The Czech Locative Chameleon

Tarald Taraldsen and Lucie Medová
CASTL Tromsø & Princeton University

Abstract

We show that under certain circumstances, the Czech locative prepositions (LOC) show up as directional prepositions (DIR) and vice versa, (under different circumstances) the Czech DIR PPs show up as LOC. We argue that such a chameleon life of the PPs is structurally dependent.

1. Introduction

The sentence in (1) illustrates the fact that certain Czech verbs of induced motion require a directional PP:[1]

(1) Jan hodil boty [do kouta]^{DIR} /*[v koutě].^{LOC}
Jan_{NOM} $threw_{3.SG}$ $boots_{ACC}$ $into\ corner_{GEN}$ / $in\ corner_{LOC}$
'Jan threw boots into the corner'

This property remains a property of participles used to form periphrastic verbal passives (2):

(2) Boty byly hozeny [do kouta]^{DIR} /*[v koutě].^{LOC}
$boots_{NOM}$ $were\ thrown_{SF.PL}$ $into\ corner_{GEN}$ / $in\ corner_{LOC}$
'The boots were thrown into corner'

---

[1]In this article, we are concerned with two sets of directional/locative PPs in Czech: do^{DIR} vs. v^{LOC} and na^{DIR} vs. na^{LOC} (distinguished by the case assigned to their complements; the directional *na* assigns ACC case to its complement, the locative *na* assigns LOC case). However, most of the primary prepositions in Czech are ambiguous between directional and locative meanings along the lines indicated by the preposition *na* above. We use the term *LOC* both as an abbreviation for the LOC case and as a shorthand for locative *LOC* as opposed to directional *DIR*. The following abbreviations are used: *NOM* – nominative, *GEN* – genitive, *ACC* – accusative, *LOC* – locative, *INSTR* – instrumental; *LF* – long form, *SF* – short form, *SG* – singular, *PL* – plural, *M* – masculine, *F* – feminine, *N* – neuter, *INF* – infinitive, *NEG* – negation, *AUX* – auxiliary, *IMP* – imperfective, *PF* – perfective.

However, an adjectival passive,[2] identified as such by the use of the long form of the participle in (3), has the locative PP, not the directional.

(3) Boty   byly   hozený   [v koutě].^{LOC}
     $boots_{NOM.PL}$ $were_{3.PL}$ $thrown_{LF.PL}$ $in corner_{LOC}$
     'The boots were thrown in the corner'

Conversely, (4) shows a verb that can be modified by a locative PP only.

(4) Marta   se   převlíkla   *[do šatny]^{DIR} /[v
     $Marta_{NOM}$ SE_{ACC} $change_{3.SG}$ $into dressing room_{GEN}$ $/in$
     šatně].^{LOC}
     $dressing room_{LOC}$
     'Marta changed in the dressing room'

When such a verb with the locative PP is embedded under a motion verb, as shown in (5), the locative PP shifts into a directional PP.

(5) Marta   se   šla   převlíknout [do šatny].^{DIR}
     $Marta_{NOM}$ SE_{ACC} $went_{3.SG}$ $change_{INF}$ $into dressing room_{GEN}$
     'Marta went to change in the dressing room'

What we want to know is, on one hand, why adjectival participles are incompatible with directional PPs (in Czech), as well as why the other forms of the relevant verbs require a directional rather than a locative PP. On the other hand, we want to know why the locative PP changes into a directional PP when embedded under a motion verb. We will argue that answering these questions requires not only an understanding of the syntax and semantics of spatial PPs, but also a decompositional analysis of verbs and a specific account of how DPs interact with event-denoting verbal heads.

The following sections are divided into two major parts followed by a concluding section. In the first part, we try to answer the question why directional PPs should be incompatible with adjectival participles. The second part develops an account of the fact that verbs of induced motion require directional PPs rather than locatives.

2. Locatives instead of directionals

We first expand and discuss the subset of the Czech data that features locatives instead of directionals. To reach an understanding of why a directional PP must be replaced by a locative with adjectival passives, we start out by adopting what appears the most promising account of the differences (and similarities) between directional and locative PPs. Then, we

---

[2]Only Target-state adjectival participles — as opposed to Resultant-state participles — have this property, as discussed at length in the text.

investigate how this account will interact with different analyses of Target State participles.

2.1. Data I

Certain verbs of induced motion require directional prepositions in Czech,[3] as shown in (6) ((6a) is repeated from (1) above).

(6)   a.   Jan   hodil   boty   [do kouta]^{DIR} /*[v
           Jan$_{NOM}$ threw$_{3.SG}$ boots$_{ACC}$ into corner$_{GEN}$ / in
           koutě].^{LOC}
           corner$_{LOC}$
           'Jan threw boots into the corner'
   b.   Ivona   pověsila kabát   [na věšák]^{DIR} /*[na
           Ivona$_{NOM}$ hung$_{3.SG}$ coat$_{ACC}$ onto hanger$_{ACC}$ / on
           věšáku].^{LOC}
           hanger$_{LOC}$
           'Ivona hung a coat on a hanger'

The directional preposition is retained in eventive passives, identified by the short form of the participle (SF), as shown in (7).

(7)   a.   Boty   byly   **hozen-y**   [do kouta]^{DIR} /*[v
           boots$_{NOM}$ were$_{3.PL}$ thrown-$_{SF.PL}$ into corner$_{GEN}$ / in
           koutě].^{LOC}
           corner$_{LOC}$
           'The boots were thrown into corner'
   b.   Kabát   byl   **pověšen-Ø**   [na věšák]^{DIR} /*[na
           coat$_{NOM}$ was$_{3.SG}$ hung-$_{SF.SG.M}$ onto hanger$_{ACC}$ / on
           věšáku].^{LOC}
           hanger$_{LOC}$
           'The coat was hung on a hanger'

However, an adjectival passive, identified as such by the use of long form of the participle (LF), surprisingly allows the locative to alternate with the directional, as shown in (8).

---

[3] As pointed out to us by Pavel Caha, Věra Dvořáková Procházková and Michal Starke, the PP seems obligatory except when the verb itself can be focused and bears the appropriate intonation, as shown in (i).

(i)   Jan   ty   boty   ([do kouta]^{DIR} /*[v koutě]^{LOC}) HODIL,   ne
     Jan$_{NOM}$ these boots$_{ACC}$ into corner$_{GEN}$ / in corner$_{LOC}$ threw$_{3.SG}$ NEG
     položil.
     put$_{3.SG}$
     'Jan THREW the boots, he didn't put them down'

This suggests that the endpoint of a trajectory described by a verb of induced motion can be contextually determined when the focus is on the process component of the verb. When obligatory, the PP can never be a locative in (6) and (7).

(8) a. Boty   byly   **hozen-ý**   [do kouta]^{DIR} /[v
         boots$_{NOM}$ were$_{3.PL}$ thrown-$_{LF.PL}$ into corner$_{GEN}$ /in
         koutě].^{LOC}
         corner$_{LOC}$
         'The boots were thrown in(to) the corner'
     b. Kabát   byl   **pověšen-ej** [na věšák]^{DIR} /[na
         coat$_{NOM}$ was$_{3.SG}$ hung-$_{LF.SG.M}$ onto hanger$_{ACC}$ /on
         věšáku].^{LOC}
         hanger$_{LOC}$
         'The coat was hung on(to) a hanger'

A note on the Czech participles is in order now. The long forms are
inflected as adjectives, in contrast to the short forms inflected as nominal
elements. The long forms are the only ones occurring in prenominal po-
sition, while the short forms are used in eventive passive (Veselovská and
Karlík 2004). However, for the majority of speakers of colloquial Czech
the long forms tend to replace the short forms in the eventive passives as
well. However, no speaker accepts the locative PP replacing the directional
in the presence of an agentive instrumental, which is only compatible with
eventive passives, as shown in example (9).

(9) a. Boty   byly   **hozen-y**   [do kouta]^{DIR} /*[v
         boots$_{NOM.PL}$ were$_{3.PL}$ thrown$_{SF.PL}$ into corner$_{GEN}$ / in
         koutě]^{LOC} Janem.
         corner$_{LOC}$ Jan$_{INSTR}$
         'The boots were thrown into corner by Jan'
     b. Boty   byly   **hozen-ý**   [do kouta]^{DIR} /[v
         boots$_{NOM.PL}$ were$_{3.PL}$ thrown$_{LF.PL}$ into corner$_{GEN}$ /in
         koutě]^{LOC} (*Janem).
         corner$_{LOC}$ Jan$_{INSTR}$
         'The boots were thrown in(to) the corner'

Even more surprisingly, when the adjectival passive has the Target-state
(TS) reading of Kratzer (2000), as discussed further and as shown in (10),
only the locative can be used. Notice that the locative PPs in (10) (and in
(8), when used instead of the directional) are obligatory to the same extent
as the directionals in the preceding examples.

(10)   Nene, Petr   určitě   je   někde   v budově,   podívej,
        nono, Petr$_{NOM}$ sincerely be$_{3.SG}$ somewhere in building$_{LOC}$ look

     a. boty   má   *ještě pořád* **hozen-ý**   [v koutě]^{LOC}
         boots$_{ACC.PL}$ have$_{3.SG}$ still   thrown$_{LF.PL}$ in corner$_{LOC}$
         /??[do kouta].^{DIR}
         / into corner$_{GEN}$

b. kabát   má   *ještě pořád* **pověšen-ej** [na věšáku]^{LOC}
   coat$_{ACC}$ have$_{3.SG}$ still   *hung-$_{LF.SG.M}$ onto hanger$_{ACC}$*
   /??[na věšák].^{DIR}
   / *on hanger$_{LOC}$*
'No, Petr must still be here in the building, look: his boots are still thrown in the corner and his coat is still hanging on the hanger'

We will assume, like Kratzer (2000) and others, that there are (at least) two different types of adjectival participles, resultant state participles (RS-participles) and target state participles (TS-participles). Only TS-participles cooccur with *still*, as argued by Kratzer (2000). (Below we add three more tests tailored for Czech to distinguish between RS-participles and TS-participles.) Thus, we take (10) to show us that TS-participles formed from verbs of induced motion obligatorily replace a directional PP with the corresponding locative. All other forms of these verbs retain an obligatory directional PP. The apparent optionality manifested by the sentences in (8) is just an illusion due to the fact that RS-participles and TS-participles cannot be told apart in the absence of *still*.

Durative adverbials like 'for two hours' in (11a) or 'for three days' in (11b) occur only with TS-participles.

(11)   a.   Ta hlína   byla **naložen-á**   [na traktoru]^{LOC} /??[na
          this soil$_{NOM}$ be$_{3.SG}$ loaded$_{LF.SG.F}$ on tractor$_{LOC}$ / onto
          traktor]^{DIR} *dvě hodiny.*
          tractor$_{ACC}$ two hours
          'The soil was loaded on the tractor for two hours' (Caha 2006:21)
   b.   Kůzlata   jsou   už   *tři dny* **zavřen-ý** [v
          kids$_{NOM.PL}$ are$_{3.PL}$ already three days closed$_{LF.PL}$ in
          chlívku]^{LOC} /??[do chlívka].^{DIR}
          shed$_{LOC}$ / into shed$_{GEN}$
          'The kids have been shut in the shed already for three days'

The TS-participle in (11) contrast rather sharply with ungrammatical examples in (12). The participles in (12) are inherently incapable of being TS-participles and thus cannot combine with a durative adverbial like 'for two hours,' as shown in (12a) nor with 'still,' as shown in (12b).

(12)   a.   *Ten požár   byl   uhašen-ej   *dvě hodiny.*
          this fire$_{NOM}$ was$_{3.SG}$ extinguished$_{LF.SG}$ two hours
          ('The fire was extinguished for two hours')
   b.   *Ten požár   je   *ještě pořád* uhašen-ej.
          this fire$_{NOM}$ is$_{3.SG}$ still   *extinguished$_{LF.SG.M}$*
          Intended: 'The fire is still extinguished'

Second, *have*-passives distinguish between the T-state and R-state participles in the following way. Example (13) shows the basic sentence with an obligatory directional PP.

(13) Petr   naložil   Karlovi   hlínu   [na traktor]^{DIR} /*[na
      Petr$_{NOM}$ loaded$_{3.SG}$ Karel$_{DAT}$ soil$_{ACC}$ on tractor$_{ACC}$ / on
      traktoru].^{LOC}
      tractor$_{LOC}$
      'Petr loaded the soil on the tractor for Karel'   (Caha 2006:20)

When the original agent *Petr* appears in the nominative under a *have*-passive (and the relevant reading is 'managed'), only a directional PP is available, as shown in (14).

(14) Petr   už   má   tu hlínu   **naložen-ou**   [na
      Petr$_{NOM}$ already has$_{3.SG}$ this soil$_{ACC}$ loaded-$_{LF.ACC.SG}$ onto
      traktor]^{DIR} /*[na traktoru].^{LOC}
      tractor$_{ACC}$ / on tractor$_{LOC}$
      'Petr has already loaded the soil on the tractor'   (Caha 2006:22)

On the other hand, if the original dative argument *Karel* is promoted to the nominative under *have*-passive (and the reading is stative), the locative PP is strongly preferred, as shown in (15).

(15) Karel   má   tu hlínu   **naložen-ou**   [na
      Karel$_{NOM}$ have$_{3.SG}$ this soil$_{ACC.SG}$ loaded-$_{LF.ACC.SG}$ on
      traktoru]^{LOC} /??[na traktor]^{DIR} dvě hodiny.
      tractor$_{LOC}$ / onto tractor$_{ACC}$ two hours
      'The soil is loaded on the tractor for two hours on Karel.'

                                                        (Caha 2006:23)

An additional set of examples is shown below.

(16) Karel   vytetoval   Ivoně   *[na kotníku]^{LOC} /[na
      Karel$_{NOM}$ tattooed$_{3.SG}$ Ivona$_{DAT}$ on ankle$_{LOC}$ /onto
      kotník]^{DIR} slunce.
      ankle$_{ACC}$ sun$_{ACC}$
      'Karel tattooed a sun on Ivona's ankle'

(17) a. Karel   má   to slunce *[na kotníku]^{LOC} /[na
          Karel$_{NOM}$ has$_{3.SG}$ this sun$_{ACC}$ on ankle$_{LOC}$ /onto
          kotník]^{DIR} už   **vytetovan-ý**.
          ankle$_{ACC}$ already tattooed-$_{LF.ACC.SG}$
          'Karel has tattooed a sun on an ankle'
      b. Podívej, Ivona   má   [na kotníku]^{LOC} /??[na
          look   Ivona$_{NOM}$ has$_{3.SG}$ on ankle$_{LOC}$ / onto
          kotník]^{DIR} **vytetovan-ý**   slunce!
          ankle$_{ACC}$ tattooed-$_{LF.ACC.SG}$ sun$_{ACC}$
          'Look, Ivona has a sun tattooed on her ankle!'

We take it that *have*-passives with an agentive subject require a RS-participle, whereas the participle can be T-state with a 'promoted' dative.

Third, a participle embedded under *zůstat* 'remain' is T-state.

(18)   a.   Po   Petrovi   zůstaly   Karlovi   jenom boty
            after Petr$_{LOC.SG}$ remained$_{3.PL}$ Karel$_{DAT}$ only   boots$_{NOM}$
            hozen-ý   [v koutě]^{LOC} /??[do kouta].^{DIR}
            thrown-$_{LF.PL}$ in corner$_{LOC}$ / into corner$_{DIR}$
            'The only thing that Karel had left after Petr are the boots thrown in the corner'

       b.   Ivoně   zůstal   po dědovi   jenom
            Ivona$_{DAT}$ remained$_{3.SG}$ after grandpa$_{LOC.SG}$ only
            kabát   **pověšen-ej** [na věšáku]^{LOC} /??[na věšák].^{DIR}
            coat$_{NOM}$ hung-$_{LF.SG}$ on hanger$_{LOC}$ / onto hanger$_{ACC}$
            'What Ivona got after her grandpa is the coat hanging on the hanger'

       c.   Karlovi   zůstala   přes noc   [na traktoru]^{LOC} /??[na
            Karel$_{DAT}$ remained$_{3.SG}$ over night on tractor$_{LOC}$ / onto
            traktor]^{DIR} **naložen-á**   hlína.
            tractor$_{ACC}$ loaded-$_{LF.SG}$ soil$_{NOM.SG}$
            'Karel wound up with soil loaded up on his tractor overnight'

       d.   A   po   tom románku   zůstalo   Ivoně   [na
            and after this romance$_{LOC}$ remained$_{3.SG}$ Ivona$_{DAT}$ on
            kotníku]^{LOC} /??[na kotník]^{DIR} **vytetovan-ý** slunce.
            ankle$_{LOC}$ / onto ankle$_{ACC}$ tattooed-$_{LF.SG}$ sun$_{NOM.SG}$
            'And after that romance Ivona still has a sun tattooed on her ankle'

       e.   Kůzlata   zůstaly   tři   dny **zavřen-ý**   [v
            kids$_{NOMG}$ remain$_{3.SG.F.PAST}$ three days closed-$_{LF.SG.F}$ in
            chlívku]^{LOC} /??[do chlívka].^{DIR}
            shed$_{LOC}$ / into shed$_{GEN}$
            'The kids wound up being shut in the shed for three days'

2.2. Paths and locations

To model the interaction between verbal structures and directional PPs, we will adopt the notion of 'path' as employed by Zwarts (2005): Paths are "continuous functions from the real unit interval [0,1] (the 'indices') to positions in some model of space" (Zwarts 2005:9). According to Zwarts, directional PPs denote sets of paths.

Still following Zwarts (2005), the link between the verbal structure and a directional PP modifying it, would be provided by a trace function τ defined on events. For any event e in the denotation of a V(P) of motion, $\tau(e)$ returns its 'spatial trace,' "the path followed by the theme of e" (Zwarts 2005:17). Given this, modification of a V by a directional PP can be thought

of as in (19):

(19) $[\![V\ PP]\!] = \{e\ \text{in}\ [\![V]\!]\text{:}\ \tau(e)\ \text{in}\ [\![PP]\!]\}$ (Zwarts 2005:25)

Consider, for example, how the directional PP affects the interpretation of *walked* in (20):

(20)   John walked into the forest.

On its own, *walked* would be atelic, i.e., the set of events in its denotation is cumulative. But, as Zwarts shows, once (19) applies all events that are concatenations of events e and e' also in the denotation of *walked* will be weeded out, since *into* is not cumulative, and so, if the denotation of *into the forest* contains paths corresponding to $\tau(e)$ and $\tau(e')$, it won't also contain $\tau(e + e')$ (= $\tau(e)+\tau(e')$).

By contrast, locative PPs do not denote sets of paths, but locations, e.g., as in Kracht (2002), who also argues that directionals are composed out of location-denoting expression embedded under an element adding paths going into those locations; (cf. also van Riemsdijk and Huybregts 2002). On this view, the two pairs of Czech directional/locative prepositions used in (6) — (10) might be analyzed as in (21), where LOC is a location denoting element and DIR represents the added higher component creating paths:

(21)   a. $v = \text{LOC}_1$, $do = [\text{DIR}\ [\text{LOC}_1]]$
          b. $na_{LOC} = \text{LOC}_2$, $na_{ACC} = [\text{DIR}[\text{LOC}_2]]$

The two types of LOC are differentiated from each other by the way they relate the locations in their denotation to their DP argument (the 'landmark'), like *in* vs. *on*. This distinction is inherited by the two directionals. Notice that the morphology of these Czech directionals does not reflect this decomposition, unlike, for instance, English *into*.

2.3. TS-participles according to Kratzer (2000)

Kratzer's (2000) account has it that TS-participles are formed by a stativizer, which we will notate as *-en$_T$*, attaching to a verb phrase or a verb stem.The semantics of *-en$_T$* is given in (22), restricting attention to the phrasal case:

(22) $[\![-en_T]\!] = \lambda R \lambda s \exists e\ R(s)(e)$ (Kratzer 2000:14)

That is, *-en$_T$* will apply to verb phrases with both a state and an event argument, and existentially close the event argument. The expression emerging from application of *-en$_T$* will therefore denote a set of states.

In view of the analysis of directional PPs just reviewed, this seems to take us some way towards an explanation of why Czech TS-participles refuse to combine with directional PPs, as seen in (10). If the trace function feeding the application of (19) is restricted to events, as opposed to states,

it will follow from (22) that a directional PP cannot combine with a verb (phrase) once $-en_T$ has attached to it.

But, of course, to go all the way, we would need a guarantee that a directional PP cannot be introduced before $-en_T$ is attached. In fact, nothing in Kratzer's analysis seems to exclude this possibility. Directional PPs are modifiers and as such do not change the semantic type of the verb (phrase) they apply to, i.e., if $-en_T$ is applicable to a given verb (phrase), it should remain applicable after a directional PP has been added to that verb (phrase). Since, as Kratzer shows, $-en_T$ can attach to phrase (not only to a head), there should be no obstacle to building a phrase from a verb (phrase) and directional PP, attaching $-en_T$ to the output. So, the guarantee can only be delivered by stipulation, it seems.

The stipulation has to say that directional PPs attach after $-en_T$, but before $-en_R$, the stativizer creating RS-participles in Kratzer's system:

(23) $[\![-en_R]\!] = \lambda P \lambda t \exists e \; [P(e) \; \& \; \tau(e) < t]$ (Kratzer 2000:24)

(8) tells us that RS-participles derived from verbs of induced motion continue to select directional PPs in Czech. But if RS-participles are formed by attachment of $-en_R$ with the semantics given in (23), they denote sets of times. Directional PPs, however, only attach to event-denoting expressions. Therefore, $-en_R$ must be allowed to apply after a directional PP has been introduced, giving the order of applications shown in (24):

(24) $-en_R \; > \; directional \; PP \; > \; -en_T$

That is, on standard assumptions about how the order of application is imposed, $-en_R$, directional PPs and $-en_T$ seem to occur in different positions in the (verbal) functional sequence:

(25) $[\; -en_R \; [\; directional \; PP\ldots \; [\; -en_T\ldots V \; \ldots$

2.4. No TS-participle from *hodit* and *pověsit*?

Before moving on, we would like to counter an obvious challenge to the conclusion we draw from the data in §2.1: Kratzer (2000:10-11) uses the contrast in (26)–(27) to motivate an analysis that allows certain modifiers, like *schlampig* 'sloppily,' to create a target-state predicate by modifying an RS-participle (e.g., *geschnitten* 'cut'):

(26)   *Meine Haare waren immer noch geschnitten.
        my   hair   was   still   cut

                                                (Kratzer 2000:21a)

(27)   Meine Haare waren immer noch schlampig geschnitten.
        my   hair   was   still   sloppily   cut
   'My hair was cut sloppily'   (Kratzer 2000:21b)

She endows *schlampig* with the power to combine with an RS-participle to form a predicate denoting states carrying the indication that they came about as a result of a sloppy action (of the kind specified by the verb root).

Analogously, we might want to claim that (Czech) *hozenej* 'thrown$_{M.SG}$' and *pověšenej* 'hanged$_{M.SG}$', like *geschnitten*, can only be RS-participles, taking the locative PPs in (10) to be able to create a predicate denoting states of being in some location (specified by the locative PP) as the result of some action (specified by the RS-participle). If so, directional PPs would be excluded from (10) simply because only locative PPs denote states.

In fact, the locative PPs of (i) from footnote 3, for example, at first appear obligatory, as this analysis would predict. But then again, so do their directional counterparts in (6)–(8), and yet, closer scrutiny reveals that in this case, the obligatoriness is lifted under certain conditions involving prosody, among other things; cf. footnote 3. Now, it turns out that under the same conditions, the PPs can be omitted in (10) too. So, after all, Czech verbs of induced motion, like *hodit* 'throw' and *pověsit* 'hang,' do form TS-participles. (The denotation of these TS-participles could perfectly well be states corresponding to being in some contextually determined location as the result of an action of the kind named by the verb root.)

2.5. A decompositional account of TS-participles

The need to assume a structural analysis like (25) suggests that there might be a less stipulative account of RS- vs. TS-participles stemming from recent proposals decomposing verbs into strings of event-denoting (semi-) functional heads, e.g., Ramchand's (in press) account, according to which an achievement/accomplishment predicate like the ones in (6) might break up as shown in (28), leaving the PP out of the picture for now:

(28)
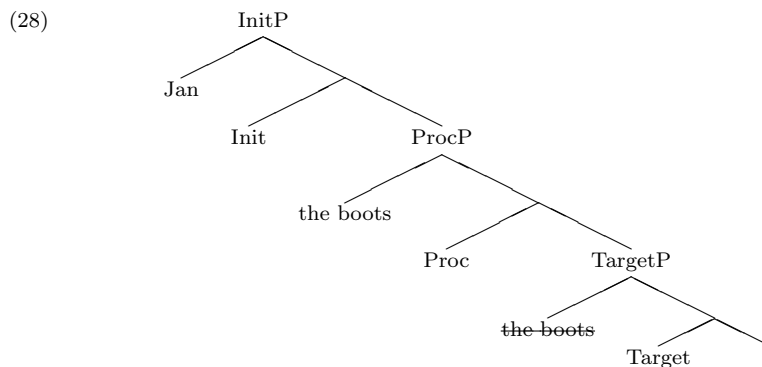
The verb root lexicalizes all three of the *Init(iation)*, *Proc(ess)* and *Target* (labeled *Res(ult)* by Ramchand) heads in the general case. The direct object is both 'holder of the target state' (subject of the TargetP)

and 'undergoer of process' (subject of the ProcP). From this perspective, we might view the different participles displayed in (7)–(10) as corresponding to different chunks of (28):[4]

(29)   a.   [-*en* [Jan *Init* [the boots *Proc* [the boots *Target* . . .
         b.   [-*en* [the boots *Proc* [the boots *Target* . . .
         c.   [-*en* [the boots *Target* . . .

The structure of a participle occurring in a verbal passive would be (29a), bringing with it an 'Initiator' capable of surfacing as an agentive instrumental. (29b) would an adjectival RS-participle, while (29c), following a proposal by Michal Starke, would be the corresponding TS-participle.Thus, the RS-participle and the TS-participle both lack the ability to have an agentive instrumental, simply because the verbal projection is aborted before it reaches the level where agents ('initiators') are introduced. In addition, the TS-participle lacks the 'dynamic' component Proc present in the RS-participle. This, we propose, is the reason why directional PPs combine with RS-participles, but not with TS-participles.

Lexicalizing the Target head, the verb roots just 'names' a state, i.e., TargetP denotes a set of states, as opposed to events. Thus, it follows that a directional PP cannot attach to it. The lowest a directional can attach is ProcP, denoting (relations between states and) events:

(30)   . . . (PP_{DIR}) [the boots *Proc* *(PP_{DIR})[the boots *Target* . . .

So, this line of approach doesn't need a stipulation to make directional PPs incompatible with TS-participles, essentially because, unlike Kratzer's account, it doesn't assume the presence of event-denoting elements at any stage of the derivation of a TS-participle: TS-participles do not become stative by having their event arguments closed. They do not have event arguments to begin with. Notice also that since locative PPs do cooccur with TS-participles, the decomposition of directional Ps in (21) (repeated here as (31)) now comes to suggest that directional Ps are assembled across two levels of verbal functional structure, as in (32):

(31)   a. $v = LOC_1$, $do = [DIR [LOC_1]]$
         b. $na_{LOC} = LOC_2$, $na_{ACC} = [DIR[LOC_2]]$

(32)   . . . **DIR** [the boots *Proc* [**LOC** [the boots *Target* . . .

---

[4]The structure of an active participle of the Romance and Germanic variety should presumably properly contain (29a), containing additional functional structure to allow the agent DP to find its way to the structural subject position (as opposed to surfacing inside a *by*-phrase).

2.6. Some additional considerations supporting the decompositional approach

It seems desirable to have a uniform analysis of the participle-forming suffix -*en*, i.e., -*en$_R$*, -*en$_T$* and the -*en* forming verbal participles should all do the same thing. Otherwise, the fact that they spell out exactly the same way in all of Germanic, Romance and Slavic will remain unaccounted for.[5] Kratzer (2000:9) suggests that "the overt participle morphology would be meaningless, and its only function would be to license the absence of verbal inflection," a view akin to saying that -*en* allows the verbal functional projection to abort.

However, Kratzer's analysis still doesn't allow one to say that a TS-participle is simply what emerges when a verbal projection is cut early, since the stativizer associated with -*en$_T$* clearly cannot be part of the verbal functional sequence. Rather, as Kratzer suggests, it must be part of a distinct sequence of functional categories associated with adjectives. So, she is led to assume that participles can be converted to adjectives, either by an adjective-forming Ø suffix, as in Lieber (1980), or by 'pure' conversion. The stativizer yielding TS-participles would then either be the adjective-forming Ø or the label A itself, according to Kratzer. But if TS-participles are adjectives formed by a derivational suffix, we again lose any hope of explaining why the morphology of TS-participles is exactly like the morphology of other participles across Germanic, Romance and Slavic, since there is no reason why the adjective-forming suffix should be uniformly Ø. On the other, if 'pure' conversion from verbal participle to adjective, unmediated by affixation, is a universally available option, one is led toward a view adopted by Baker (2003): Verbs embed adjectives, and so, adjectives emerge when a verbal projection is interrupted early on. But then, as argued by Michal Starke in ongoing work, the adjectival functional sequence is a proper subpart of the verbal functional sequence, and there is no room for the stativizer associated with TS-participles. Notice finally that dissociating the stativizer from -*en*, so that -*en$_T$* and -*en$_R$* become indistinguishable from one another, would seem to make it impossible even to stipulate that directional PPs may attach before -*en$_R$*, but not before -*en$_T$*.

On the other hand, Kratzer argues against a decompositional approach on the basis of two objections, which we now need to deal with. First, she points out that 'compositional causatives' like German *leeren* 'empty' do not form TS-participles. But this would have target state denoting subparts, e.g., one corresponding to *leer* 'empty,' on a decompositional analysis. So, why cannot the stativizer deriving TS-participles, the one associated with -*en$_T$* in (22) (repeated here as (33)), 'see' that constituent of the verb?

---

[5]Since the affix forming active past participles in Germanic and Romance is likewise identical to the -*en* forming verbal passives and the two kinds of adjectival participles, it too should be taken to do the same thing as the -*en* creating the various passive participles.

(33) $[\![-en_T]\!] \;=\; \lambda R\lambda s\exists e\; R(s)(e)$

Second, some morphologically complex verbs, like *aufpumpen* 'pump up,' make good TS-participles, even though, Kratzer claims, there is no candidate for a head of the TargetP (under a decompositional analysis), as *auf-*, in this collocation, has no independent denotation.

However, decompositional analyses are vulnerable to the second objection only to the extent they are committed to claiming that the head of the Target Phrase (using Ramchand's decomposition, for concreteness) would necessarily have to be the separable prefix *auf* rather than *pump-* or even *auf-pump-*. But, in fact, like Ramchand, we assume that verb root may itself lexicalize the head position of the TargetP.

Countering the first objection involves answering the question why deadjectival verbs like *leeren* 'empty' do not form TS-participles, a question which Kratzer too obviously has to answer. Her account is based on the observation that German combinations of *machen* 'make' and an adjective systematically fail to produce TS-participles. She suggests that this is because a 'light verb' is inherently categorized as a V, as opposed to initially category-neutral verbal roots, and only category-neutral root can have both an event argument and a state argument: Verbs lose the state argument. Adjectives lose the event argument. Then, she points out that this analysis extends to *leeren* 'empty' if these involve covert light verbs embedding a category-neutral root. Notice that the reference to the 'light verb' status of *machen* in combination with adjectives is crucial. In other contexts, *machen* happily forms TS-participles. (34), for example, is fine in the context of an (unsuccessful) attempt to change the molecular composition of objects:[6]

(34)   Der Löffel ist immer noch aus   Eisen gemacht.
       the spoon is still   from iron   made
       'The spoon is still made of iron'

So, something special happens when *machen* embeds an adjective. In terms of a decomposition along the lines of (28) (repeated below as (35)), we may therefore adapt Kratzer's proposal by saying that an adjectival complement of *machen* must itself head the TargetP so that *machen* itself must start out in Proc:

(35)   [Jan *Init* [the boots *Proc* [the boots *Target* ...

It then follows immediately that no TS-participle can include both *machen* and its adjectival complement, since once Proc has introduced reference to events, nothing can take that away, on our account, which does not posit any counterpart of Kratzer's TS-participle-forming stativizer. Similarly, we can emulate Kratzer's account of *leeren* 'empty' by saying that the roots

---

[6]Thanks to Klaus Abels and Berit Gehrke for sharing their native speaker's intuitions with us.

underlying these verbs become verbs, and so, need -*en* to abort further verbal projection, only when Proc is added. Then, *geleert* 'emptied' can be an RS-participle, but never a TS-participle. Only the corresponding adjective *leer* 'empty' can denote a target state.[7]

2.7. Interim conclusions

In this section, we have looked at ways of ensuring that a directional PP will not cooccur with a TS-participle. On the basis of the considerations brought to bear on this issue, it seems fair to conclude that the optimal account should combine Zwarts's semantics for directionals with a decompositional analysis of the VP similar to the one proposed by Ramchand (in press). However, precisely the adoption of Ramchand's analysis of the VP leads back to the second question raised by the Czech data: Why is it that verbs of induced motion need directionals rather than locatives whenever they are not used to form TS-participles? On the analysis of the VP that we adopted above, all forms of those verbs contain a TargetP, and, by assumption, that TargetP can contain a locative PP. So, why isn't that locative PP simply preserved as such when the TargetP is embedded under Proc and higher functional structure?

2.8. Why Czech?

Unlike Czech, some languages, e.g., German, retain directional PPs with TS-participles. If our account of Czech had been purely syntactic, taking the structural position of the DIR part of directional PP to be above the cut off point for TS-participles, as in (32), for example, we might have accommodated German by postulating that German allows DIR to appear deeper down in the verbal fseq. But there is also a semantic side to the issue. If directional PPs cannot modify state-denoting expressions, because states do not yield traces with a path-structure, then a directional PP shouldn't be able to combine with a TS-participle even if the syntax allowed it. To the extent that verb roots bring with them a specification of what their meanings will be at the different nodes Init, Proc and Target ('tagging' the corresponding syntactic features assigned to them in Ramchand's theory, for example), one could in principle say that German, unlike Czech, allows directional PPs to access lexical information so that they can apply to the process component of the meaning of a verb not raised to Proc. However, we would strongly prefer not to resort to this, since it would entail parameterizing what appears to be a fundamental principle in this framework, that lexical meaning is only made available to the computational system at

---

[7]Notice, incidentally, that 'deadjectival' verbs like *empty* or *open* seem to contradict Kratzer's claim that the class of verbs forming TS-participles coincides with the class of verbs which allow time adverbials to modify only the target state component of their meaning, as in *I'll open the window for two minutes*.

the appropriate nodes. So, at this point, we will have to remain agnostic as to why not every language is like Czech.[8]

3. Directionals instead of locatives

We have tried to make a case that combining Zwarts's (2005) account of directionals with a decompositional analysis of TS-participles provides the optimal account of the fact that (Czech) TS-participles do not support directional PPs. We must now confront the question why all other forms of verbs of induced motion require directional PPs rather than locatives. This part of our task will lead us to depart from Zwarts's analysis in certain crucial respects. From the point of view of the decompositional analysis endorsed above, the problem can be stated as follows: We concluded from (10) that a locative PP can modify a TargetP, so why cannot a locative PP attach to the TargetP prior to merger with Proc (and subsequent verbal functional structure) to yield all the forms of (6)–(8) with a locative PP illicitly replacing a directional one? Within the decompositional analysis we have been led to adopt, this might be seen as the counterpart to the ordering problem for directional modifiers in a Kratzer-like analysis of TS-participles.

3.1. Data II

As a prelude to proposing a formal account of the obligatory replacement of locatives by directionals in the data presented in §2.1, we want to show that the problem to be solved is more general and in fact arises independently of any specific assumptions about the relationship between TS-participles and the other members of the verbal paradigm. We want to focus on what happens when sentences like (36) are embedded under movement verbs and verbs of induced motion.

(36) a. Petr   přednáší   skladbu   [v
          $Petr_{NOM.SG.M}$ $lecture_{3.SG.PRES}$ $syntax_{ACC.SG.F}$ in
          Brně]^{LOC} /*[do Brna].^{DIR}
          $Brno_{LOC}$ / into $Brno_{GEN}$
          'Petr lectures on syntax in Brno'
      b. Zuza   přebaluje   Aničku   [v
          $Zuza_{NOM.SG.F}$ $re\text{-}diaper_{3.SG.PRES}$ $Anička_{ACC.SG.F}$ in
          koupelně]^{LOC} /*[do koupelny].^{DIR}
          $bathroom_{LOC}$ / into $bathroom_{ACC}$
          'Zuza changes Anička's diapers in the bathroom'

Unsurprisingly, only locative PPs may occur in (36). But when the verbs from (36) are embedded as infinitival forms as in (37), directional PPs

---

[8]As Karel Oliva insists, even some Czech speakers accept directional PPs with TS-participles. Whatever solution is found for German will be assumed to apply here too.

appear instead:

(37) a. Petr   jede   přednášet skladbu   *[v
        $Petr_{NOM.SG.M}$ $go_{3.SG.PRES}$ $lecture_{INF}$ $syntax_{ACC.SG.F}$ in
        Brně]^{LOC} /[do Brna].^{DIR}
        $Brno_{LOC}$ /into $Brno_{GEN}$
        'Petr goes to lecture on syntax in Brno'
     b. Zuza   nese   přebalit   Aničku   ??[v
        $Zuza_{NOM}$ $carry_{3.SG.PRES}$ $re\text{-}diaper_{INF}$ $Anička_{ACC}$ in
        koupelně]^{LOC} /[do koupelny].^{DIR}
        bathroom   /into bathroom
        'Zuza carries Anička to change her diapers in the bathroom'

Leaving aside the question why locative PPs should be disallowed in (37), one might of course assume that the directional PPs in (37) are licensed as adjuncts on the VPs headed by the higher verbs, assuming Zwarts's account of directionals. Since the higher verbs are movement verbs/verbs of induced motion, their traces yield paths intersectable with the paths coming from directional PPs. However, this would not lead to an understanding of the paradigm in (38), where two PPs occur:

(38) a. Karel   jede   přednášet [na universitu]^{DIR}
        $Karel_{NOM.SG.M}$ $go_{3.SG.PRES}$ $lecture_{INF}$ at $university_{ACC}$
        [do Florencie].^{DIR}
        into $Florence_{GEN}$
        'Karel goes to Florence to lecture at the university'
     b. Karel jede přednášet [na universitu]^{DIR} [ve Florencii].^{LOC}
     c. *Karel jede přednášet [na universitě]^{LOC} [do Florencie].^{DIR}
     d. ??Karel jede přednášet [na universitě]^{LOC} [ve Florencii].^{LOC}

In particular, the question arises why (38c) is ungrammatical, although it should be possible to analyze the directional *do Florencie* 'into Florence' as an adjunct on the matrix VP while taking the locative to modify the infinitive, as in the English *Charles goes to Florence to lecture at the university.* Notice also if the directional PPs had to be adjuncts on the movement verb, (38a) would correspond to the distinctly odd *??Charles goes to the university to Florence to lecture.*

In view of the ungrammaticality of (38c), we are led to assume that (Czech) directional PPs are in fact never adjuncts on VPs introducing movement verbs, contrary to Zwarts. Still, (38c) might be derivable if directional PPs can be the complements of verbs of motion, as in the analysis proposed by Ramchand (in press) and Son (2006), for example. But even without taking a stand here as to whether this option is generally available, we think the directionals in (37)–(38) could not be parsed in this fashion. The reason is that if branching is at most binary, taking the directional PP as a complement of the movement verb would force an analysis of the infinitival clause as an adjunct, akin to purpose clauses in English. But this is quite

clearly incorrect. For one thing, clitics climb out of the infinitival clause, as shown in (39):

(39)   Zuza   ji   nese   přebalit   ??[v

$Zuza_{NOM.SG.F}$ $her_{ACC.SG.F}$ $carry_{3.SG.PRES}$ $re\text{-}diaper_{INF}$ in

koupelně]^{LOC} /[do koupelny].^{DIR}

$bathroom_{LOC}$ /$into\ bathroom_{DIR}$

'Zuza carries her to change her diapers in the bathroom'

As a matter of fact, the sentences in (37)–(39) have properties reminiscent of restructuring contexts in other languages. Most strikingly, perhaps, the two obligatorily transitive verbs in (37b) and (39), i.e., *nést* 'carry' and *přebalit* 'change diapers on,' share a single object DP the same way the two verbs in (37a) share a single subject. This fact will ultimately be the key to a unified analysis of (37)–(39) and the data presented in §2.1.

We assume that 'restructuring' in (37)–(39) corresponds to a small infinitival structure being embedded under the verbs of motion. The two sentences in (37), for example, would roughly look like (40) and (41), treating *jet* 'go' as an unaccusative verb:

(40)

(41)
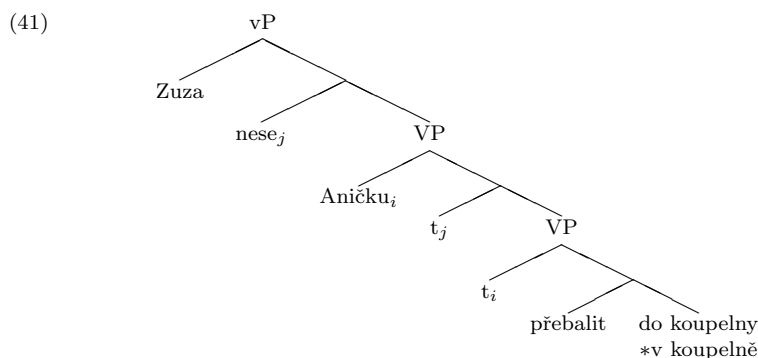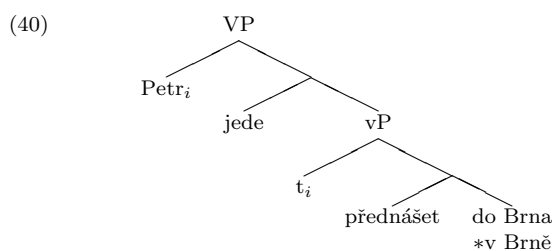
As in the cases discussed in §2.5, a single DP accumulates two thematic functions in each of (40) and (41). In fact, the parallelism assumed between the two sets of data is brought out even more transparently if we think of the labels vP and VP in (40)/(41) as equivalent with InitP and

ProcP, respectively. In any event, if the PPs in (37)–(39) must be inside the infinitival complement, as in (40)–(41), the fact that they must be directional rather than locative, has to be accounted for in a manner not foreseen by any standard account of spatial PPs. We claim that the proper account of (37)–(39) will also explain why the locative PPs occurring with TS-participles from verbs of induced motion must be replaced by directional PPs in all other verb forms, as shown in §2. To substantiate this claim, we will first go back to the data discussed in §2, and develop our account of the shift from locative to directional PPs observed in them. Then, we return to the class of data represented by (37)–(39) and show that our account generalizes.

The other context where the locative PP has to change into a directional PP is when a verb modified by a locative PP is embedded under *jít* 'go'.[9] The basic verb is shown in (42).

---

[9]And *dát* 'give'. Consider the sentence in (i)

(i) Eva suší košile [na šňůře]^{LOC} /*[na šňůru].^{DIR}
     $Eva_{NOM.SG.F}$ $dry_{3.SG.PRES}$ $shirt_{ACC.PL}$ on $line_{LOC}$ / onto $line_{ACC}$
     'Eva dries shirts on a line'

Embedding the verb *sušit* 'dry' under *dát* 'give' yields the sentences in (ii). The only difference between (iia) and (iib) is the locative PP and directional PP, respectively, but the interpretation difference is striking. While (iia) has the modal reading (parallel to (44)), the (iib) has a clear activity reading paraphrasable as 'put'.

(ii) a. Tahle hedvábná košile se dá sušit [na
         this silk $shirt_{NOM.SG.F}$ SE$_{ACC}$ $give^{IMP}_{3.SG.PRES}$ dry_{INF} on
         šňůře].^{LOC}
         $line_{LOC}$
         'It is possible to dry this silk shirt on a line'
      b. Tahle hedvábná košile se dá sušit [na
         this silk $shirt_{NOM.SG.F}$ SE$_{ACC}$ $give^{PF}_{3.SG.PRES}$ dry_{INF} on
         šňůru].^{DIR}
         $line_{LOC}$
         'This silk shirt will be put to dry on a line'

Again, the difference between the (iia) and (iib) is clearly structural. Consider the future tense morphology. *dát* in (iib) is perfective and as such (iib) expresses the future event. The *dát* in (iia), on the other hand, is imperfective and as such it has a compound future, as shown in (iii).

(iii) Tahle hedvábná košile se **bude** **dát** sušit na
      this silk $shirt_{NOM.SG.F}$ SE $AUX_{3.SG.FUT}$ $give_{INF}$ dry_{INF} on
      šňůře /*[na šňůru].^{DIR}
      $line_{LOC}$ / onto $line_{ACC}$
      'It will be possible to dry this silk shirt on a line'

(42) Karel fotografuje *[do parku]^{DIR} /[v
     Karel$_{NOM.SG.M}$ photograph$_{3.SG.PRES}$ into park$_{GEN}$ /in
     parku].^{LOC}
     park$_{LOC}$
     'Karel is taking pictures in the park'

When the verb *fotografovat* 'photograph' is embedded under the motion verb *jít* 'go', the locative PP from (42) shifts into a directional, as shown in (43).

(43) Karel půjde fotografovat [do parku].^{DIR}
     Karel$_{NOM.SG.M}$ po-go$_{3.SG}^{PF}$ photograph$_{INF}$ into park$_{GEN}$
     'Karel will go to take pictures in the park'

The locative PP is (almost) possible under the motion verb, too, as shown in (44). However, the expected activity reading *Karel will go to take pictures in the park* is not the only reading. The second reading is modal, with *Karel* being an object of photographing now.[10]

(44) Karel půjde fotografovat [v parku].^{LOC}
     Karel$_{NOM.SG.M}$ po-go$_{3.SG}^{PF}$ photograph$_{INF}$ in park$_{LOC}$
     1. ??'Karel will go to take pictures in the park'
     2. ?'It will be possible to take pictures of Karel in the park'

The verb *jít* has to have different structures in its modal and activity readings, otherwise the contrast between (43) and (44) remains unexplained.

3.2. Ramchand's proposal

According to Ramchand (in press), locative PPs do sometimes occur in TargetPs embedded under Proc. One of her examples is (45):
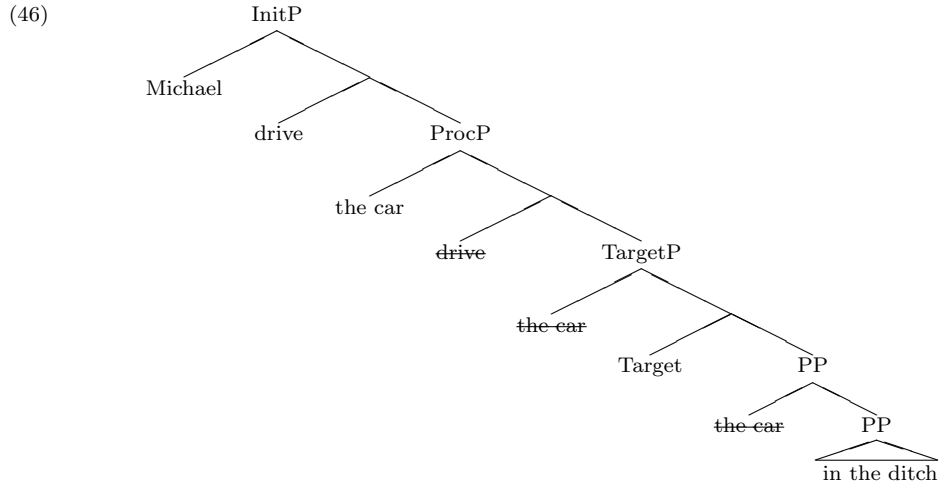
(45)   Michael drove the car in the ditch.   (Ramchand in press:44a)

She parses (45) as in (46), modulo our use of the label Target for her Res:[11]

---

[10] The modal reading of (44) is better when *Karel* appears in accusative, as shown in (i).

(i) Karla půjde fotografovat [v parku].^{LOC}
     Karel$_{ACC.SG.M}$ po-go$_{3.SG}^{PF}$ photograph$_{INF}$ in park$_{LOC}$
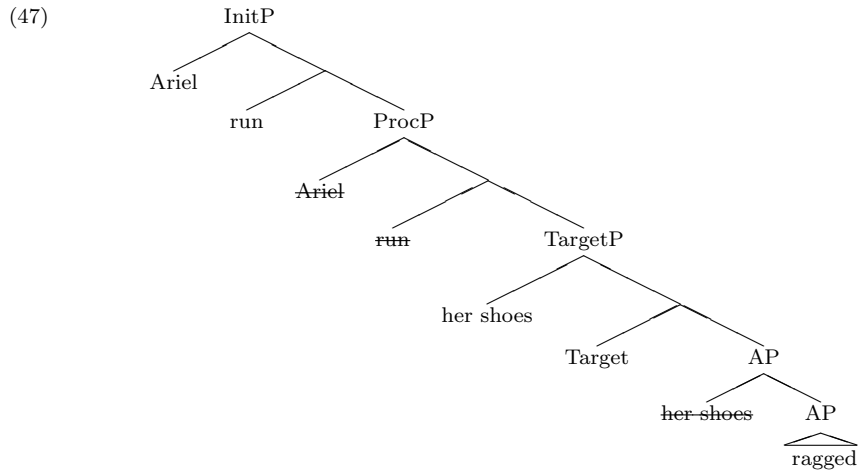   'It will be possible to take pictures of Karel in the park'

[11] This faithfully reproduces Ramchand's own representation, but in view of her generalization about locative PPs as complement of Res, she presumably intends the verb to lexicalize Target.

(46)

InitP
  Michael
    drive   ProcP
          the car
              drive   TargetP
                    the car
                        Target   PP
                              the car   PP
                                    in the ditch

In (46), the locative PP is a rheme complement of the head of the
target phrase containing a copy of the subject of the ProcP in its own
Spec-position. Then, she notes (Ramchand in press:79) "Given these rep-
resentations, the only mystery that remains is why locative PPs cannot
systematically exploit the Res head in English as in (49) above [here (47)]
to consistently give rise to locational result phrases with motion verbs ..."
This is precisely the problem we want to solve in this section (with the
added twist that we believe that not even (45) actually has a locative PP
in its TargetP, an issue we will return to below). Ramchand's (49), under-
lying *Ariel ran her shoes ragged*, is reproduced in (47):[12]

---

[12]Giving the AP a subject of its own seems slightly at odds with her claim that As,
unlike Ps, do not (project functional structure which may) project external arguments.

(47)

InitP
- Ariel
- run
  - ProcP
    - ~~Ariel~~
    - ~~run~~
      - TargetP
        - her shoes
          - Target
          - AP
            - ~~her shoes~~
            - AP
              - ragged

(Ramchand in press:49)

By assumption, the head of the TargetP of (47) is not lexicalized by the verb, but is an autonomous lexical item available in English, but, by stipulation, unable to take a PP complement.[13] Hence, a (locative) PP can modify the head of a TargetP, by occurring as its rheme complement, just in case Target is lexicalized by the verb. Otherwise, a PP must be introduced either as an adjunct on the ProcP or a rheme complement of Proc, and must then be directional (in order to introduce paths matching the traces of the events denoted by Proc). But this account would seem to predict that any verb which can form a TS-participle, which should be possible only if the verb can lexicalize Target, will license a locative PP in its TargetP. Since we have seen that verbs like *hodit* 'throw' and *pověsit* 'hang' can in fact form TS-participles, (10) tells us that this prediction is incorrect.

It should be stressed, at this point, that Ramchand does not commit herself to any specific view of the relationship between TS-participles and the ResP-level of the structures her theory postulates. Hence, the observation just made does not point to any inconsistency in her analysis, but simply shows that we cannot adopt her account of locative PPs in the context of our own use of her decompositional scheme.

On the other hand, we think that impossibility of introducing a locative PP in a TargetP embedded under Proc, is even more pervasive than Ramchand suggests. In particular, we find it striking that even though the Norwegian equivalent of (45) is also good with a *i* 'in' a purely locative preposition (as shown in (48)), adding a locative particle (in (49)) forces

---

[13]The claim is that Res must have the semantics of 'abstract possession.' It is hard to judge a priori whether a DP could enter into a relationship of 'abstract possession' with the sort of things a locative PP denotes.

a reading where the PP modifies the entire *driving*-event rather than its target state:

(48)   Michael kjørte bilen   **i**   grøften.
       Michael drove car-the in ditch.the
       'Michael drove the car in the ditch'

(49)   Michael kjørte bilen   **nede i**   grøften.
       Michael drove car-the down in ditch.the
       'Michael drove the car down in the ditch.'

In Norwegian, path-denoting particles like *ned* 'down,' *opp* 'up' and others are in general required to build directionals, but have locative counterparts formed by affixation of a final schwa, as in directional *ned* 'down' vs. locative *nede*. The fact that some verbs, like *kjøre* 'drive' or *ramle* 'fall', give rise to directional readings with locative PPs and may cooccur with a directional particle (subject to some degree of lexical variation), but lose the directional reading when the PP combines with a locative particle (as illustrated in (50)–(51)), suggests an analysis in which these verbs may themselves lexicalize the head otherwise lexicalized by a path-denoting directional particle:[14]

(50)   Michael ramlet (**ned**)   **i**   vannet.
       Michael fell   (down) in water.the
       'Michael fell down in the water'

(51)   Michael ramlet **nede i**   vannet.
       Michael fell   down in water-the
       'Michael fell down in the water.'

When *ned* is left out in (50), the verb lexicalizes the corresponding path-denoting head. Otherwise, *ned* does. But when this position is filled by *ned* rendered locative by affixation of *-e*, there is no source for a directional reading.[15]

3.3. An fseq account?

At first blush, it seems that a trivial solution is at hand to the extent that we could say that (Czech) verbs of induced motion select for the DIR

---

[14]It is striking that a Path lexicalized by the verb always seems to have the downward directionality of *ned* 'down,' as in (i):

(i)   Michael kjørte bilen   *(inn) i   garasjen.
       Michael drove car-the in   in garage.the
       'Michael drove the car into the garage'

[15]Notice also that the verb particles productively appearing with many verbs in Germanic are systematically directional rather than locative, e.g., they don't have a final schwa in Scandinavian, and in Dutch, they correspond to the particles that are obligatory ingredients of directional expressions; cf. den Dikken (to appear).

appearing in (32) (repeated below as (52)) in the sense that once the verbal projection has reached Proc, it must include DIR as well:

(52)   ... **DIR** [the boots *Proc* [**LOC** [the boots *Target* ...

Then, DIR, feeding on the LOC, would produce a directional PP, i.e., a locative PP would not appear in (6)–(8), because it is forced to 'grow' into a directional PP. However, in addition to the somewhat stipulative character of this response, there are serious problems with (52) itself. In particular, it is hard to work out the compositional semantics of DIR and LOC along the lines of Kracht's analysis, for example. Suppose, for example, we enable DIR and LOC to communicate by raising the locative PP to DIR, much as in recent work by Kayne, certain PPs are formed by lifting DPs to Ps merged on the verb's extended projection line, as in (53):

(53)   ... **DIR** [**LOC X** [the boots *Proc* [~~LOC~~ [the boots *Target* ...

To arrive at an implementation of Zwarts's basic ideas, we would want DIR to denote a set of paths, partially determined by LOC, and intersect that set with the traces of the events in the denotation of the ProcP. But the ProcP is not the sister of DIR in (53). If DIR is a modifier, it must be a modifier of XP. Another complication concerns the particular way the semantics of LOC must be recycled in (53). Within the TargetP, LOC should be a modifier of a state-denoting expression, but the raised copy needs to be simply a set of locations in order to interact with DIR as intended. Thus, the analysis requires the power to type-shift in a manner that doesn't appear restrained by any general principle.

3.4. A conceptual problem

Continuing to focus on the role of the locative PP within the TargetP, we discover a certain amount of tension between the decompositional analysis of verbs and Zwarts's semantics for directional PPs. If we adopt Zwarts's assumption that spatial PPs modify verbs, the TargetP embedded in (6) (repeated below as (54)) should look like (55):

(54)   Jan   hodil   boty   [do kouta]^{DIR} /*[v
         Jan$_{NOM.SG.M}$ throw$_{3.SG.PAST}$ boots$_{ACC.PL}$ into corner$_{GEN}$ / in
         koutě].^{LOC}
         corner$_{LOC}$
         'Jan threw boots into the corner'

(55)   ... [$_{TargetP}$ the boots [throw [in the corner]]]

The interpretation of (55) should support the entailment that as long as the target state holds, the boots are *in the corner*.

   On the other hand, the DP that identifies the holder of the target state, typically doubles as the subject of the ProcP, the *undergoer*, in the scheme

we took over from Ramchand (in press):

(56)   . . . [$_{ProcP}$ the boots [throw [$_{TargetP}$ the boots [throw [in the corner]]]]]

When the Proc head is 'named' by a verb of induced motion, the *undergoer* denotes the individual moving along the paths returned by the trace function τ applied to the events denoted by Proc. Given this, it seems that even if we could somehow (re)merge the locative with the DIR to form a constituent properly modifying the ProcP, adapting Zwarts's analysis to our decompositional analysis of the VP, the modifier created in this way would add no new information to the already existing structure.

Zwarts (2005:23) characterizes the semantics of *into the corner* as in (57) (adapting slightly):

(57) $[\![(into\ the\ corner)]\!]$ = {p: there is an interval I $\subset$ [0,1] that includes 1 and that consists of all the indices $i \in$ [0,1] for which $p(i)$ is inside the corner}   (Zwarts 2005:35)

Thus, *into the corner* denotes a set of paths all of the form shown in (58), where the plusses represent positions in the corner and the minuses positions outside it:

(58)   − − − − − − + + + + +
        0   1   (Zwarts 2005:34d)

Suppose now that *into the corner* modifies *threw the boots* in compliance with (59) (an adaptation of (19) to fit the syntax we are assuming, with VP corresponding to ProcP):

(59) $[\![PP\ VP]\!]$ = {e in $[\![VP]\!]$: $\tau(e)$ in $[\![PP]\!]$}

Zwarts assumes that the denotation of *threw the boots* is such that the trace function τ invoked in (59) will return paths like those in (60) in addition to paths patterning with (58):

(60)   a.   + + + + + + + + + + +
              0   1
        b.   − − − + + + − − − + + +
              0   1
        c.   + + + − − − − − − + + +
              0   1   (Zwarts 2005:34a-c)

So, *into the corner* has a job to do. (59) will use it to narrow down the denotation of the VP by throwing out all events with traces like those in (60). But on an analysis where the VP decomposes as a ProcP embedding a TargetP modified by *in the corner*, the denotation of the VP arguably will not contain paths with traces like those in (60) to begin with.

To see this, consider first the fact that since the events denoted by the ProcP are concatenations of the events denoted by *Proc* and the states denoted by the TargetP, any trace will have its final part in the corner (plusses) when the TargetP contains *in the corner*. The demonstration that the initial part must consist entirely of positions outside the corner (minuses) starts out from the fact that the *undergoer* is interpreted as moving along any path associated with an event denoted by Proc as the corresponding event unfolds over time. Without a correspondence between the run time of the event and the successive positions on the path associated with it under the trace function, (61) and (62) could in fact describe the same events (50)–(51):

(61)   Jan threw the boots into the corner.

(62)   Jan threw the boots out of the corner.

So, we can think of the paths in $\tau(e)$, where e is in the denotation of Proc, as being formed by extracting the third component l from each member of a sequence of triplets (i,t,l), where i is the individual denoted by the *undergoer*, t ranges over successive points of time in the run time of e, and l is a location.

Thus, if the events denoted by Proc have traces matching the path-structures in (60), there will be points of time during the run-time of those events at which the *undergoer* occupies locations within the same space in which the *resultee* is located when the target state holds. If the *undergoer* is identified with the *resultee*, as in (56), this also means that the target state already obtains at some non-final point in the run-time of the Proc subevent. But, crucially, Ramchand maintains that the run-time of the Proc subevent can only overlap the target state at its final point, reflecting the causative semantics linking the Proc subevent to the target state. Hence, it follows that quite independently of (59), the complex event formed by putting together a Proc subevent with a target state, can correspond to paths like (58), but not to paths like those in (60).[16] But then, modification by directional PPs in accordance with (59) is always vacuous when the TargetP contains the corresponding locative PP, and attempting an adaption

---

[16]To give formal expression to this intuition, we need to give the semantics for Proc as in (i) rather than as in (ii), which reproduces Ramchand's formalization (with *V* standing in for the denotation of the verb root):

(i) $\lambda P \lambda x \lambda e. \exists e', e'' \ (V(e') \ \& \ \theta(e',x) \ \& \ P(e'') \ \& \ e = e' + e'' \ \& \ \neg \ \exists e'''(e''' \leq e' \ \& \ P(e''')))$

(ii) $\lambda P \lambda x \lambda e. \exists e', e'' \ (V(e') \ \& \ \theta(e',x) \ \& \ e = e' + e'')$

where $\neg \exists e(e''' \leq e' \ \& \ P(e'''))$ replaces the requirement that e', the Proc subevent, overlaps e'', the target state, only on the last member of its trace. Notice that something similar seems called for even on Ramchand's analysis to the extent that VPs like *drive the car in the ditch*, e.g., in (49), exclusively yield paths like (58).

of Zwarts's analysis will just beg the question of why there are directional PPs in the structures under consideration.

Notice, on the other hand, that directional PPs with the adjunct-like syntax and intersective semantics assumed by Zwarts must still be assumed for NPs, as in *the road into town*. The fact that directional PPs must in any event be allowed to modify NPs essentially as suggested by Zwarts seems significant in view of the pivotal role of the *undergoer/resultee* DP in the argument leading up to the conclusion that Proc events must yield traces like (58) when the TargetP contains a spatial PP. The strategy we will pursue will in fact use locative and directional PPs essentially as D/NP modifiers to exploit the way the *undergoer/traveler* DP interacts with event-denoting heads.

3.5. Further into the tunnel

Moving towards an implementation of this strategy to explain why a locative PP doesn't survive embedding under Proc, we first turn to another problem we have to deal with in order to handle spatial PPs modifying the TargetP. Consider the range of interpretations available to (63):

(63)   Jan walked 2 meters further into the tunnel.

In addition to the readings brought out by continuations like *than he did yesterday* or *than the others*, we can understand (63) as describing the event of John walking from one location within the tunnel to another location two meters closer to its center. The latter reading is the only one available to the Norwegian sentence in (64):[17]

(64)   Jan gikk   2 meter videre inn i   tunnelen.
        Jan walked 2 meters further into the tunnel

On this reading, the location of the *undergoer* when the target state is reached, is determined relative to his position at the beginning of the whole event, coinciding, on our account, with the beginning of the subevent denoted by Proc. To the extent that that position can only be retrieved by accessing the traces of events denoted by Proc, the compositional semantics will encounter a problem when trying to evaluate the TargetP.

---

[17] *Videre* differs in this respect from *lenger*, literally 'longer'. With *lenger* substituted for *videre* (in (i)), (64) is compatible with the same range of interpretations as (63).

(i)   Jan gikk   2 meter lenger inn i   tunnelen.
       'Jan walked 2 meters longer in   the tunnel'

Possibly, this is related to the fact that only *lenger* looks like a true comparative:

(ii)   Jan gikk   2 meter lenger/*videre enn meg.
       John walked 2 meters longer   than me

Of course, one might claim that the initial position of the *undergoer* is supplied within the TargetP by a covert term of comparison corresponding to something like 'than he was before.' But whereas this may be plausible for (63) and its Norwegian counterpart with the *lenger* mentioned in footnote 17, it is not for (64), since *videre* in fact refuses to cooccur with a term of comparison, as shown in footnote 17.

Alternatively, one might attempt to find a way around this problem by having the semantics of *videre/further* impose the condition that the events causing the target state to obtain must have traces initiating at a location (a certain distance) less close to the midpoint of the space denoted by the PP than the location assigned to the *undergoer* in the target state, e.g., the TargetP of (64) might be represented as something like (65), with arbitrarily chosen *l*:

(65) $\lambda e.$ at(*e, Jan, l*) & .... & $\forall e'[cause(e',e) \longrightarrow \tau(e)$ initiates in the tunnel two meters further away from the center than *l*]

Since the subevent denoted by Proc is taken to bring about the target state, (56) would force it to have a trace initiating in the right location relative to the undergoer's location in the target state. But, on the other hand, the condition seems too strong. Suppose *Jan* walks two meters from *l* to *l′* in the tunnel. It would seem as if subparts of that walk measured from any point between *l* and *l′* should count as an event causing *Jan* to be at *l′* , and so, should make *cause(e′,e)* true while failing to satisfy the description following the arrow in (65). To the extent that there is no unique causing event for any given target state, it is of course useless to replace (65) with (66):

(66) $\lambda e.$ at(*e, Jan, l*) & .... & $\exists e'$ [cause(e′,e) $\longrightarrow \tau$(e) initiates in the tunnel two meters further away from the center than *l*]

Suppose, for instance, we are talking about a subevent of a walking event, as in (67):

(67) Jan passerte den store stenen og gikk   to   meter videre
      Jan passed   the big   rock-the and walked two meters further
      inn i tunnelen.
      into tunnel-the
      'Jan passed the big rock and walked two meters further into the tunnel'

(66) would allow (67) to be true even if *Jan* in fact only walked one meter past the big rock, since (67) clearly describes only a proper subpart of a larger event of continuous walking which could perfectly well have initiated two meters away from the endpoint. The point is that we are not interested in the initial location associated with just any causing event, but rather with the one the sentence is about, i.e., the one taken as the denotation of

Proc, but there seems to be no way of determining in advance which that is going to be. On the other hand, we note that the initial location associated with the trace of an event denoted by Proc is also the initial location of the *undergoer*. Since the DP denoting the *undergoer* is identical to the one denoting the 'holder of the target state,' i.e., the subject of the TargetP, this suggests that that DP might be used as a vehicle for comunication between the TargetP and Proc. We now proceed to developing this idea.

3.6. DPs and spatiotemporal traces

First, we focus on the role of the DP as the 'holder of the target state,' i.e., the subject of *TargetP*. We will assume that a DP, e.g., *Jan* or *the boots*, comes with a fragment of a 'trajectory' providing information locating the individual it denotes in space and time, represented as a list of pairs (t,l), where t is a point of time and l a location. Minimally, the subject of the TargetP given in (58) (repeated here as (68)) should be associated with a single pair (t,l):

(68) $\ldots[_{TargetP}$ the boots [throw- in the corner]]

The predication should come out true just in case l is contained in the space determined by *in the corner*.

A locative PP like the one in (68) can combine with a path-denoting expression, like *inn* in the Norwegian example in (64), repeated here as (69):

(69)   Jan gikk   2 meter videre **inn** i   tunnelen.
         Jan walked 2 meters further into the tunnel
         'Jan walked 2 meters further into the tunnel'

In general, such path-denoting elements are essential to the formation of directionals in Norwegian and many other languages. Thus, if *inn* is removed from (70), for example, the PP is locative in the sense that the whole walking must be located inside the tunnel, whereas *inn* imposes readings where the walker starts out from outside the tunnel:

(70)   Jan gikk   2 meter   (inn) i tunnelen
         Jan walked 2 meters into   tunnel-the
         'Jan walked 2 meters in(to) the tunnel'

However, path-denoting elements like *inn* 'in,' *ut* 'out,' *opp* 'up,' *ned* 'down' and some others, can also be used to build locative PPs provided either a final schwa is added or the path-denoting element forms a prosodic word with the following preposition,[18] as in (71), which like (70) without *inn*,

---

[18]Alongside the locative *inne i tunnelen*, for example, there is locative *inn i tunnelen* with *inn i* acting as a prosodic unit sharing a single word accent (as opposed to directional *inn i tunnelen* where *inn* and *i* maintain their prosodic autonomy). There are a number

entails that the whole walking event took place inside the tunnel:

(71)   Jan gikk   to meter inne i   tunnelen.
          Jan walked two meters inside the tunnel

It seems that the paths denoted by expressions like the *inne* of (71) identify the space denoted by the PP as consisting of the endpoints of paths with an orientation determined by the lexical content of the particle, e.g., *opp* vs. *ned*, and a contextually determined initial point, typically the location of the speaker.

So, the presence of paths among the ingredients from which a PP is formed does not per se distinguish directional from locative PPs, although, on the other hand, directionals generally require paths. We propose instead that whereas locatives associate the initial points of paths with a contextually determined location, directionals identify the initial point of paths with a location occupied by the individual denoted by the DP subject of the *TargetP* at a point of time prior to the initial point of time in the interval in which the target state obtains.

This proposal immediately allows us to make sense of the Norwegian examples in (72)–(73):

(72)   Jan er to   meter kortere inne i tunnelen (enn han var
          Jan is two meters shorter inside tunnel-the (than he   was
          før).
          before)
          'Jan is two meters shorter inside the tunnel than he was before'

(73)   Jan gikk   to   meter kortere inn i tunnelen (*enn han var
          Jan walked two meters shorter into tunnel-the (than he   was
          før).
          before)
          'Jan walked two meters shorter into the tunnel (*than he did before)'

In the locative (72), the starting point of the paths provided by *inn(e)* is identified with a contextually salient location, e.g., that of the speaker, not with the previous position of *Jan*. But in (73), a directional, the paths must initiate at the location held by *Jan* at the onset. On one reading, the one forced by the parenthesized material, *kortere* would relate that position to the endpoint of the path the same way *videre* does in (64). So, since *kortere* means 'shorter,' the endpoint should now be two meters less close to the midpoint of the tunnel than the initial location. But that contradicts the directionality inherent to *inn*, compatible only with paths pointing towards the center of the space defined by the locative PP.

of interesting differences between the two versions of the locative particles which will not be relevant here.

228

Notice, incidentally, that this brings out the necessity to assume a specific association between the spatial points on a path and the time points in the run-time of the event involving the *undergoer*. On a purely atemporal conception of paths, an *inn*-path would be defined as such by having each point closer to the center than any point preceding it. But to account for (73), we also need to exclude the possibility that the *undergoer* travels along an *inn*-path in reverse. This can only be achieved by requiring an order-preserving mapping of the points of the path onto the time points in the run-time of the event, i.e., the initial point of the path must map onto the initial point in the run-time etc. Such a mapping will in fact be built into the implementation we are about to propose.

3.7. Implementation

Slightly more precisely, we assume that a directional augments the PP in the TargetP shown in (68) as in (74), where DIR selects Path (path-denoting expressions like *inn*):

(74) $\dots$ [$_{TargetP}$ the boots [throw- [DIR [Path [in the corner]]]]]

Largely for convenience, we assume that locative PPs involve an element Loc, spelled as *-e* in Norwegian, when there is a (overt) path-denoting particle. In Czech, the locative *na* and *v* spell out LOC and Path, whereas directional *na* and *do* spell out DIR and Path. (We leave open exactly how Case-assignment to the landmark DP works, c.f. Caha this volume).

While LOC leaves the initial point of a path to be identified by context, DIR identifies it with the *l* of a (*t,l*) in the trajectory associated with its subject, with *t* preceding the first point of time at which the target state holds. At this stage of the derivation, corresponding to (74), then, the 'holder of the target state' is destined to become a *traveler* as well. Here's how it works: We assume, as before, that every DP is associated with a 'trajectory,' a continuous fragment of the course taken by an individual across time and space. For any individual *x*, we represent this as $\tau(x)$, a list of pairs (*t,l*) with *t* a time and *l* a location ordered by their first component according to the ordering of times. The PPs occurring inside TargetPs are taken as modifiers of the predicate of the *TargetP*. (65)–(66) give the semantics for DIR and LOC, respectively:

(75) $[\![DIR]\!] = \lambda P \lambda x \lambda e . \Theta(x,e) \ \& \ \exists p(P(p) \ \& \ \text{for the initial } (t,l) \in \tau(x),$
         $l = p(0) \ \& \ \exists t', l' \ ((t',l') \in \tau(x) \ \& \ t' \text{ is the initial point in } \tau(e) \ \& \ \forall t, l$
         $((t' < t \ \longrightarrow ((t,l) \in \tau(x) \ \longrightarrow \ l = p(1)))))))$

(76) $[\![LOC]\!] = \lambda P \ \lambda x \ \lambda e. \ \Theta(x,e) \ \& \ \exists p(P(p) \ \& \ \exists t', l' \ ((t',l') \in \tau(x) \ \&$
         $t' \text{ is the initial point in } \tau(e) \ \& \ \forall t, l \ ((t,l) \in \tau(x) \longrightarrow l = p(1))))$

We take Path to deliver the set of paths with endpoints in the space denoted by the PP. Having a directional PP impose a path-structure on individuals,

as in (75), is merely an extension of what happens in expressions like *the road into the forest* except that we are focusing on DPs formed from nouns which, unlike *road* or *path*, denote entities with no inherent spatial path structure except in conjunction with their progress across time. Combining the DirP of (75) ((6)) with the verbal head of the TargetP should yield something like (77):

(77) $\lambda x \, \lambda e.$ *throw(e)* & $\Theta(x, e)$ & $\exists p$ (*into the corner*(p) & for the initial (t,l) in $\tau(x)$, $l = p(0)$ & $\exists t', l' \, ((t',l') \in \tau(x)$ & t' is the initial point in $\tau(e)$ & $\forall \, t,l \, ((t' < t \longrightarrow ((t, l) \in \tau(x) \longrightarrow l = p(1)))))))$

This turns into (78), a predicate of events, just in case the (plural) individual denoted by *the boots* has a trajectory with a final segment with locations inside the corner and an initial (t,l) with l coinciding with the initial location on some path in the denotation of *into the corner*:

(78) $\lambda e.$ *throw(e)* & Θ(*the boots,e*) & $\exists p$ (*into the corner*(p) & for the initial (t,l) in τ(*the boots*), $l = p(0)$ & $\exists \, t',l' \, ((t',l') \in \tau$ (*the boots*) & t' is the initial point in $\tau(e)$ & $\forall \, t,l \, ((t' < t \longrightarrow ((t, l) \in \tau($*the boots*$) \longrightarrow l = p(1)))))))$

Correspondingly, (68), with LOC instead of DIR, ultimately gives (79) just in case all locations in the trajectory associated with *the boots* correspond to endpoints of paths going *into the corner*:

(79) $\lambda e.$ *throw(e)* Θ(*the boots, e*) & $\exists p$ (*into the corner*(p) & $\exists \, t',l'$ $((t',l') \in \tau(x)$ & t' is the initial point in $\tau(e))$ & $\forall t \, ((t,l) \in \tau($*the boots*$) \longrightarrow l = p(1)))$

As before, we also assume, following Ramchand (in press), that the DP subject of the TargetP also becomes the subject of the *ProcP*:
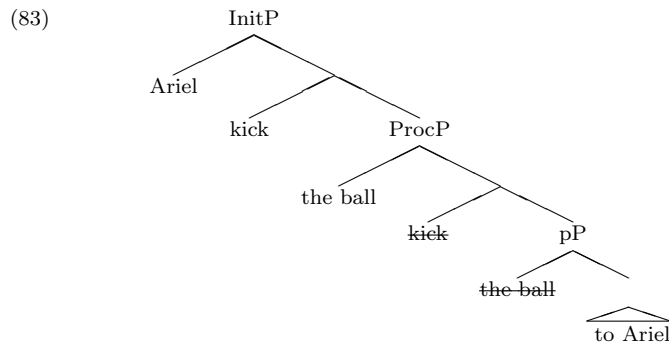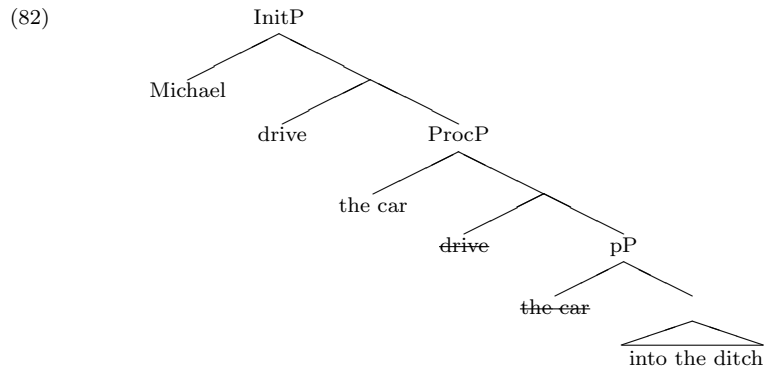
(80)   ... $[_{ProcP}$ the boots [throw- $[_{TargetP}$ the boots [throw- ...

As a consequence of this, we take it that an initial part of the trajectory associated with that DP must match the trace of an event in the denotation of the head of the ProcP. This is how the DP becomes a vehicle for communication between the predicate of the TargetP and the predicate of the ProcP, yielding interesting results which we will return to below. Those results also rest in part on the additional assumption in (81):

(81) t must be linked to a point of time in the run-time of an event for every (t,l) in the trajectory associated with a DP

The required 'linking,' effected through matching of a DP's trajectory against the run-time of an event, happens only when the DP is the subject of an event-denoting predicate. We regard (81) as a natural extension of (one half of) the θ-criterion to 'instances' of an individual across a trajec-

tory. Finally, we would like to note that our assumption that a DP (other than the path, a road etc.) can enter into a predication relation with a directional PP is replicated in Ramchand's account of sentences like *Michael drove the car into the ditch* or *Alex kicked the ball to Ariel*. She suggests that these are to be analyzed as in (82) and (83), respectively:

(82)

```
            InitP
          /      \
     Michael      \
              drive   ProcP
                     /     \
                the car     \
                          drive   pP
                                 /    \
                             the car   \
                                    into the ditch
```

(83)

```
            InitP
          /      \
      Ariel       \
               kick   ProcP
                     /     \
                the ball    \
                          kick   pP
                                /    \
                            the ball  \
                                    to Ariel
```

Presumably, the predication relation internal to the pP identifies the DP as a *traveler* with respect to paths in the denotation of directional PP.[19]

3.8. Further into the tunnel again

We assume that the *two meters further* of (63) (repeated here as (84)) and the *to meter videre* of (64) (repeated here as (85)) modify a path-denoting expression:

(84)   Jan walked two meters further into the tunnel.

---

[19]Since the pP as whole must be taken as a rheme complement of Proc restricting the denotation of the latter to events whose traces match its paths, the pP should presumably translate as a property of eventualities, which would make it a candidate for describing the caused eventuality (the target eventuality) encoded in the meaning of Proc. In fact, this combinatorial possibility can only be excluded by restricting causation to the relation between the syntactic categories Proc and TargetP (ResP).

(85)   Jan gikk   two meter videre inn i   tunnelen.
        Jan walked two meters further into the tunnel

In particular, on the reading of (84) which has Jan walking from some point inside the tunnel to another point two meters closer to the tunnel's midpoint, the only reading available to (85), *two meters further/two meter videre* selects from the denotation of *into the tunnel* those paths contained in the tunnel whose endpoints are two meters closer to the center than the starting point. Since DIR, whose presence is reflected by *-to* in (84) and the absence of a final schwa on *inn* in (85), requires Jan, the subject of the TargetP, to have a trajectory whose initial (t,l) has l equal to the initial point of a path denoted by *two meters further into the tunnel*, and since *Jan* is also the subject of the ProcP so that the first element in the trace of any event in the denotation of Proc must match the initial (t,l) of the trajectory of Jan, it follows that Proc can only denote events that initiate two meters further away from the midpoint of the tunnel than the endpoint. Thus, our system effortlessly succeeds in imposing the relevant restriction on the events in the denotation of Proc rather than on any causing events there might be.

As for (73) (repeated here as (86)), the path-denoting expression is modified by *to meter kortere* 'two meters shorter:'

(86)   Jan gikk   to   meter kortere inn i tunnelen   (*enn han var
        Jan walked two meters shorter into tunnel-the (than he   was
        før).
        before)
        'Jan walked two meters shorter into the tunnel (*than he did before)'

On the reading forced by inclusion of the parenthesized material, *to meter kortere* would pick up those paths in the denotation of *inn i tunnelen* which have their endpoint two meters further away from the midpoint of the tunnel than the starting point. But *inn* enforces orientation towards the center of the reference space, and so, no path in the denotation of *inn i tunnelen* has an endpoint further away from the center than the starting point.

3.9. Why directional PPs are incompatible with TS-participles

We started out from the observation that Czech TS-participles reject modification by directional PPs in (10) (the relevant part of this example is repeated here as (87)):

(87)   a.   Boty sou *ještě pořád* **hozený**   *[do   kouta]^{DIR} /[v
              boots are still   *thrown$_{LF}$ into corner$_{GEN}$ /in*
              koutě]^{LOC} (*Janem)
              corner$_{LOC}$ (Jan$_{INSTR}$)
              The boots are still thrown in the corner.
        b.   Kabát je *ještě pořád* **pověšenej**   *[na   věšák]^{DIR} /[na
              coat   is still   *hung$_{LF.SG.M}$ onto hanger$_{ACC}$ /on*
              věšáku]^{LOC} (*Ivonou)
              hanger$_{LOC}$ Ivona$_{INSTR}$
              The coat is still hanging on a hanger.

In §2.5, we suggested that directional PPs are impossible in (87), because TS-participles, lacking the *Proc*-level of structure, are stative and therefore not modifiable by directionals invested with the kind of semantics Zwarts (2005) attributes to them. However, the account proposed in §3.7 leads directly to an alternative explanation. The ungrammatical versions of (87a) and (87b) would look like (88):

(88)   a.   ... [$_{TargetP}$ the boots [throw- [DIR [Path [in the corner]]]]
        b.   ... [$_{TargetP}$ the coat [hang [DIR [Path [on the hanger]]]]

If the semantics of DIR is as in (75) (repeated below as (89)), predicates like (77) (repeated below as (90)) emerge which require the initial (t,l) of their subject's trajectory to have l identical to the initial position on a path introduced by Path:

(89) $[\![DIR]\!] = \lambda P \; \lambda x \; \lambda e. \; \Theta(x,e) \; \& \; \exists p(P(p) \; \& \; \text{for the initial } (t,l) \text{ in}$
        $\tau(x), \; l = p(0) \; \& \; \exists t', l' \; ((t', l') \in \tau(x) \; \& \; t' \text{ is the initial point in } \tau(e)$
        $\& \; \forall t, l \; ((\; t' < t \longrightarrow ((t, l) \in \tau(x) \longrightarrow l = p(1))))))$

(90) $\lambda x \; \lambda e. \; \text{throw}(e) \; \& \; \Theta(x,e) \; \& \; \exists p \; (\text{into the corner}(p) \; \& \; \text{for the initial}$
        $(t,l) \text{ in } \tau(x), \; l = p(0) \; \& \; \exists t', l' \; ((t',l') \in \tau(x) \; \& \; t' \text{ is the initial point}$
        $\text{in } \tau(e) \; \& \; \forall \; t,l \; ((t' < t \longrightarrow ((t, l) \in \tau(x) \longrightarrow l = p(1))))))$

Notice now that the t of this initial (t,l) must precede the first point of time at which the target state obtains, whenever l is outside the area determined by *in the corner/on the hanger*. If so, this particular t does not satisfy (81) (repeated here as (91) by being linked to a point in the time span covered by the target state:

(91) t must be linked to a point of time in the run-time of an event for
        every (t,l) in the trajectory associated with a DP

Since TS-participles have no Proc on top of the TargetP, (91) also cannot be satisfied by promotion of the DP to subject of ProcP, which, by earlier assumption would link the initial t in the DP's trajectory to the initial point in the run-time of an event in the denotation of Proc. From our point of view, then, if DIR always forces the subject of the TargetP to have the

initial (t,l) of its trajectory with l outside the space denoted by the PP, the ungrammatical versions of (87a) and (87b) are essentially θ-criterion violations.

Of course, (89) will guarantee that the l of the first (t,l) of the trajectory associated with the subject of the TargetP is outside the space defined by the PP if Path always returns paths with initial parts outside the space denoted by the PP it combines with, as, for example, in Zwarts's account of directional *in(to)*. This in turn appears to be a harmless assumption, since we do not distnguish directionals from locatives, like *inne i tunnelen* in (71) (repeated below as (92)) in terms of the properties of the paths used to form them, but rather on the basis of whether the initial points of these paths are 'anchored' in the trajectory of a *traveler* DP (directionals) or not (locatives):

(92) Jan gikk   two meter inne i tunnelen.
      Jan walked two meters in   in tunnel-the
      'Jan walked two meters inside the tunnel'

3.10. Why RS-participles require a directional PP

We have also seen that Czech verbs of induced motion require a directional rather than a locative PP when they do not take the form of a TS-participle:

(93) a. Jan hodil   boty [do kouta]^{DIR} /*[v koutě].^{LOC}
          Jan throw$_{3.SG.PAST}$ boots into corner$_{GEN}$ / in corner$_{LOC}$
          'Jan threw boots into the corner'
      b. Ivona pověsila   kabát [na věšák]^{DIR} /*[na
          Ivona hung$_{3.SG.PAST.F}$ coat   onto hanger$_{ACC}$ / on
          věšáku].^{LOC}
          hanger$_{LOC}$
          'Ivona hung a coat to a hanger'

(94) a. Boty   byly   **hozeny**   [do kouta]^{DIR} /*[v
          boots$_{NOM.PL}$ were$_{3.PL}$ thrown$_{SF.PL}$ into corner$_{GEN}$ / in
          koutě]^{LOC} (Janem).
          corner$_{LOC}$ Jan$_{INSTR}$
          'The boots were thrown into corner by Jan'
      b. Kabát   byl   **pověšen** [na věšák]^{DIR}
          coat$_{NOM.SG.M}$ was$_{3.SG.M}$ hung$_{SF.SG.M}$ onto hanger$_{ACC}$
          /*[na věšáku]^{LOC} (Ivonou)
          / *on hanger$_{LOC}$ Ivona$_{INSTR}$*
          'The coat was hung onto a hanger by Ivona'

Much of the preceding discussion was motivated by the desire to understand why the locatives are bad in (6)–(7). The system described in §3.7 provides an account. According to the syntactic analysis we have adopted, all forms of a verb of induced motion except the TS-participle project up

to at least the level of the ProcP. So, it seems that something goes wrong when Loc ooccurs instead of DIR on top of Path in configurations like (95).

(95)   ... [$_{ProcP}$ the boots [throw- [$_{TargetP}$ the boots [throw- [Loc [Path [in the corner]]]]

As a matter of fact, the proposal made in §3.7 already tells us what is wrong: By the semantics assumed for Loc, we get (79) (repeated here as (96)) as the representation of the TargetP:

(96) $\lambda e.\ throw(e)\,\Theta(the\ boots,\ e)$ & $\exists p\ (into\ the\ corner(p)$ & $\exists\ t',l'\ ((t',l')$ $\in \tau(x)$ & t' is the initial point in $\tau(e))$ & $\forall t\ ((t,l) \in \tau(the\ boots)$ $\longrightarrow l = p(1)))$

In particular, (96) forces anything denoted by the DP *the boots* to have l inside the corner for every (t,l) in its trajectory. But since *the boots* also identifies the subject of the ProcP, and, by previous assumption, the initial part of the trajectory associated with the subject of the *ProcP* must match the trace of an event in the denotation of *Proc*, it then follows that the individual denoted by the boots must be in the corner throughout the runtime of some event in the denotation of Proc. However, as already pointed out in §§2.1 and 3.4, we assume that any event in the denotation of Proc must be interpretable as causing (or 'leading up to') the target state. Minimally, this should entail that the target state cannot hold throughout the runtime of an event denoted by Proc. But in the case of (95), as we have just seen, the runtime of any event originating from Proc must in fact be included in a time interval in which the target state holds, since the boots will be in the corner at all points.
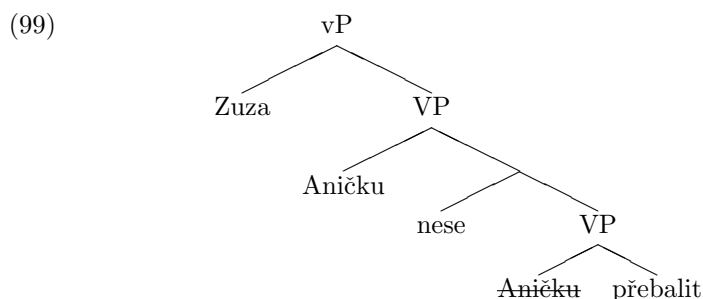
3.11. Unexpected DIR again

The proposal we just developed extends — as is desirable — to the cases of unexpected DIR replacing LOC discussed in §3.1. Whereas only a LOC PP is possible with a verb like *přebalit* 'change diapers' as shown in (97), a DIR becomes possible, in fact strongly preferred once *přebalit* is embedded under a verb of motion. In §3.1 we showed that the DIR is still likely to be part of the embedded INF clause in (98).

(97)   Zuza   přebaluje   Aničku   [v
         $Zuza_{NOM.SG.F}$ $re\text{-}diaper_{3.SG.PRES}$ $Anička_{ACC.SG.F}$ in
         koupelně]^{LOC} /*[do koupelny].^{DIR}
         $bathroom_{LOC}$ / $into\ bathroom_{ACC}$
         'Zuza changes Anička's diapers in the bathroom'

(98) Zuza   *nese*   přebalit   Anička   ??[v
     Zuza$_{NOM}$ carry$_{3.SG.PRES}$ re-diaper$_{INF}$ Anička$_{ACC}$ in
     koupelně]^{LOC} /[do koupelny].^{DIR}
     bathroom   /into bathroom
     'Zuza carries Anička to change her diapers in the bathroom'

The reason a DIR is impossible in the simple examples (97) is, according to our analysis, that a DIR would require the object DP to have a trajectory that cannot match the trace of the verb *přebalit*, which is not a motion verb. In (98) we assume that we are dealing with a restructuring context, i.e., a projection of the main verb including only the internal argument *Anička* is embedded directly under the motion verb, as shown in (99).

(99)

```
                        vP
                      /    \
                  Zuza      VP
                          /    \
                     Aničku     VP
                              /    \
                           nese     VP
                                  /    \
                            A̶n̶i̶č̶k̶u̶   přebalit
```

Crucially, the internal argument of the embedded verb *Anička* raises to become the *undergoer/traveler* argument of the higher motion verb, mapping its trajectory onto the trace of the event introduced by the motion verb.

4. Conclusion

Our goal has been to account for the alternation between directional and locative PPs exemplified by the Czech paradigm (6)–(10), i.e., we have tried to answer two questions: Why are directional PPs reluctant to combine with TS-participles? Why do verbs of induced motion require a directional rather than a locative PP when they do not occur as TS-participles? In the first part of the article, we found that the optimal way of answering the first question presupposed a decomposition of verbs of the kind recently advocated by Ramchand (in press). In the second part, we investigated the consequences of adopting this decompositional analysis with respect to the range of possible answers to the second question. In particular, the desire to maintain a strictly compositional semantics led to an analysis where directional PPs impose conditions on 'trajectories' associated with the subject of TargetP. Because in general, a single DP identifies both the subject of the TargetP and the subject of ProcP, this gave us the results we wanted. Thus, somewhat surprisingly, it turned out that our study of

spatial PPs led us to new claims about VPs and DPs, lending support to Ramchand's decompositional analysis of event-denoting VP-structure and also to certain assumptions of the interaction between DPs and event-denoting verbal structure.

References

Baker, Mark C. 2003. *Lexical Categories. Verbs, Nouns and Adjectives*. Cambridge University Press.

Caha, Pavel. 2006. Where's dative? Class presentation: Nanosyntax lab, CASTL, University of Tromsø.

Caha, Pavel. this volume. Case movement in PPs. In *Tromsø Working Papers on Language and Linguistics: Nordlyd 34.2,* Special issue on Space and Scalar Structure, edited by Monika Bašić, Marina Pantcheva, Minjeong Son, and Peter Svenonius, pp. 239–229. University of Tromsø, Tromsø. CASTL, Tromsø. Available at http://www.ub.uit.no/baser/nordlyd/.

den Dikken, Marcel. to appear. On the functional structure of locative and directional PPs. In *The Cartography of Syntactic Structure, vol. 6*, edited by Guglielmo Cinque and Luigi Rizzi. Oxford University Press, New York.

Kracht, Marcus. 2002. On the semantics of locatives. *Linguistics and Philosophy* 25: 157–232.

Kratzer, Angelika. 2000. Building statives. In *Proceedings of the 26th Berkeley Linguistic Society*, edited by Lisa J. Conathan, Jeff Good, Darya Kavitskaya, Alyssa B. Wulf, , and Alan C. L. Yu, pp. 385–399. BLS, Berkeley, Ca.

Lieber, Rochelle. 1980. *On the organization of the Lexicon*. Ph.D. thesis, MIT.

Ramchand, Gillian. in press. Verb Meaning and the Lexicon: A First Phase Syntax. Cambridge University Press.

van Riemsdijk, Henk and Riny Huybregts. 2002. Location and locality. In *Progress in Grammar: Articles at the 20th Anniversary of the Comparison of Grammatical Models Group in Tilburg*, edited by Marc van Oostendorp and Elena Anagnostopoulou, pp. 1–23. Meertens Instituut, Amsterdam. www.meertens.knaw.nl/books/progressingrammar/.

Son, Minjeong. 2006. Directed Motion and Non-Predicative Path P in Korean. In *Tromsø Working Papers in Language and Linguistics: Nordlyd 33.2, Special Issue on Adpositions*, edited by Peter Svenonius. University of Tromsø, Tromsø. Available at http://www.ub.uit.no/baser/nordlyd/.

Veselovská, Ludmila and Petr Karlík. 2004. Analytic Passives in Czech. *Zeitschrift fur Slavistik* 49 2: 163–243.

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