

# Bulgarian Spatial Prefixes and Event Structure

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## Abstract

In this paper, I explore the combination possibilities of Bulgarian directional prefixes with various motion verbs. Adopting Ramchand's (in press) event decomposition, Zwarts' (2005) vector space semantics for directional prepositions, and drawing on various discussions regarding the MANNER component in the verbal meaning, I propose an analysis that captures the distribution of Goal and Source prefixes. I show how this proposal accounts for the change in the syntactic behavior of prefixed motion verbs compared to their unprefixed counterparts. The proposal also explains the syntactic properties exhibited by verbs when prefixed by different prefixes. I offer a unified treatment of path structure and event structure and suggest that directional prepositions and directional prefixes are semantically identical and originate in the extended PP. The differences between them are due to the syntactic structure in which they participate.

## 1. Introduction

Bulgarian, like all Slavic languages, has a rich inventory of superlexical and lexical prefixes.<sup>1</sup> As argued for in Svenonius (2004a), lexical prefixes have core spatial meanings and attach to verbs of motion to build new predicates. For example, the Bulgarian motion verb *ticham* 'to run' can combine with the Source-directional prefix *iz* 'from,' as well as with the Goal-directional prefix *do* 'to.'

- (1) a. *ticham*  
*run* 'to run'
- b. *iz-ticham*  
*from-run* 'to run out of somewhere'
- c. *do-ticham*  
*to-run* 'to run to somewhere'

What is surprising, however, is that not all Bulgarian verbs of motion are equally happy with Goal and Source prefixes. Consider the following

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\* I am grateful to Peter Svenonius for his advice, suggestions and leading me throughout my work. I also thank Pavel Caha, Monika Bašić and Minjeong Son for their comments on earlier drafts of this work.

<sup>1</sup>For the distinction between superlexical and lexical prefixes see Svenonius (2004b) and Romanova (2004), among others.

example, where the verb *skacham* ‘to jump’ allows a Source-directional prefix but disallows a Goal-directional one.

- (2) a. *skacham*  
       *jump*           ‘to jump’  
       b. *iz-skacham*  
           *from-jump*   ‘to jump out of somewhere’  
       c. \**do-skacham*  
           *to-jump*     ‘to jump to somewhere’

The contrast between the verb *run* in (1) and *jump* in (2) becomes even more intriguing given that both verbs can take a Goal prepositional phrase.

- (3) *tichaj*        *do dǎrvoto!*  
       *run.IMPER to tree.DEF*  
       ‘Run to the tree!’  
       (4) *skochi*        *do dǎrvoto!*  
           *jump.IMPER to tree.DEF*  
           ‘Jump to the tree!’

An appropriate analysis of these facts should be able to explain in what way the verb *jump* is different from the verb *run* so that, although they both can take Goal-directional PPs, only the latter allows a Goal-directional prefix. It is the aim of this paper to present an account for the facts in (5).

- (5) Combination of motion verbs and the prefixes *iz* ‘from’ and *do* ‘to’ in Bulgarian  
       a. Some motion verbs allow only the Goal-directional prefix *do*.  
       b. Some motion verbs allow only the Source-directional prefix *iz*.  
       c. Some motion verbs allow both the Goal *do* and the Source-directional prefix *iz*.  
       d. Some motion verbs allow neither Goal-directional *do* nor Source-directional prefix *iz*.

In §2, I start by summarizing Ramchand’s (in press) verbal decomposition into *initP*, *procP* and *resP*. I present a classification of Bulgarian verbs of motion according to their subeventual structure and investigate the combination possibilities of the Goal and Source-directional prefixes in (5) with the verbs of each class. In §3, I briefly lay out Zwarts’ (2005) vector space semantics for directional prepositions with the final aim of drawing a parallel between verbal structure and path decomposition. The analysis I suggest is presented in §4 and relies on the semantic identity of prefixes and preposition, on the one hand, and the analogy between the structure of the VP and the decomposition of paths, on the other. More specifically, I claim that the *init* head and Source prefixes/prepositions encode the starting point of events and paths, respectively. Likewise, the *res* head and Goal

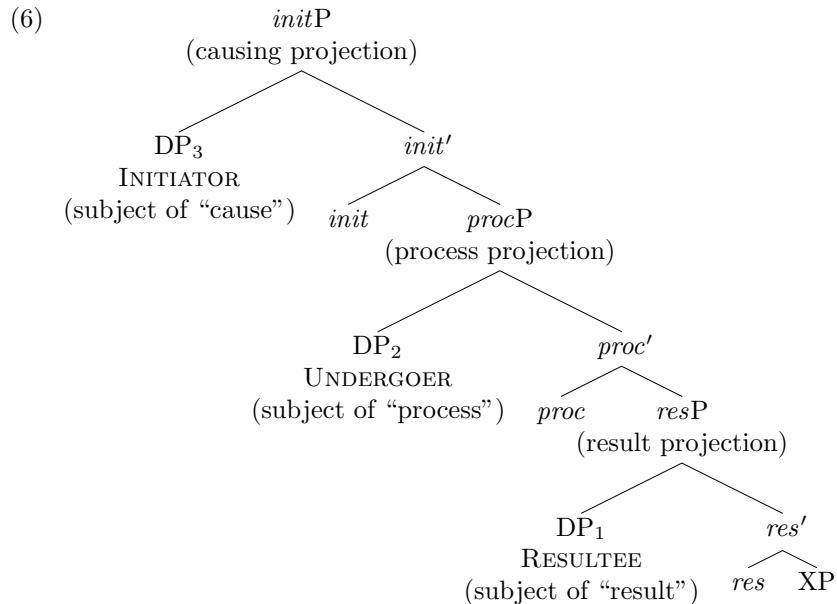
prefixes/prepositions define the endpoint of events and paths, respectively. The proposal is that a verb of motion can be prefixed only by a prefix which does not instantiate a subeventual head already identified by the verb itself. In the following §5, I discuss the MANNER component in the motion verb semantics and include it in the condition for prefixation argued for in the previous section. I reformulate the prefixation rule in order to account for those manner of motion verbs that otherwise constitute a counterexample. I discuss some implications of my proposal for the Goal-Source asymmetry (Filip 2003) in §6. There, I also show how this analysis of prefixation can provide an explanation for why prefixed motion verbs behave differently compared to their unprefixed counterparts, and also how we can account for the different properties of verbs with a Source prefix compared to the same verbs with a Goal prefix. §7 concludes the paper.

## 2. Verb classes

### 2.1. Ramchand's verb decomposition

In what follows, I will adopt Ramchand's (in press) decomposition of the VP into three distinct heads, each corresponding to a primitive element of events. The internal structure of the verbal domain is formed of three subeventual projections: *initP*, *procP*, and *resP*. Of the three, the *proc* head is the one always present in the decomposition of dynamic verbs, while *init* and *res* can be missing. Each subeventual head enters in a predicational relation with the specifier position. Thus, specifier positions host the thematic participants in the particular subevent, or the "subject" of the subevent. The semantics of the VP is fairly simple in that the system employs compositional semantic rules which interpret the embedded predication via a causational semantics.

The maximal decomposition of the verb phrase is presented below:



Thus, the three core projections are:

- InitP: introduces the causation event and licenses the external argument (the INITIATOR)
- ProcP: specifies the process or the nature of the change and licenses the internal argument (the UNDERGOER)
- ResP: introduces the result state and licenses the holder of the result state (the RESULTEE)

A verb can instantiate different subevents and, depending on which ones it actually identifies, it belongs to a particular verb class. In this model, verbs come with a categorial feature specification which determines which heads they lexicalize. It is important to note that, since a verb can have more than one category feature, it is multiply associated to different syntactic heads within the verbal phase. Similarly, a DP argument of a verb can occupy more than one specifier position, which results in *composite* thematic roles. The advantage of this system is that it allows for many different types of verbs to be put together by means of a fairly impoverished set of primitives and some general principles of lexical association. That is, many lexical verb types can be defined depending on which subeventual heads the verb lexicalizes and also which thematic participant the verb has.

To illustrate with a more concrete example, according to Ramchand (in press), *unergative* verbs are the ones which identify the *init* head and

have a single argument with the thematic role INITIATOR-UNDERGOER.<sup>2</sup> *Unaccusative* verbs, on the contrary, always lack *init* and therefore have no DP argument that carries the role of INITIATOR.<sup>3</sup> In this system, unaccusatives can be augmented via a null *init* head thus giving rise to causative-inchoative pairs like *break-break* in the following example.

- (7) a. The window broke.  
b. John broke the window.

In (7a), the verb *break* instantiates the heads *proc* and *res* and forms a predicate with a sole DP argument UNDERGOER-RESULTEE. Once we augment the structure by adding the null *init* head, available in English, we get the causative [*init*, *proc*, *res*] verb *break* in (7b), which has two arguments: an INITIATOR (*John*, i.e., the causer of the event) and the UNDERGOER-RESULTEE (*the window*). Adding a null *init* head in the verbal projection is possible only if the verb does not identify *init* itself. This is why verbs that do lexicalize *init*, like *run* and *dance*, cannot “causativize.”

Thus, we can take the availability of a causative-inchoative alternation to be a diagnostic for the lack of *init* in the lexical specification of verbs in English. In Bulgarian, however, this test cannot be applied because of the lack of a causative-inchoative alternation. Instead, I make use of the unaccusativity test used by Romanova (2006) for Russian, based on the availability of the superlexical cumulative prefix *na* for verbs that do not instantiate *init* (i.e., unaccusatives). Unergative verbs, on the contrary, do not take cumulative *na*. Thus, the unaccusative verb *padam* ‘to fall’ in (8a) allows *na*-prefixation, therefore it has no *init* feature, while the unergative *ticham* ‘to run’ in (8b) is ungrammatical with cumulative *na* and hence it is specified for *init*.<sup>4</sup>

- (8) a. Na-padaha mnogo shisharki.  
CUM-*fell* many cones  
‘Lots of cones fell’  
b. \*Na-tichaha mnogo hora.  
CUM-*ran* many people  
‘(Many people ran)’

If we want to have the full feature specification of Bulgarian motion verbs, we will also need a diagnostic for the lowest subevent in the verbal decom-

<sup>2</sup>As the *process* head is the hallmark of the dynamic event, unergative verbs will identify also *proc*.

<sup>3</sup>It has to be noted that, in this system, the label *unaccusative* applies to a different set of verbs than what is understood under the “traditional” term *unaccusative verbs*. According to Ramchand, the verb *arrive* then is **not** an unaccusative verb since it instantiates *init*.

<sup>4</sup>Abbreviations used in glosses are as follows: 1,2,3, - first, second and third person, ACC - accusative case, AUX - auxiliary, COMP - complementizer, CUM - cumulative prefix, DAT - dative case, DEF - definite, FUT - future, GEN - genitive case, IMPER - imperative, PL - plural, S - singular, SI - secondary imperfective.

position, namely the *res* head. One of the diagnostics for a *res* feature in the lexical specification of motion verbs proposed by Ramchand (in press) is based on the interpretation of spatial prepositional phrases. When a *res* verb of motion takes a locative PP, the latter can receive a goal-directional interpretation (see (9a)). If the verb has no *res* feature, the interpretation of the PP remains one of stative location (see (9b)).

- (9) a. Mary jumped in the ditch. (dir/loc)  
 b. Mary ran in the ditch. (locative only)

The same contrast can be observed with Bulgarian motion verbs. Thus, certain verbs license a goal-directional reading for a spatial PP, whereas other verbs allow only for a locative interpretation of spatial PPs. Therefore, I think that it is legitimate to adopt the same test for testing the presence of *res* in Bulgarian motion verbs. Thus, whenever a verb gives rise to a goal-directional reading of a locative PP, the verb will be specified for *res*, and whenever the verb disallows a goal of motion interpretation with a PP, the verbs will lack *res*. This is exemplified in the sentences below.

- (10) Motion verbs with *res*
- a. Vidyah go da pada v dupkata.  
*saw.1S him COMP falls in hole.DEF*  
 ‘I saw him fall into the hole’ (dir/\*loc)
- b. Vidyah go da se myata na masata.  
*saw.1S him COMP REFL throws on table.DEF*  
 ‘I saw him throw himself on(to) the table’ (dir/?loc)
- c. Vidyah go da kara kolata v garaja.  
*saw.1S him COMP drive car.DEF in garage*  
 ‘I saw him drive the car in(to) the garage’ (dir/loc)
- (11) Motion verbs with no *res*
- a. Vidyah go da tancuva v stayata.  
*saw.1S him COMP dances in room.DEF*  
 ‘I saw him dance in the room’ (loc/\*dir)
- b. Vidyah go da se tøkalya v garaja.  
*saw.1S him COMP REFL roll in garage.DEF*  
 ‘I saw him roll in the garage’ (loc/?\*dir)

To summarize, throughout this paper, I will be applying the cumulative *na* test and the directed motion reading test in order to determine the presence of *init* and *res*, respectively, in the lexical specification of Bulgarian motion verbs.

## 2.2. Motion verb classes and directional prefixes

Equipped with the *init* and *res* diagnostics presented in §2.1, we can now turn to individual motion verbs and determine their feature specification.

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Since the *proc* head is the hallmark of dynamicity and therefore present in every non-stative verb, it will be listed in the feature specification of every verb investigated.

According to the tests, Bulgarian verbs of motion fall into 4 main classes, as presented in Table 1.

[init, proc, -]	[-, proc, res]	[-, proc, -]	[init, proc, res]
Class 1	Class 2	Class 3	Class 4
<i>tancuvam</i> 'dance' <i>lōkatusha</i> 'meander' <i>vlacha se</i> 'walk slowly' <i>tōtrya se</i> 'walk slowly' <i>klatya se</i> 'walk slowly' <i>vōrvya</i> 'walk'	<i>padam</i> 'fall' <i>skacham</i> 'jump'	<i>pōlzya</i> 'crawl' <i>mōkna se</i> 'drag o.s.' <i>butam se</i> 'push o.s.' <i>tōrkalyam se</i> 'roll o.s.'	<i>myatam se</i> 'throw o.s.' <i>hwōrlyam se</i> 'throw o.s.' <i>minavam</i> 'pass' <i>stōpvam</i> 'step' <i>pluvam</i> 'swim' <i>plavam</i> 'float' <i>karam</i> 'drive' <i>ticham</i> 'run' <i>byagam</i> 'run' <i>letya</i> 'fly' <i>hwōrcha</i> 'fly'

Table 1: Subevent structure for motion verbs

An interesting question is what the relation is between this classification of verbs and the prefixation facts presented in (5), repeated below.

- (12) Combination of motion verbs and the prefixes *iz* 'from' and *do* 'to' in Bulgarian
- a. Some motion verbs allow only the Goal-directional prefix *do*.
  - b. Some motion verbs allow only the Source-directional prefix *iz*.
  - c. Some motion verbs allow both Goal *do* and the Source-directional prefix *iz*.
  - d. Some motion verbs allow neither Goal-directional *do* nor Source-directional prefix *iz*.

In the following subsections, I explore the combination possibilities of motion verb classes with these directional prefixes.<sup>5</sup> It should be noted that many of the combinations marked as ungrammatical, in fact, exist, but in these cases the prefix loses its spatial meaning and is either superlexical and conveys notions like *to finish (doing) something*, or forms an idiosyncratic unit with the verb resulting in a non-transparent meaning. To exemplify the first case, the Source prefix *iz* 'from' is homophonous with the *completive* superlexical prefix *iz* (Istratkova 2004). The verb *dance* can combine with the latter and mean *to dance a dance from beginning to end*, as in (13).

<sup>5</sup>The claims made throughout the entire paper apply only to the Source prefix *iz* and the Goal prefix *do*. There are other spatial prefixes expressing Source (*ot*) and Goal (*v*) in Bulgarian, however, they are much more restricted in their distribution than *iz* and *do*. Thus, there are many cases where a verb takes the Source prefix *iz*, but not *ot*. Since I will be interested in finding out under what conditions a verb can take a prefix expressing Source in general, I choose to look at the most productive ones.

Nevertheless, *dance* cannot take the Source *iz* and mean something like *to go out by dancing*, as in (14).

- (13) Shte iz-tancuvame edno tango.  
 FUT.AUX COMPL-dance.1PL one tango  
 ‘We’ll dance a tango dance (till the end)’
- (14) \*Shte iz-tancuvame ot stayata.  
 FUT.AUX from-dance.1PL from room.DEF  
 Intended: ‘We’ll dance out of the room’

An example for an idiomatic meaning of a prefixed verb is the combination of the Source prefix *iz* with the verb *hvərlyam se* ‘to throw oneself.’ In this case, the prefixed verb *iz-hvərlyam se* does not mean *to throw oneself out of somewhere*, but *to overreach oneself*.

Since the topic of this paper is the combination of motion verbs with directional spatial lexical prefixes, I disregard those examples in the belief that they are not relevant here.

### 2.2.1. Class 1 motion verbs and prefixes

The verbs in Class 1 are grammatical with the Goal prefix *do* ‘to.’ The Source prefix *iz* ‘out’ is, however, ungrammatical.

Class 1 [init, proc, -]	Source prefix	Goal prefix
<i>tancuvam</i> ‘dance’	* <i>iz-tancuvam</i>	<i>do-tancuvam</i>
<i>ləkatusha</i> ‘meander’	* <i>iz-ləkatusha</i>	<i>do-ləkatusha</i>
<i>vlacha se</i> ‘walk slowly’	* <i>iz-vlacha se</i>	<i>do-vlacha se</i>
<i>tətrya se</i> ‘drag one’s feet’	* <i>iz-tətrya se</i>	<i>do-tətrya se</i>
<i>klatya se</i> ‘walk slowly’	* <i>iz-klatya se</i>	<i>do-klatya se</i>

Table 2: Class 1 motion verbs and directional prefixes

### 2.2.2. Class 2 motion verbs and prefixes

The Class 2 motion verbs take only the Source prefix, and disallow the Goal prefix.

Class 2 [- , proc, res]	Source prefix	Goal prefix
<i>padam</i> ‘fall’	<i>iz-padam</i>	* <i>do-padam</i>
<i>skacham</i> ‘jump’	<i>iz-skacham</i>	* <i>do-skacham</i>

Table 3: Class 2 motion verbs and directional prefixes



### 2.2.3. Class 3 motion verbs and prefixes

Class 3 motion verbs are grammatical with both Source and Goal prefixes.

Class 3 [ _ , proc, _ ]	Source prefix	Goal prefix
<i>pəlzya</i> ‘crawl’	<i>iz-pəlzya</i>	<i>do-pəlzya</i>
<i>məkna se</i> ‘drag oneself’	<i>iz-məkna se</i>	<i>do-məkna se</i>
<i>butam se</i> ‘push oneself’	<i>iz-butam se</i>	<i>do-butam se</i>
<i>tərkalyam se</i> ‘roll oneself’	<i>iz-tərkalyam se</i>	<i>do-tərkalyam se</i>

Table 4: Class 3 motion verbs and directional prefixes

### 2.2.4. Class 4 motion verbs and prefixes

The verbs of motion belonging to Class 4 do not exhibit uniform behavior regarding their prefixation possibilities. They split into two subclasses — Class 4a which comprises verbs combining neither with a Source prefix, nor with a Goal prefix; and Class 4b whose members pattern like Class 3 verbs, in that they are grammatical with both prefixes.

Class 4a [init, proc, res]	Source prefix	Goal prefix
<i>myatam se</i> ‘throw oneself’	* <i>iz-myatam se</i>	* <i>do-myatam se</i>
<i>hvərlyam se</i> ‘throw oneself’	* <i>iz-hvərlyam se</i>	* <i>do-hvərlyam se</i>
<i>minavam</i> ‘to pass’	* <i>iz-minavam</i>	* <i>do-minavam</i>
<i>stəpvam</i> ‘to step’	* <i>iz-stəpvam</i>	* <i>do-stəpvam</i>

Table 5: Class 4a motion verbs and directional prefixes

Class 4b [init, proc, res]	Source prefix	Goal prefix
<i>ticham</i> ‘run’	<i>iz-ticham</i>	<i>do-ticham</i>
<i>byagam</i> ‘run’	<i>iz-byagam</i>	<i>do-byagam</i>
<i>letya</i> ‘fly’	<i>iz-letya</i>	<i>do-letya</i>
<i>hvərcha</i> ‘run’	<i>iz-hvərcha</i>	<i>do-hvərcha</i>
<i>pluvam</i> ‘swim’	<i>iz-pluvam</i>	<i>do-pluvam</i>
<i>plavam</i> ‘float’	<i>iz-plavam</i>	<i>do-plavam</i>
<i>karam</i> ‘drive’	<i>iz-karam</i>	<i>do-karam</i>

Table 6: Class 4b motion verbs and directional prefixes

To summarize, abstracting away from the verbs in Class 4b, to which I will come back later, the Source prefix appears to be available only for motion verbs that do not instantiate *init*. Similarly, the Goal prefix attaches only to motion verbs that have no *res* feature. The pattern is summarized in Table 7.

Class	features	example	Source prefix	Goal prefix
1	[init, proc, -]	<i>tancuvam</i> ‘dance’	*	ok
2	[-, proc, res]	<i>padam</i> ‘fall’	ok	*
3	[-, proc, -]	<i>pəlzya</i> ‘crawl’	ok	ok
4a	[init, proc, res]	<i>minavam</i> ‘pass’	*	*
4b	[init, proc, res]	<i>karam</i> ‘drive’	ok	ok

Table 7: Distribution of Source and Goal prefixes

It is rather unlikely that this correlation is accidental. Therefore, an obvious question to ask is what is it about the verbal subevential structure that determines which prefixes are compatible with it. Alternatively, we can let verbs play second fiddle and reformulate the question as: what is it about the prefix, that it is sensitive to the features of the verb it attaches to? In the next section, I address the latter question.

### 3. Prepositions and prefixes

Slavic prefixes are, with some minor exceptions, homophonous to spatial prepositions. It has been argued by Matushansky (2002) that prepositions and prefixes constitute a single category P and have the same morpho-phonological status (see also Tolskaya this volume). Thus, a preposition is a P head that has a DP or a CP complement. A prefix is a P head that takes a verbal projection as its complement. Even if we do not believe that prefixes are strictly identical to prepositions, Matushansky’s claim motivates a treatment of Bulgarian spatial prefixes on a par with spatial prepositions in at least some respects. For this reason, I now turn to Source and Goal prepositions in the hope that they can tell us something about the properties exhibited by their corresponding directional prefixes.

I adopt the vector space semantics developed by Zwarts (2005) for directional prepositions. Zwarts treats the denotation of directional prepositions as structured sets of paths. Paths are constructed as sequences of locations. More specifically, a path is a function  $\mathbf{p}$  from the unit interval  $[0,1]$  to positions, where  $\mathbf{p}(0)$  is the starting point of the path,  $\mathbf{p}(1)$  is the end point of the path, and for any  $i$  in the interval  $[0,1]$ ,  $\mathbf{p}(i)$  is the corresponding point of the path. Directional prepositions are defined by locating some point of the path in some region. For example, Source prepositions are defined by locating the starting point  $\mathbf{p}(0)$  of the path in a particular region relative to the Ground. Depending on where this region is with respect to the Ground, Source prepositions differ. Similarly, Goal prepositions are defined by locating the end point of the path  $\mathbf{p}(1)$  in a particular region relative to the Ground. Table 8 shows the composition of some Source prepositions and their corresponding Goal prepositions in English.

In other words, what all Source prepositions have in common is that they carry information about the starting point of the path, which can be

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		at	in	on
Source P	p(0)	from	out of	off
Goal P	p(1)	to	into	onto

Table 8: Source and Goal prepositions

*in*, *on* or *at* the reference object, and tell us nothing about where the end point of the path can be. Goal prepositions, on the contrary, tell us that the end point is *in*, *on* or *at* the reference object but carry no information about the starting point.

4. Putting verbs and prefixes together

4.1. Parallel between verbal decomposition and paths

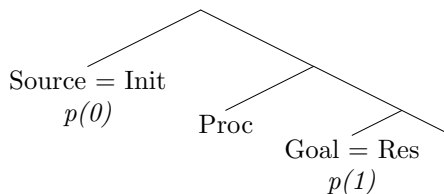
Recall from §2.1 that the *proc* head is the dynamic core of non-stative verbs. *InitP* and *resP* are, on the contrary, states. The *initP* and *resP* make the event bounded, the former denoting the initiation eventuality, or the cause, or the source, which all give rise to the process subevent. The *res* head introduces the result or the end of the process. Thus, it is natural to see *init* and *res* as marking the starting point and the end point of the event, respectively. We can draw a straightforward analogy with the prepositional domain and the semantics proposed by Zwarts for directional prepositions. As discussed in the previous section, Source prepositions encode the starting point of the path by specifying where the path starts. Goal prepositions encode the end point of the path by specifying where it ends.

	Paths		Verb subevents	
p(0)	Source	<b>start point</b> of a path	Init	<b>start point</b> of an event
p(1)	Goal	<b>end point</b> of a path	Res	<b>end point</b> of an event

Table 9: Parallel between verb subevents and paths

Hence, I suggest that both *init* and Source prepositions are endowed with a feature that marks a starting point, let us call this feature *p(0)*. Likewise, *res* and Goal prepositions are endowed with a feature *p(1)* which encodes an end point.

(15) Analogy between event structure and paths



Under such an analysis, prepositions and verbs differ with respect to how many features they can have. Namely, verbs can have more than one feature in their lexical specification, for example, the verb *padam* ‘fall’ is a [proc, res] verb, i.e., it encodes the process part and the end point of the event. Source and Goal prepositions, however, can be specified for only one feature — either  $p(0)$  or  $p(1)$ , i.e., they encode either only the starting point, or only the end point of the path.<sup>6</sup>

#### 4.2. Structure of prefixed verbs

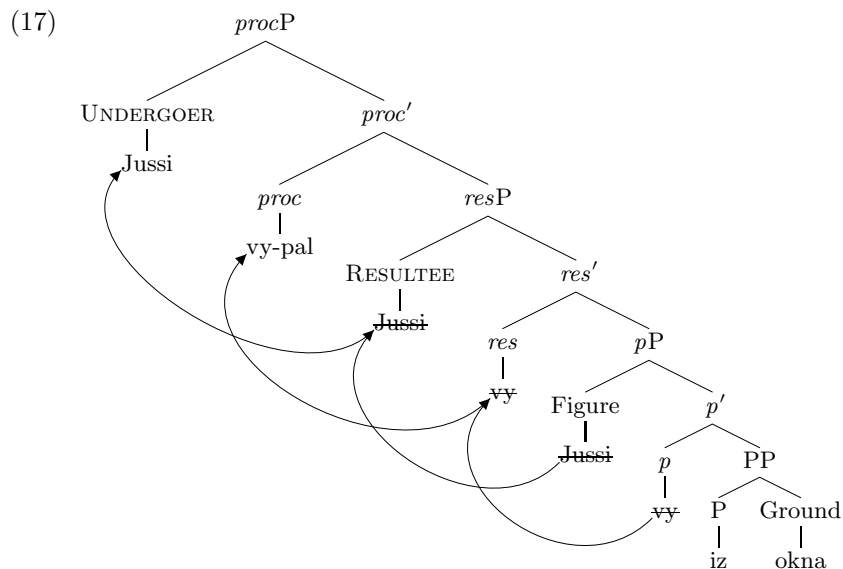
Ramchand and Svenonius (2002) discuss Germanic verb particle constructions and argue that the particle originates inside the prepositional phrase and then raises to the *res* head of the verb. Svenonius (2004a) notes the similarity between Germanic particles and Slavic prefixes and proposes that a similar analysis can be applied to Slavic prefixed verbs. Furthermore, he suggests that the prepositional projection can be expanded to accommodate the Slavic lexical prefixes.<sup>7</sup> In this paper, I adopt Romanova’s (2006) treatment of Russian prefixes. Romanova argues for an extended PP projection with a functional little *p* on top (cf. the extended PPs structures in Koopman 2000, Svenonius to appear, den Dikken to appear). Under her proposal, the big P head is occupied by lexical prepositions, while the functional little *p* is lexicalized by the prefix. Except for hosting the prefix, little *p* also introduces the Figure in its Specifier position. Romanova suggests that when the *res* head is not lexicalized by the verb, it is lexicalized by the prefix that moves there from little *p*, that is, from inside the extended PP. For example, the syntactic configuration she proposes for the sentence in (16) is presented in (17) (slightly adapted).

- (16) Jussi vy-pal iz okna.  
*Jussi from-fell from window.GEN*  
 ‘Jussi fell out from the window’

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<sup>6</sup>Still, prepositions can have additional features like [path], for instance. Crucial here is that no preposition will be able to be specified for *both*  $p(0)$  and  $p(1)$ .

<sup>7</sup>The same idea is developed in Rojina’s 2004 proposal that Russian prefixes incorporate into the verb from the highest head in the extended projection of the prepositional phrase, which she calls Dir.



Thus, the verb argument *Jussi* in the structure above forms a chain and also carries a composite role of UNDERGOER-RESULTEE. The prefix *vy-* ‘out,’ originating in little *p* inside the prepositional phrase, raises to the *res* head and then incorporates into the verb. The underlying mechanism for this derivation are merge and re-merge operations.

### 4.3. Condition on prefixation

Let us now turn back to the data presented in §2.2. Recall that, in verb Classes 1-4a, the Source and Goal-directional prefixes are in complementary distribution with the *init* and *res* heads, respectively. I argued in §4.1 that both *init* and Source prepositions have the feature  $p(0)$  which marks a starting point. Goal prepositions and *res* have the feature  $p(1)$ , encoding an end point. As discussed in §2.1, the verb’s categorial feature specification determines which heads it lexicalizes. Put simply, if we have an *init* head in the syntactic structure, it will be looking for a verb with an *init* (or a  $p(0)$ ) feature to lexicalize it. Now, it is just one short step to proposing that prefixes, too, can lexicalize subevents in the verbal domain. Suppose, it is so, then *init* will be lexicalized by a Source prefix and *res* will be lexicalized by a Goal prefix. In cases when the *init* head is already lexicalized by the verb, a Source prefix will be ungrammatical under the assumption that a head can be lexicalized by only one element. Such a hypothesis entails a complementary distribution of prefixes and subevents that are lexicalized by the verb, which also corresponds to the empirical facts for Class 1-4a and we can formulate the following rule on prefixation (to be revised later).

(18) **Condition on verb prefixation (1)**

A motion verb can have only prefixes that lexicalize a head which is not identified by the verb.

In other words, [init, proc] verbs like *dance* can take only Goal-oriented prefixes. The *fall* verbs will allow only Source prefixes, by virtue of being specified for [proc, res]. The *crawl* verbs will be compatible with both prefixes, since they have only the feature [proc] and, finally, *pass* verbs will take neither Goal nor Source prefixes because they encode both *init* and *res*.

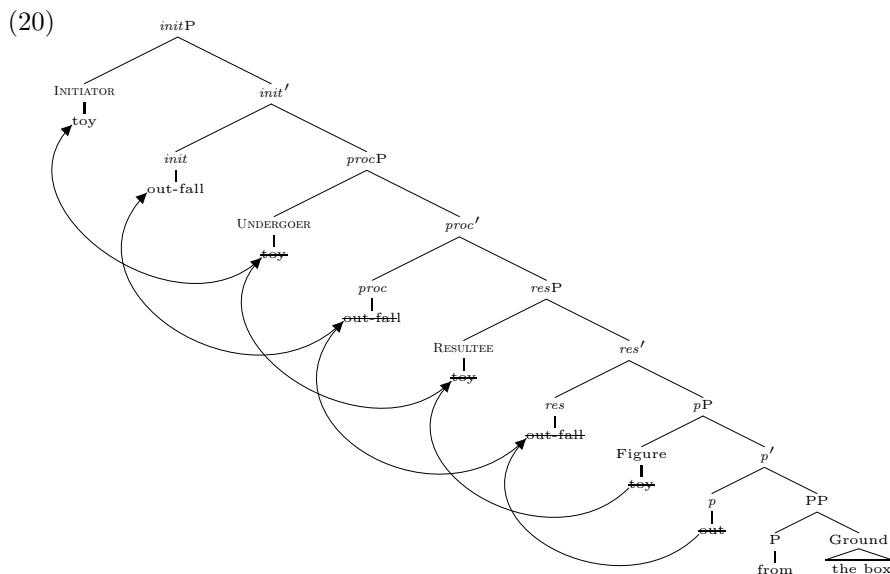
A prefix, then, lexicalizes a subeventual head in the verbal first phase, when the head is not instantiated by the verb itself *and* when the feature of the prefix matches the feature of the subeventual head. Therefore, a Goal prefix, bearing the feature  $p(1)$  cannot incorporate in the [proc, res] verbs of Class 2, because the only available head for the prefix will be the *init* head, which has the feature  $p(0)$ . A Goal prefix under the *init* head will then result in a feature mismatch. This excludes the possibility of Class 2 verbs taking Goal prefixes. The same reasoning applied to Source prefixes and *res* will prohibit Class 1 verbs from combining with the Source prefix *iz* ‘from.’

My analysis differs from Ramchand and Svenonius’s (2002) proposal for English particles and also Romanova’s (2006) account for Russian prefixes, according to which both Source and Goal particles/prefixes originate inside the prepositional phrase and raise as high as the *res* node. Under the present account, this happens only to Goal prefixes. Source prefixes, however, continue the upward movement to the *init* level and check their  $p(0)$  against the *init* head. The derivation for the verb *iz-padam* ‘fall out,’ then, will diverge from the one proposed by Romanova (2006) for its Russian equivalent in (16) and (17).<sup>8</sup>

- (19) Igrachkata iz-padna ot kutiyata.  
*toy.DEF out-fell from box.DEF*  
 ‘The toy fell out of the box’

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<sup>8</sup>I claim that the verb *fall* in Bulgarian is a [proc, res] verb, which is also in line with Ramchand’s in press analysis of English *fall*. This is contrary to Romanova’s 2006:105 analysis of *fall* as a *res*-less verb.



## 5. The MANNER of verbs

### 5.1. The puzzle of the Class 4b verbs

An apparent problem for this analysis is the verbs in Class 4b. They disallow the cumulative *na* prefix, which classifies them as *init* verbs. They can also have a goal of motion reading with locative prepositional phrases, which is a diagnostic for *res*. Thus, they are [init, proc, res] verbs, but nevertheless they allow Source and Goal prefixation. A question to be asked, then, is in which way the [init, proc, res] verbs of Class 4a are different from the [init, proc, res] verbs of Class 4b so that the former disallow the prefixes *iz* and *do*, while the latter are compatible with them and, in fact, pattern like Class 3 verbs. An obvious difference can be found in their meaning. For example, compare the pair below.

(21) Obiknoveno prilepите letyat prez peshterata.  
*usually bats.DEF fly.3PL through cave.DEF*  
 ‘The bats usually fly through the cave’

(22) Obiknoveno prilepите mina-va-t prez peshterata.  
*usually bats.DEF pass-SI-3PL through cave.DEF*  
 ‘The bats usually pass through the cave’

(21) says that (usually) there is an event in which the bats are flying through the cave and the sentence will be false if the bats are crawling through the cave, or using any other way to move themselves. What (22) says is that (usually) there is a state  $S_1$  in which the bats are not in the cave, which is followed by an event in which they are moving through the cave, and then

a state  $S_2$  obtains, when the bats are not in the cave again. Hypothesizing that the states  $S_1$  and  $S_2$  can be syntactically represented by the *init* and *res* heads, respectively, the role of the *proc* head of the verb *pass* is simply to establish the transition from the *init* state to the *res* state and it tells us nothing about how the subevent in between them happened (the bats could have used roller skates to move through the cave, but the sentence in (22) will still be true). The verb *fly* in (21), on the contrary, tells us something about *how* the bats were moving through the cave, but carries no information about either whether they were there before or whether they are going to be there after flying in it. Put in other terms, Class 4a verbs are punctual verbs and their *proc* head is less semantically loaded than the *proc* head of the activity verbs of Class 4b.

These observations justify a more detailed investigation of the components of verb meaning. The hunch behind it is that the semantic specification of verbs is connected to their syntactic behavior, in that verbs that participate in the same syntactic construction also share a meaning component (for an extensive discussion of such facts, I refer the reader to Levin and Rappaport Hovav 1991a and Levin and Rappaport Hovav 1991b).

Hence, it is possible that a variation in the fine-grained semantics of the verbs in Class 4a and 4b results in a different syntactic behavior. More specifically, the difference between them may be due to the fact that a particular component of their verbal meaning is associated (or “linked”) with different syntactic heads in the verbal decomposition. Such an approach is based on Hale and Keyser’s (1993) treatment of semantically similar verbs (like *splash* and *smear*), which exhibit different syntactic properties. They propose that the MANNER component of verbs like *splash* and *smear* can be internally or externally oriented. This receives a syntactic reflex in the causative-inchoative alternation: the alternation is possible for verbs that link their MANNER component to the lower verbal head (e.g., *They splashed mud on the wall* and *Mud splashed on the wall*). On the contrary, verbs that link their MANNER component to the higher verbal head are never inchoative (e.g., *They smeared mud on the wall* but *\*Mud smeared on the wall*).<sup>9</sup> The explanation for this is that, in the inchoative form, the upper verbal node is removed and, therefore, a MANNER specification which is linked to the higher verb cannot be expressed anymore.

Krifka (1999) also discusses the MANNER component in the meaning of English verbs and their ability to participate in different syntactic configurations, namely the Dative alternation. He deals with the issue from a purely semantic perspective and relates the possibility of a verb to participate in a Double Object (DO) frame and a Prepositional Object (PO) frame to [i] the semantic representation of the DO and PO frames, and [ii] the semantic MANNER component of the verb. The important point is that a meaning component of a verb requires the specification of (a) certain

<sup>9</sup>Slabakova (1997) argues that even Bulgarian prefixes have an internally or externally oriented MANNER component.



event(s). In syntactic terms, that would mean that a particular meaning component is linked to a particular verbal head à la Hale and Keyser.

## 5.2. Linking MANNER of Bulgarian motion verbs

Bulgarian verbs of motion alternate between a dative object construction and a construction where the object is expressed as a Goal-PP in a way that is reminiscent of the English Dative alternation.<sup>10</sup>

- (23) a. Maria myata topkata kəm men.  
*Mary throws ball.DEF towards me.ACC*  
 ‘Mary throws the ball to(wards) me’  
 b. Maria mi myata topkata.  
*Mary me.DAT throws ball.DEF*  
 ‘Mary throws me the ball’
- (24) a. Maria se myata kəm men.  
*Mary SE throws towards me.ACC*  
 ‘Mary throws herself to(wards) me’  
 b. Maria mi se myata.  
*Mary me.DAT SE throws*  
 ‘Mary throws herself at me’
- (25) a. Maria tərkalya topkata kəm men.  
*Maria rolls ball.DEF towards me.ACC*  
 ‘Mary rolls the ball to(wards) me’  
 b. \*Maria mi tərkalya topkata.  
*Mary me.DAT rolls ball.DEF*  
 (\*‘Mary rolls me the ball’)<sup>11</sup>
- (26) a. Topkata se tərkalya kəm men.  
*ball.DEF SE rolls towards me.ACC*  
 ‘The ball rolls to(wards) me’  
 b. \*Topkata mi se tərkalya.  
*ball.DEF me.DAT SE rolls*  
 (‘The ball rolls at me’)<sup>12</sup>

As we see from the data set above, Class 4a verbs (*myatam (se)* ‘throw (oneself)’) and Class 3 verbs (*tərkalyam (se)* ‘roll (oneself)’) differ in their syntactic properties in that the former participate in both the dative object and the Goal-PP construction, while the latter allow only a Goal-PP. Pending further investigation into the exact syntactic structure of the two constructions and the formal semantics of the verbs involved, I want to

<sup>10</sup>As in English, when the verb is transitive, the Goal-PP object version implies a movement to a goal, while the dative object version implies a change of possession.

<sup>11</sup>This sentence is grammatical under the reading *Mary rolls my ball*.

<sup>12</sup>This sentence is grammatical under the reading *My ball rolls*.

propose some speculations in order to explain why Class 4b verbs are compatible with the Goal and Source prefixes.

Recall from §5.1 that the verbs in Class 4a (both the transitive and the intransitive forms of *throw* being one of them), are punctual verbs whose lexical encyclopaedic content is such that it carries information about the initial and final state of an event and does not say much about its process part. Intuitively, this would mean that the MANNER component in the semantics of such verbs is linked (in the sense of Hale and Keyser 1993) to the *init* head (representing initial state) and *res* head (representing final state). The verbs in Class 4b, on the contrary, put a condition on the process part, which is interpreted as being carried out in a certain way (e.g., by flying, running, swimming, etc.), but such verbs do not specify the initial and final state of the event. It is quite plausible, then, that their MANNER component is linked to the *proc* head only.

Let us now look at the example in (26). There we have a [ -, proc, - ] verb *roll* whose MANNER is linked to the *proc* head only, first, because of its semantics as an activity verb, and, second, because of the lack of any other heads. As we see, a verb that conditions the *proc* head does not participate in the alternation. It is therefore interesting to check whether Class 4b verbs, for which I suggested that their MANNER component is also associated with the *proc* head only, allow both constructions.

- (27) a. Maria kara kolata kəm men.  
       *Mary drives car.DEF towards me.ACC*  
       ‘Mary drives the car to me’  
       b. \*Maria mi kara kolata.  
       *Mary me.DAT drives car.DEF*  
       (\*‘Mary drives me the car’)<sup>13</sup>

What we conclude from this is that Class 4b verbs pattern together with Class 3 verbs in two respects: [i] they link their MANNER component to the *proc* head, and [ii] they take both Goal and Source prefixes. Class 4a verbs, on the contrary, [i] associate their MANNER with the *init* and *res* heads, and [ii] disallow both Goal and Source prefixes. It follows that the directional prefix is unavailable whenever the following conditions are fulfilled:

- (28) A directional prefix cannot attach to a verb if:
1. the verb instantiates a subeventual head with the same feature as the one of the prefix (i.e.,  $p(0)$ ,  $p(1)$ )  
 and
  2. the verb links its MANNER component to this subeventual head.

In other words, when a Source prefix wants to attach to a verb, it needs to lexicalize an *init* head that is not projected by the verb. However, even

<sup>13</sup>This sentence is grammatical under the reading *Mary drives my car*.

if the verb identifies *init*, a Source prefix can still be grammatical provided the verb does not link its MANNER to the *init* head. Goal prefixes will work in the same way, but they will need a “free” *res* head.

It is obvious that a verb can link its MANNER component only to a head that is projected by the verb itself. That is, it is impossible for a verb that does not identify *init* to link its MANNER to an *init* head for the simple reason that the *init* head is not present. This allows us to simplify the statement in (28) in that we eliminate the first proposition in the conjunction.

- (29) A directional prefix cannot attach to a verb if the prefix lexicalizes a subeventual head that is conditioned by the verb’s MANNER component.

So, we can now restate the Condition on prefixation from (18)

- (30) **Condition on verb prefixation (revised)**  
A motion verb can have only prefixes that instantiate a head to which the verb’s MANNER component is not linked.

To recapitulate, Class 4a verbs cannot take Source and Goal prefixes, since they link their MANNER to the *init* and *res* heads. Verbs from Class 4b can have Source and Goal prefixes, despite the fact that they license *init* and *res*, because such verbs do not link their MANNER to any of these heads. In fact, it is conceivable that Source and Goal prefixes also have MANNER, as suggested by Slabakova (1997). Thus, I suggest that the Source and Goal prefixes also link their MANNER component to the heads they identify, just like verbs. Thus, their availability can be seen to be the result of a more general principle, as formulated in (31).

- (31) A subeventual head can be associated with the MANNER component of only one lexical item.

According to (31), if a verb links its MANNER to a particular head, no prefix can do so too, therefore, prefixation is impossible.

The revised Condition on prefixation in (30) will help capture the behavior of the transitive versions of motion verbs, like *butam* ‘to push’ and *mækna* ‘to drag.’ As discussed above, these Class 4a verbs link their MANNER to the *proc* head only. When transitive, the verbs in question have an external causer and they hence need an INITIATOR position for the agent. INITIATOR is the subject of *init* and therefore *init* will be present in the structure. Still, the ‘push’ and ‘drag’ verbs, even when transitive, link their MANNER to the *proc* head and thus the *init* head is “free.” It follows that Source prefixes will be allowed to combine with them.

## 6. Extensions

### 6.1. Source-Goal asymmetry

As I already mentioned, the main difference between the current account of Goal/Source prefixation and the previous accounts is that Source and Goal prefixes occupy two distinct positions in the decomposed VP instead of always moving to *res* (cf. Svenonius 2004a, Ramchand in press, Romanova 2006). Since I suggest different attachment sites for Source and Goal prefixes, it is expected that this is reflected in syntax and hence Source-prefixed verbs should behave differently from Goal-prefixed verbs. One obvious phenomenon to think about is the Goal-Source asymmetry, as discussed by Filip (2003).

- (32) Source modifiers form atelic (homogeneous) predicates. Goal modifiers form telic predicates.

(Filip 2003:ex.(29))

Given that the presence of a *res* head leads to a telic interpretation, Goal prefixes naturally derive telic verbs, whereas Source prefixes will have no impact on the telicity of the verb they incorporate into. My proposal is also highly compatible with Nam's (2005) account of directional locatives and the way he explains the Goal-Source asymmetry. Nam observes that Source modifiers do not shift the aspectual character of the inner event and suggests that they attach to a higher position than Goal modifiers.

In short, we can relate the Goal-Source asymmetry to the different attachment sites for the prefix. Still, the two prefixes are uniformly treated along the lines of Zwarts (2005) who does not make a distinction between Source and Goal Ps regarding their *prepositional* aspect. More precisely, according to Zwarts, both Goal and Source modifiers are telic, since they have cumulative reference.

### 6.2. Augmenting verbal structure

Under the current hypothesis, once a prefix attaches to the verb, it links its content to the head with matching feature. This is what happens with the verbs in Class 4b. In case the matching head is not instantiated by the verb, then it is first lexicalized by the prefix (as in Class 3, for instance) and then also associated with the content of the prefix. In the latter case, the syntactic structure of the prefixed verb is different compared to the unprefixed verb. For example, when a [ - , proc, - ] verb takes a Goal prefix, the Goal prefix instantiates the *res* head and therefore the heads lexicalized in the verbal First Phase will be [ - , proc, res]. Under such a scenario the Goal-prefixed [ - , proc, - ] verb should behave like any other unprefixed [ - , proc, res] verb. Hence, the *res*-test in §2.1 should diagnose the presence of *res*. In other words, if a *crawl* verb takes a Goal prefix, it should behave like a *fall* verb. The examples below demonstrate that the

prediction is borne out.

- (33) a. Maria pəlzya v kolibata.  
*Mary crawled in cabin.DEF*  
 ‘Mary crawled in the cabin’ (loc/\*dir)
- b. Maria do-pəlzya v kolibata.  
*Mary to-crawled in cabin.DEF*  
 ‘Mary crawled into the cabin’ (dir/\*loc)
- (34) Vidyah go da pada v dupkata.  
*saw.1S him COMP falls in hole.DEF*  
 ‘I saw him fall into the hole’ (dir/\*loc)

According to the test, verbs that instantiate *res* provide a directional reading with a locative PP. Since the directional reading is available in (33b), there is something identifying *res*. Suppose it is the verb *crawl*, then it is unclear why there is no directional reading for the PP in (33a). Therefore, the element identifying *res* must be the prefix *do* ‘to.’ Furthermore, since both the Goal-prefixed *crawl* verb and the *fall* verb lack an *init* projection, they should pattern together with respect to the cumulative *na* prefixation, which is allowed for *init*-less verbs. And they do.

- (35) a. Na-do-pəlzyaha mnogo chervei.  
*CUM-to-crawled many worms*  
 ‘Many worms came by crawling’
- b. Na-padaha mnogo shisharki.  
*CUM-fell many cones*  
 ‘Lots of cones fell’

Let us now turn to Source prefixation. Verbs that do not identify *init* should behave like unergatives once they are prefixed by a Source prefix, since *init* will then be identified by it. Therefore, the cumulative *na* prefix is expected to be bad in combination with the prefix *iz* ‘out.’

- (36) a. Na ulicata se na-tərkalyaha pijanici.  
*on street.DEF REFL CUM-rolled drunkards*  
 ‘Lots of drunkards rolled on the street’
- b. \*Na ulicata se na-iz-tərkalyaha pijanici.  
*on street.DEF REFL CUM-out-rolled drunkards*
- (37) a. Stotici blondinki se na-məknaha.  
*hundreds blondes REFL CUM-dragged*  
 ‘Hundreds of blondes came’
- b. \*Ot bara se na-iz-məknaha stotici blondinki.  
*from bar.the REFL CUM-out-dragged hundreds blondes*  
 (‘Hundreds of blondes came out from the bar’)

However, cumulative *na* is possible, if the verb takes a Goal prefix, which then instantiates *res*. This was illustrated above for the verbs *crawl*, but applies also for the other *proc* verbs.

- (38) Stotici blondinki se na-do-məknaha.  
*hundreds blondes REFL CUM-to-dragged*  
 ‘Hundreds of blondes came’

A possible counter-argument is that in (35a) and (38), the prefix *do* can be analyzed as the homophonous superlexical *terminal do*. However, Istratkova (2004) and Istratkova (in preparation) argues the terminative *do* attaches higher than cumulative *na*, which suggests that the *do* in (35a) and (38) is a lexical prefix.

## 7. Conclusion

In this paper, I investigated Bulgarian verbs of motion and their possibilities of combining with Source and Goal prefixes. Drawing on Ramchand’s (in press) tripartite verbal decomposition into *initP*, *procP* and *resP*, I first divided the motion verbs into four classes, depending on which subeventual heads they instantiate. Then, I analyzed the possibilities of each class to take a Source and a Goal prefix and, abstracting away from a subclass of verbs, the pattern which emerged showed a complementary distribution between the *init* feature of verbs and Source prefixes, on one hand, and the *res* feature of verbs and Goal prefixes, on the other. In order to account for this distribution, I adopted Matushansky’s (2002) proposal about the identity of prefixes and prepositions in Russian and also Zwart’s (2005) vector space semantics for Source and Goal prepositions. I argued that both *init* and Source prepositions encode a starting point of an event and a path, respectively, which is syntactically reflected by them having the feature  $p(0)$ . Similarly, the *res* head and Goal prepositions denote the end point of an event and a path, respectively, thus they have the feature  $p(1)$ . Hence, a single feature  $p(0)/p(1)$  is relevant for the syntax of two distinct categories — verbs and prepositions. This claim is in line with proposals that a feature such as  $\pm$ Bounded is relevant for the syntax of both verbs and nouns (see Bach 1986). Furthermore, I suggested that prefixes can instantiate verbal subevents.

The main proposal in this paper is that a verb can incorporate only those prefixes that do not lexicalize a subeventual head which is already lexicalized by the verb itself. This rule was modified by putting into play the MANNER component of the verb. I made use of the proposal by Krifka (1999), who relates the possibility of English verbs to participate in a Double Object frame and a Prepositional Object frame to the semantic representation of the two frames and the semantic MANNER component of the verb. I analyzed the behavior of Bulgarian with respect to a similar syntactic alternation and adopting Hale and Keyser’s (1993) linking of meaning

component to particular verbal heads, I suggested that *crawl* and *run* verbs have their MANNER linked to the *proc* head, while *throw* verbs link it to the *init* and *res* heads. The revised condition for prefixation thus states that a verb can take only prefixes that do not lexicalize a subeventual head which is both identified by the verb and associated with its MANNER component. This explains the fact that *crawl* and *run* pattern together with respect to Source/Goal prefixation, although the latter identifies the *init* and *res* heads. Finally, I discussed some of the consequences of such a proposal for the Source-Goal asymmetry. Under this proposal, even if both Goal and Source prepositions are telic, the asymmetry will follow from the fact that Source prefixes do not instantiate *res*, while Goal prefixes do. In fact, this is the crucial difference between the current account and previous proposals, which argue that prefixes raise only up to *res*. I showed that different attachment sites can provide an explanation for the different properties of a verb with a Source prefix versus the same verb with a Goal prefix.

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