}(s)(e)]$

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 holds 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) $\underbrace{\overbrace{s_0 \rightarrow s_1}^{e_0} \rightarrow s_2}_{e_3}$ where the e_1 brace spans $s_1 \rightarrow s_2$

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)

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(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 Resultatives	Directionalized 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).

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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.
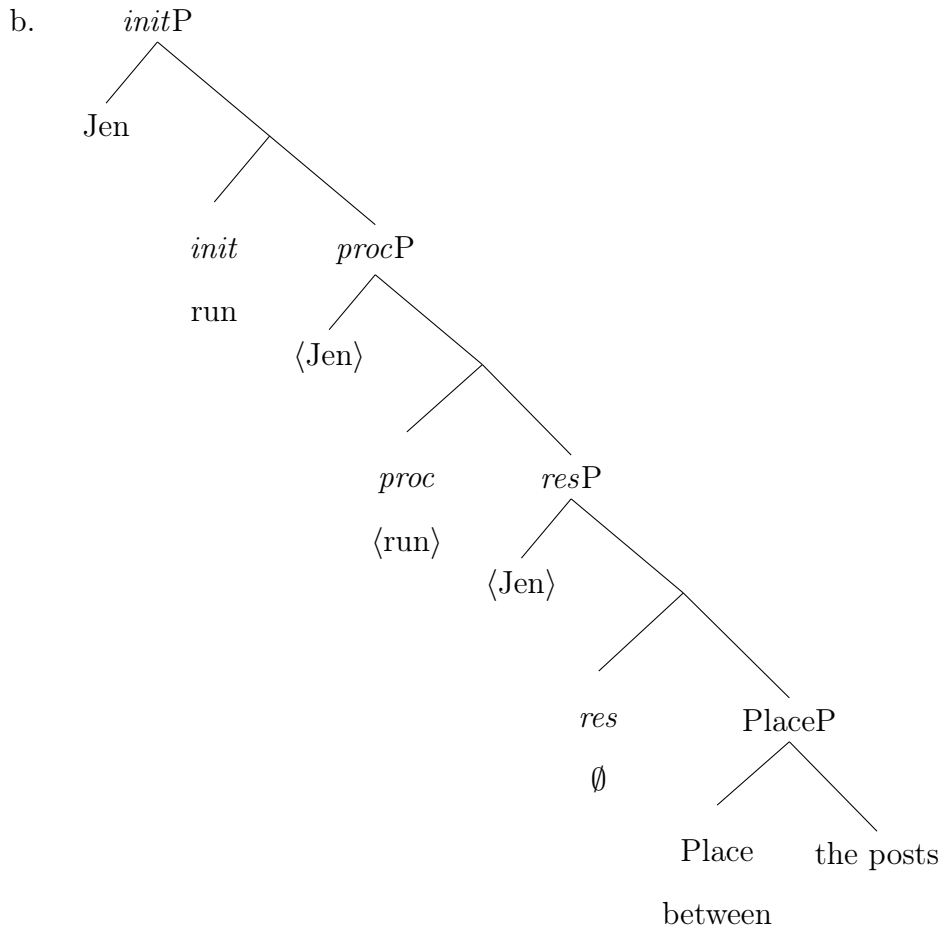
(52)   *Karena hammered the metal flat*

    a.   hammer[*init, proc*]   (Ramchand, 2008)

    b.

30
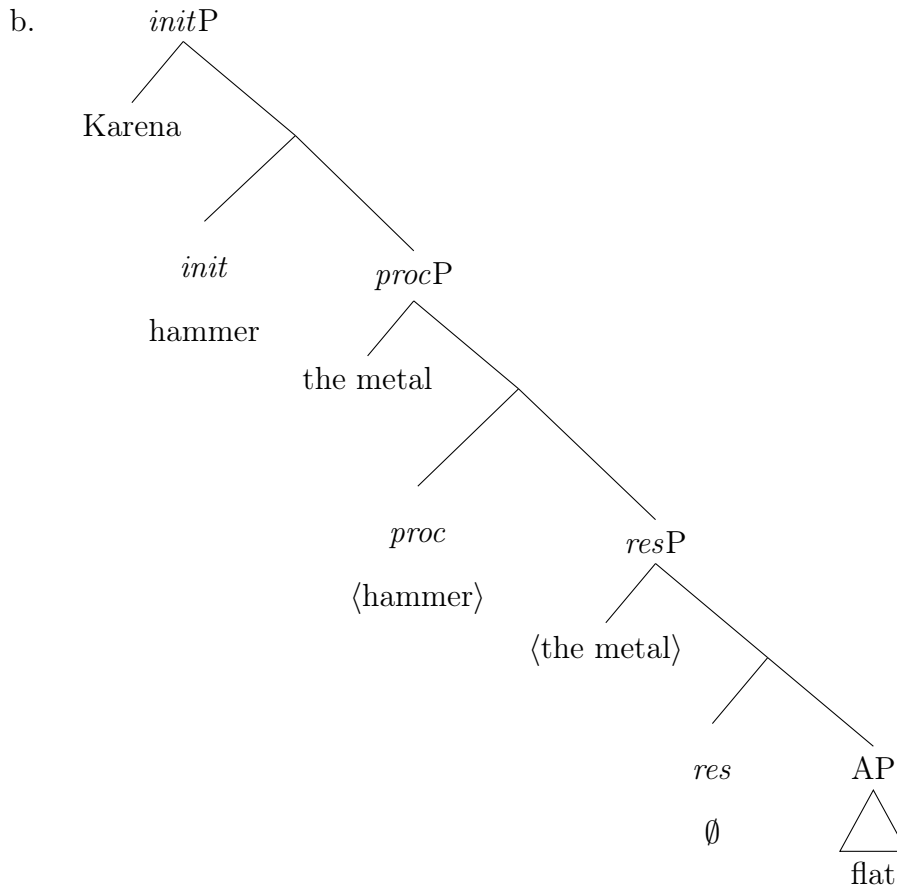
(53)   *Jen ran between the posts*

    a.   run[*init, proc*]

    b.

```
              initP
             /    \
          Jen      \
                  /  \
               init   procP
               run   /    \
                 ⟨Jen⟩     \
                          /   \
                       proc    resP
                      ⟨run⟩    /   \
                          ⟨Jen⟩     \
                                   /   \
                                res     PlaceP
                                 ∅      /    \
                                    Place    the posts
                                    between
```

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 *res*P. 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 *redden*. 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 derivational 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."

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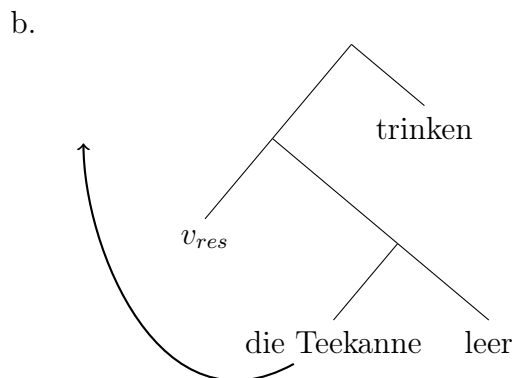
Kratzer proposes that, since v_{res} spells out as a derivational affix, it must attach to a stem. In German and English, v_{res} attaches to the bare adjective, but in languages whose adjectives show obligatory agreement, v_{res} is blocked from being attached to an inflected root.

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 α or β 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 labeling {XP, YP}: If XP and YP agree in some feature F, then {XP, YP} will receive the label $\langle F, F \rangle$, or if the 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 labeling algorithm. Since {XP, YP} objects are by their nature symmetric, there is no 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 φ-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*

35

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 ⟨F,F⟩. 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 [$_\delta$ [the ball] [$_\gamma$ kick [$_\beta$ v_{res} [$_\alpha$ [The ball]$_\varphi$ [between the posts]]]]]]

In its base generated form, the small clause α cannot be labelled. Only one of its members (the DP) has φ-features, so it cannot be labelled ⟨φ, φ⟩. The DP, then must raise to allow α 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 φ-features. Both members of a small clause, then, bear φ-features and as such the small clause gets the label ⟨φ, φ⟩, leaving no motivation for the DP to raise.

(64) a. *peint les murs blancs

   b. *[Voice [$_\delta$ [les murs] [$_\gamma$ peint [$_\beta$ v_{res} [$_\alpha$ [les murs]$_\varphi$ [blancs]$_\varphi$]]]]]

The resultative with the object *in situ* is unacceptable because objects in resultatives must raise out of the small clause for proper interpretation as the theme of the verb (in addition to the resultee), but the verbs in resultatives are optionally transitive (Kratzer, 2004) meaning the verbs' selectional requirements could not motivate raising the DP to theme position.

5.3 φ-Features on P and Hypothesis B

Crucial to the account I offer here is the proposal that prepositions in French have inherent φ-features. The fact that prepositions, unlike adjectives, show no agreement morphology makes this proposal seem stipulative, but there is motivation for it. Evidence for φ-features on P rests on the empirical claim that PP is a phase in certain languages (Abels, 2003), and the theoretical claim that phases are determined by the presence of φ-features (Chomsky, 2000).

Abels (2003) argues that P cannot be stranded in many languages because P is a phase head (or a bounding node in his terminology). Standard French is a prime example of a language which disallows P stranding as can be seen in the unacceptable strings in (65) and their acceptable English counterparts in (66).

(65) a. *C'est la personne que j'ai du trouble avec.

   b. *Qui as-tu fait ce gâteau pour?

   c. *Jean a été voté contre.   (Roberge and Rosen, 2013)

(66) a. This is the person I'm having trouble with.

   b. Who did you bake this cake for?

   c. John was voted against.   (Roberge and Rosen, 2013)

The unacceptability of extraction, however, cannot be evidence for a learner of the phasal nature of and φ-features inherent to P, as grammaticality judgements are absent in the data available to the learner. Hypothesis B however, ensures that phasality and φ-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 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.   *Oú   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 in a language 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 φ-features in that configuration. If adjectives have φ-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 labelable the small clause that it is evacuating from.

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 combination is interpreted as located motion, it is due to the PP being adjoined to 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.

References

Abels, Klaus. 2003. Successive cyclicity, anti-locality, and adposition stranding. Doctoral Dissertation, University of Connecticut.

Bach, Emmon. 1986. The algebra of events. *Linguistics and philosophy* 9:5–16.

Bochnak, M Ryan. 2013. Two sources of scalarity within the verb phrase. In *Studies in the composition and decomposition of event predicates*, 99–123. Springer.

Chomsky, Noam. 2000. Minimalist inquiries. In *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, ed. Roger Martin, David Michaels, and Juan Uriagereka. Cambridge: MIT Press.

Chomsky, Noam. 2013. Problems of projection. *Lingua* 130:33–49.

Chomsky, Noam. 2014. Problems of projection: Extensions. OLINCO Plenary lecture `www.youtube.com/watch?v=Icv_sCsIu6A`. Accessed 1 December 2014.

Cinque, Guglielmo, and Luigi Rizzi. 2010. *Mapping spatial PPs: The cartography of syntactic structures*, volume 6. Oxford: Oxford University Press.

Collins, Chris. 1996. *Local economy*. Cambridge: MIT Press.

Folli, Raffaella, and Heidi Harley. 2006. On the licensing of causatives of directed motion: Waltzing Matilda all over. *Studia Linguistica* 60:121–155.

Grewendorf, Günther. 1989. *Ergativity in German*, volume 35. Walter de Gruyter.

Haddican, Bill. 2007. The structural deficiency of verbal pro-forms. *Linguistic inquiry* 38:539–547.

Hallman, Peter. 2004. Constituency and agency in vp. In *Proceedings of the 23rd West Coast Conference on Formal Linguistics*, 304–317.

Harley, Heidi. 2005. How do verbs get their names? denominal verbs, manner incorporation, and the ontology of verb roots in English. In *The syntax of aspect*. Citeseer.

Heim, Irene, and Angelika Kratzer. 1998. *Semantics in generative grammar*, volume 13. Blackwell Oxford.

Hoekstra, Teun, and René Mulder. 1990. Unergatives as copular verbs; locational and existential predication. *The Linguistic Review* 7:1—79.

Kratzer, Angelika. 2004. Building resultatives. In *Event arguments in syntax semantics and discourse*, ed. Claudia Maienborn and Angelika Wöllstein-Leisten.

Lakoff, George, and John Robert Ross. 1976. Why you can't do so into the sink. *Syntax and Semantics* 7:101–111.

Maienborn, Claudia. 2001. On the position and interpretation of locative modifiers. *Natural Language Semantics* 9:191—240.

McGilvray, James A. 1991. *Tense, reference, & worldmaking*. Montreal & Kingston: McGill-Queen's University Press.

Moro, Andrea. 2000. *Dynamic antisymmetry*. 38. Cambridge: MIT Press.

Postal, Paul. 1974. *On raising: One rule of English grammar and its theoretical implications*. Cambridge: MIT Press.

Ramchand, Gillian. 2008. *Verb meaning and the lexicon*. Cambridge, UK: Cambridge University Press.

Ramchand, Gillian. 2013. Paths. Presented at GLOW 36 in Lund, Sweden.

Roberge, Yves, and Nicole Rosen. 2013. Preposition stranding and *que*-deletion in varieties of North American French. *Linguistica atlantica* 21:153–168.

Rooryck, Johan. 1996. Prepositions and minimalist case marking. In *Studies in comparative germanic syntax*, ed. Höskuldur Thráinsson, Samuel David Epstein, and Steve Peter, volume 2, 226–256. Dordrecht: Kluwer.

Stroik, Thomas. 2001. On the light verb hypothesis. *Linguistic Inquiry* 32:362–369.

Svenonius, Peter. 2003. Limits on P: filling in holes vs. falling in holes. In *Nordlyd 31.2*, ed. Anne Dahl, Kristine Bentzen, and Peter Svenonius, 431–445. University of Tromsø.

Svenonius, Peter. 2010. Spatial P in English. In *Cartography of syntactic structures*, ed. Guglielmo Cinque and Luigi Rizzi, volume 6. Oxford University Press.

Tungseth, Mai. 2005. PP, FP and the telic/atelic distinction in Norwegian motion constructions. In *Aspectual inquiries*, 147–168. Springer.

Tungseth, Mai Ellin. 2008. *Verbal prepositions and argument structure: Path, place and possession in Norwegian*, volume 121. John Benjamins Publishing.

Whelpton, Matthew. 2007. Building resultatives in Icelandic. In *Proceedings of the 34th Western Conference on Linguistics*, volume 17, 478–486.

Zwarts, Joost. 2005. Prepositional aspect and the algebra of paths. *Linguistics and Philosophy* 28:739–779.

Zwarts, Joost. 2006. Event shape: Paths in the semantics of verbs. Paper presented at the Workshop on the geometric structure of events, Konstanz October 7-8, 2004.

Zwarts, Joost, and Yoad Winter. 2000. Vector space semantics: A model-theoretic analysis of locative prepositions. *Journal of Logic, Language, and Information* 9:169–211.