Uninflected VPs, Deverbal Nouns and Aspectual Architecture of Russian[*]

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1. Introduction

In this paper, we take up Hana Filip's insights cited in (1a-b):

(1) a. The same principle of aspectual composition [as in English] also applies in Slavic imperfective sentences [...], with simple (underived) imperfective verbs that take measured and quantified Incremental Theme arguments. (Filip 2005b:263)

   b. The semantics of a prefix is clearly set apart from the aspectual semantics of a whole prefixed verb. The perfective semantics of a prefixed verb does not enter into the computation of the meaning of a bare (Incremental) Theme argument at the level at which it is composed with the prefix and the verb stem. (Filip 2005c:140)

In what follows, we will provide independent support for (1a-b) by taking into account meaning and distribution of deverbal nouns in -*nije/tije*. Our main observation is that nouns differ from fully inflected clauses in Russian with respect to the aspectual compostion. Clauses containing prefixed perfective verbs like *napisat'* 'write' are obligatorily telic and impose restrictions on the interpretation of the internal incremental argument. In contrast, corresponding nouns like *napisanie* 'writing' are not necessarily telic, and the range of interpretations of their incremental arguments is not restricted. For nouns, aspectual composition works in the same way as in English, exactly as Filip claims in (1a).

By hypothesis, complex event nominals in terms of Grimshaw (1990) contain at least the same VPs as fully inflected clauses (Kratzer

1996, Fu, Roeper and Borer 2001, Alexiadou 2001, 2004), but possess less functional structure above the VP. In this way, nominalizations provide us with an opportunity to see the properties of VPs at early stages of syntactic derivation, when (at least some of) the functional structure is not yet there. As a result, in deverbal nominals semantic characteristics of uninflected VPs are more transparently visible.[1] This is the reason why looking at deverbal nouns will be our strategy of discerning properties of uninflected VPs and showing that peculiarities of 'Slavic aspect' (discussed at least since Forsyth 1970) emerge at later stages of syntactic derivation, when the aspectual information comes into play, as (1b) suggests.

The rest of the paper is organized as follows. In section 2, we compare aspectual characteristics of deverbal nouns in Russian with those of fully inflected clauses. In sections 3.1-3.2, we motivate our semantic analysis of prefixed vs. non-prefixed transitive incremental stems in Russian. In particular, we suggest that the former but not the latter contain the result state in their semantic representations. In section 3.3, we develop our analysis of VPs and *v*Ps that are embedded under nominal projections and show how the aspectual composition works at this level. Main findings of this study and a few proposals about later stages of syntactic derivation are summarized in the Conclusion.

2. Aspectual composition

2.1. Verbs

It is commonly known that aspectual composition in Russian (and other Slavic languages) and English (and other Germanic, Romance and many other languages) is radically different.

The aspectual composition in English (see Verkuyl 1972, 1993, 1999, Krifka 1989, 1992, 1998; Filip 1999, among many others) is illustrated by sentences like *John wrote the letters in two hours/??for two hours* and *John wrote letters for two hours/*in two hours*. In such sentences, the quantization status of a verbal predicate is determined by that of the incremental argument, with the quantized Incremental Theme yielding a quantized verbal predicate, as in *wrote the letters*, and cumulative Incremental Theme resulting in cumulative verbal predicate, as in *wrote letters*.[2]

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[1] Essentially, examining constructions that lack some of the clausal functional structure is a strategy Kratzer (2003) offers for treating Zucchi's (1999) problem of indirect access.

[2] In what follows, we adopt standard definitions of quantization (QUA) and cumulativity (CUM) (Krifka 1989, 1992, 1998):

(i) $\text{CUM}(P) \leftrightarrow \forall x, y \,[\, P(x) \wedge P(y) \rightarrow P(x \oplus y)] \wedge \exists x, y \,[\, P(x) \wedge P(y) \wedge \neg x = y \,]$

In contrast with English, in Russian properties of incremental arguments do not affect telicity and quantization of a verbal predicate. Rather, verbs determine reference properties of the Incremental Theme (see Filip 1993/1999 and subsequent work, Verkuyl 1999, and references therein). In (2), the prefixed verb produces a verbal predicate which is obligatorily quantized (telic), as tests on co-occurrence with adverbials *dva časa* 'for two hours' in (2b) and *za dva časa* 'in two hours' in (2a) show.

(2) a. Vasja *na-pisa-l*   pis'm-a   (za   dva   čas-a).
       Vasja $_{PRF}$write$_{PST:M}$ letter$_{ACC:PL}$ in   two$_{ACC}$ hour$_{GEN}$
       1. *'Vasja wrote letters.'
       2. 'Vasja wrote (all) the letters (in two hours).'

    b. *Vasja *na-pisa-l*   pis'm-a   dva   čas-a.
        Vasja $_{PRF}$write$_{PST:M}$ letter$_{ACC:PL}$ two$_{ACC}$ hour$_{GEN}$

Besides, the prefixed perfective verb enforces the *unique maximal interpretation* of the undetermined plural and mass Incremental Themes (the term is coined by Hana Filip, see Filip 2005a). Thus, in (2a) *pis'ma* 'letters' involves a contextually specified quantity of letters, and the sentence indicates that all of them have been actually written.

The non-prefixed counterpart of *napisal* in (2) does not exhibit these peculiarities:

(3)   Vasja *pisa-l*   pis'm-a   (dva   čas-a).
       Vasja *write$_{PST:M}$*   letter$_{ACC:PL}$ two$_{ACC}$ hour$_{GEN}$
       1. 'Vasja was writing/wrote letters (for two hours).'
       2. 'Vasja was writing/wrote the letters.'

(3) shows that non-prefixed verbs do not require telicity, nor produce obligatorily the unique maximal interpretation. The natural generalization about prefixed verbs like *napisat'* in (2) follows:

(4) Prefixed incremental verbs like *napisat'* in (2) enforce the unique maximal interpretation of the Incremental Theme and quantization of the complex event predicate.

(ii)   QUA(P) $\leftrightarrow$ $\forall$x, y [P(x) $\land$ P (y) $\rightarrow$ $\neg$y<x]

    Krifka (1998:207-208) indicates that whereas the quantization necessarily implies telicity, the opposite does not hold. This difference is not significant for the below discussion, and terms 'telic' and 'quantized' will be used as synonyms. A strictly incremental relation between ordinary individuals and events must satisfy mapping to subobjects, mapping to subevents, uniqueness of objects, uniqueness of events (e.g., Krifka 1998: 211–213).

However, semantic properties of deverbal nouns presented in the next section suggest that this generalization should me modified significantly.

2.2. Nouns

Consider (5), in which the same prefixed verbal stem as in (2) is embedded under the nominal morphology:

(5) a. *Na-pisa-n-i-e*   pisem   zanja-l-o   dva   čas-a.
       $_{PRF}write_{NMN-NO-NOM}$ letters$_{GEN}$ take$_{PST-N}$ two   hour$_{GEN}$
       'Writing *all the* letters took two hours.'

In (5a), where the DP *napisanie pisem* is a subject of *zanimat' dva časa* 'take, occupy two hours', it is interpreted exactly as in the finite clause in (2a): the event predicate 'write (all the) letters' is quantized/telic, and the DP *pisem* 'letters' acquires the unique maximal interpretation. Now consider the non-elicited example (5b), where the DP *napisanie pisem* comes as a complement of the verb *zanimat'sja* 'be occupied, engaged'.

(5) b. Ja   celyj   den'   ne   vyxodi-l   iz
       I   whole   day   not   come.out$_{PST}$ from
       dom-a,   zanima-ja-s'   *na-pisa-n-i-em*   pisem.
       house$_{GEN}$ occupy$_{CONV-REFL}$ $_{PRF}write_{NMN-NO-INSTR}$letters$_{GEN}$
       {Context. Sorry for not visiting you yesterday.} 'I did not leave home for the whole day, engaged in writing letters'

Given the context, (5b), unlike (5a), does not indicate that there was a specific quantity of letters to be written. Rather, (5b) describes the Agent's activity that lasted for the whole day long. Furthermore, the DP 'letters' in (5b) does have the unique maximal interpretation: continuing (5b) with a statement like *a zavtra prodolžu pisat'* 'and I will go on writing tomorrow', which implies that some letters are still to be written, does not result in a contradiction. In this respect, (5b) contrasts sharply with a corresponding fully inflected clause: the sentence **Vasja napisal pis'ma, a zavtra prodolžit pisat'* 'Vasja wrote all the letters, and tomorrow he will continue writing' is definitely incoherent (cf. Filip 2005c:127). It should be noted as well that the referent of the DP pisem in (5b) is first introduced into the discourse, thus being indefinite.

Crucially, the event predicate denoted by *napisanie pisem* fails to be quantized in (5b). If, given the context, *napisanie pisem* can apply to some event *e*, it can also apply to proper parts of this event down to its

atomic parts: if the Agent's activity that lasted for the whole day can be described as *napisanie pisem*, smaller portions of this activity are *napisanie pisem*, too.

(5a-b) suggest that, depending on the context, *napisanie pisem* can have both quantized and non-quantized interpretations. Crucially, as (2b) shows, the latter option is not available for fully inflected clauses. We see, therefore, that the same verbal predicate containing the same pre-fixed verbal stem shows radically different behavior when realized in clausal and nominal environments: deverbal nouns like *napisanie* do not show restrictions characteristic of corresponding inflected clauses.

Moreover, prefixed nouns show the same range of possibilities as to the telicity/quantization and the range of interpretations of the Incremental Theme as non-prefixed ones. Replacing the prefixed deverbal noun *napisanie* in (5a-b) with its non-prefixed counterpart *pisanie* (6) does not result in ungrammaticality, nor change truth-conditions of these sentences.

(6) a.   *Pisa-n-i-e*   pisem   zanja-l-o   dva   časa.
        write$_{NMN-NO-NOM}$ letters$_{GEN}$ take$_{PST-N}$ two   hours
        'Writing *(all the)* letters took two hours.'

    b.   Ja   celyj   den'   ne   vyxodil   iz   doma,
        I   whole   day   not   come.out$_{PST}$ from   house$_{GEN}$
        zanima-ja-s'   *pisa-n-i-em*   pisem.
        occupy$_{CONV-REFL}$ *write*$_{NMN-NO-INSTR}$ letters$_{GEN}$
        'I did not leave home for the whole day, engaged in writing letters'

Therefore, for deverbal nouns all logically possible combinations of pre-fixed / non-prefixed stems and quantized (unique maximal)/cumulative Incremental Themes are attested: both stems can go with both types of the incremental argument. In inflected clauses, one possibility, namely, the prefixed stem combined with a non-quantized Incremental Theme, is ruled out.

If nominalization facts are taken seriously, a descriptive generalization follows: given that deverbal nouns based on prefixed and non-prefixed stems do not contrast as to their telicity and properties of the Incremental Theme, prefixed stems by themselves cannot be responsible for compositional effects observed in fully inflected clauses in (2a-b). If prefixed stems had induced telicity/quantization, there would have been no way for nouns to escape from being the same as corresponding finite clauses. Therefore, we have two problems to solve. First, we are to discern the difference between prefixed and non-prefixed stems and to determine their semantic rep-

resentations. Secondly, we have to develop a semantic analysis of VPs and vPs, the basic verbal projections, from which properties of deverbal nouns naturally follow. In the next sections we try to accomplish these tasks.

3. Deverbal nouns vs. inflected clauses

3.1. Prefixed vs. non-prefixed stems
In the literature, a few formal proposals accounting for the difference between prefixed and non-prefixed stems like *napisa-* and *pisa-* 'write' are found. Thus, Piñon 2001 and Paslawska, von Stechow 2003 suggest that prefixed and non-prefixed transitive stems differ in their logical type. Paslawska, von Stechow 2003 establish that prefixed stems take an individual as its internal argument (i.e., are of the type $<e, <s,t>>$), while non-prefixed stems are property-incorporating (i.e., are of the type $<<e,t><s,t>>$). Piñon (2001), in contrast, proposes for Polish that non-prefixed stems combine with ordinary individuals, while prefixed stems take generalized quantifiers, with a few additional semantic requirements. Ultimately, these approaches aim at capturing the fact that *in inflected clauses*, prefixed verbs cannot combine with undetermined plural and mass internal arguments without inducing the unique maximal interpretation. But, as nominalization facts discussed in the previous section suggest, this is not generally the case.

In this study, we explore another strategy of discerning differences between prefixed and non-prefixed stems like *pisa-* and *napisa-*. We suggest that they do indeed differ in their logical type, but not in what they require from the internal argument (and, possibly, other individual arguments), but in whether they have a state argument: prefixed stems do have such an argument in their semantic representation (together with the event argument), whereas non-prefixed stems do not.

Evidence for this claim comes from a few observations. First, adjectival passives based on prefixed stems refer to a result state of an event (see Schoorlemmer 1995, Paslawska, von Stechow 2003 and references therein), but those based on non-prefixed stems do not. Consider (7):

(7)　　Pis'mo *na*-pisa-n-o　　　　　‖ *pisa-n-o.
　　　　letter 　PRF write NMN:PART-N 　‖ write NMN:PART-N
　　　　{Context: The speaker holds a letter just written} 'The letter is written {so we can send it now}.'

If prefixed stems involve a relation between events and (result) states, we can account for (7) in a principled way: the stative reading is derived by binding the event argument existentially, thus externalizing the state argument. The resulting property of states, then, will be a denotation of the prefixed passive participle *napisano* used in the adjectival passive in (7).[3] Assuming that non-prefixed stems lack the state argument accounts naturally for inappropriateness of the passive participle *pisano* in (7): the state cannot be externalized, since there is no state argument to begin with.[4]

Secondly, if prefixed stems possess the result state specified in their semantic representation, we can expect to find cases when that state is accessible for various semantic operations, such as adverbial modification or negation, independently of the eventive component. For non-prefixed stems this option should be excluded in principle, since they do not have a state argument.

(8) shows that this prediction is borne out for prefixed and non-prefixed verbs under the scope of negation:

(8) a.　Vasja　ne　　*vs*-paxa-l　　　pole.
　　　　Vasja　not　　$_{PRF}$plow$_{PST:M}$　　field$_{ACC}$
　　　　'Vasja did not plow a/the field.'
　　　　→ 1. There was no plowing activity.
　　　　→ 2. The field has not been plowed to completion.
　　b.　Vasja　ne　　*paxa-l*　　　pole
　　　　Vasja　not　　*plow$_{PST:M}$*　　field$_{ACC}$
　　　　'Vasja did not plow a/the field.'
　　　　→ 1. There was no plowing activity.
　　　　→ 2.*The field has not been plowed to completion.

(8a) is ambiguous in a way (8b) is not. Both sentences can mean that the field has not been affected by plowing at all. However, (8a) has a second

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[3] Essentially, this is what Paslawska and von Stechow (2003), relying on Kratzer 2000, propose about the adjectival passive in Russian: they assume that Kratzer's Stativizer $\lambda R \lambda s \exists e.R(s)(e)$ applies to the denotation of VP, which is a two-place relation between events and states, to create a property of states.

[4] This does not mean, of course, that non-prefixed passive participles cannot occur in adjectival passives, cf. famous *Pisano v Bessarabii* 'written in Bessarabia' from Puškin's *Eugene Onegin* or *Pis'mo k indusu pisano mnoju* 'lit. The letter to the Hindu (has been) written by me' (Leo Tolstoy. *Dva pis'ma k Gandi* 'Two letters to Gandhi') (We are grateful to the anonymous reviewer for drawing our attention to the latter example). But arguably, in such configurations the adjectival passive does not describe a state at all: it either identifies Bessarabia as a place where the writing event occurs, or the speaker as the agent of such an event.

interpretation in which only the result state falls under the scope of negation: under this interpretation, the sentence is true iff it is not the case that the whole field attains the state of being plowed, despite the fact that some plowing activity has been performed. This latter interpretation is not available for (8b), as expected. [5]

A similar pattern is found if we examine the distribution of the restitutive reading of the adverb *opjat'* 'again' combined with prefixed and non-prefixed verbs (for the restitutive vs. repetitive readings see Dowty 1979, von Stechow 1996, Tenny 2000, among others). Compare the distribution of *opjat'* 'again' in combination with prefixed and non-prefixed verbs:

(9)   Vasja   opjat'   vs-kopa-l   ogorod.
        Vasja   again $_{PRF}$dig$_{PST:M}$ garden$_{ACC}$
   a. Repetitive reading: '(Vasja dug the ground in the garden before, and) he did it again.'
   b. Restitutive reading: '(The ground in the garden was dug before, and) Vasja did it again.'
(10)   Vasja   opjat'   kopa-l   ogorod.
        Vasja   again   dig$_{PST:M}$ garden$_{ACC}$
   a. Repetitive reading: '(Vasja had been digging the ground in the garden before, and) he was digging again.'
   b. $^{??}$Restitutive reading: '(Somebody had been digging the ground in the garden before, and) Vasja was digging again.'

In (9), the prefixed verb *vskopat'* 'PRF-dig' has both repetitive and restitutive readings (although some speakers suggest that in the null context, the former is better). At the same time, the non-prefixed verb *kopat'* 'dig' is definitely odd under the scope of restitutive *opjat'*. Again, if we assume that the restitutive reading obtains when only the result state falls under the scope of 'again', the difference between (9) and (10) is naturally explained, since non-prefixed stems, by hypothesis, do not involve the result state at all.

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[5] The anonymous reviewer has suggested that sentences like (8b), similarly to (8b) "implicate that the field was not completely plowed, and hence either no plowing activity took place or some plowing took place without reaching any result". However, we did not find a single native speaker who confirm this judgement: all judge the second interpretation in (10b) inappropriate.

3.2. Simplex vs. complex event templates

The above observations point towards analyzing prefixed stems like *napisa-*, *vspaxa-* and *vskopa-* as involving two components, an event and a result state of that event, while non-prefixed stems like *pisa-*, *paxa-*, and *kopa-* — as only specifying the eventive component[6]. In other words, we propose that prefixed and non-prefixed stems differ as to the event template they are associated with. More specifically, for non-prefixed and prefixed stems we assume event templates represented in (11a) and (11b) respectively:[7]

(11)   a. $\lambda x\ \lambda e\ [\ V'(e) \wedge \text{Theme}(x)(e)\ ]$ $<e, <s, t>>$
        b. $\lambda x \lambda s \lambda e\ [\ V'(e) \wedge \text{Theme}(x)(e) \wedge \text{cause}(s)(e) \wedge \text{Res}_V\ (s) \wedge$
            $\text{Arg}(x)(s)\ ]$ $<e, <s, <s, t>>>$

Essentially, (11a) is an activity event template for transitive verbs, while (11b) is an accomplishment template; they differ in their logical type ($<e, <s, <s, t>>>$ vs. $<e, <s, t>>$). We do not claim, of course, that templates in (11) do duty for all instances of non-prefixed and prefixed stems. Since our concern in this study is aspectual composition, we are dealing with transitive stems that denote incremental relations between events and internal arguments, since it is exactly this class of stems that exhibit compositional effects exemplified in (2). (11a-b), therefore, aim at capturing differences between prefixed and non-prefixed transitive incremental stems like *pisa-/napisa-* 'write', *čita-/pročita-* 'read', *kopa-/vskopa-* 'dig', *paxa-/vspaxa-* 'plough', etc. Semantic representation of non-prefixed/prefixed pairs that belong to other lexical classes (e.g. intransitive manner of motion verbs like *ply-/priply-* 'swim', inchoatives with superlexical prefixes like *smejat'sja/zasmejat'sja*, transitive verbs that do not involve the Incremental Theme like *česa-/počesa-* 'scratch', etc.) is a question that we do not address in this paper. It should be also noted that analyzing prefixed stems like *napisa-* as based on the accomplishment event template in (11b) does

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[6] There is a growing body of evidence that prefixes form a heterogeneous class as to their semantic and syntactic properties (see Filip 1993/99, 2000 and elsewhere for the extensive data and discussion). Our proposal does not concern superlexical, or external prefixes (Svenonius 2003, 2004, Ramchand 2004, DiSciullo & Slabakova 2005).
[7] Following Davidson 1967, Parsons 1990, and many others, we assume that natural language predicates denote properties of events. We assume neo-Davidsonian association of arguments with verbs via thematic roles. We take a logical representation with the basic types t (truth values), e (entities), s (states, events), and i (intervals of times); "x" ranges over entities, "e" over eventualities, both events proper and states, "s" over states, "t" over intervals of time, "P" over one-place predicates of any type (e.g., $<e, t>$, $<s, t>$), "R" over two-place predicates (e.g. $<e, <s, t>>$ or $<s, <s, t>>$).

not imply that any accomplishment verbs in Russian must be prefixed (in fact, we can easily find non-prefixed stems that should arguably receive an accomplishment analysis, e.g. *ranit'* 'wound').

The decompositional approach to accomplishments on which (11b) is based is found in the literature at least since Dowty 1979. Under this approach, accomplishments are decomposed into two subevents — the process subevent performed by the external argument, normally (but not always) the Agent, and change of state of the internal argument induced by this process. Various versions of decompositional analysis are found in Rappaport Hovav, Levin 1998 and elsewhere, Kratzer 2000, Pylkkänen 2002, Ramchand 2003, Rothstein 2004, among many others. In (11b), we assume the representation similar to that of Kratzer 2000, 2004 and Paslawska, von Stechow 2003, whereby the accomplishment template consists of an activity and a result state connected by Cause with no Become[8]. We also assume Kratzer's (1996) view that Agents are introduced syntactically. The content of both V' and Res_V is determined by the lexical meaning of the verb, with the Theme argument of V' being identical to a single argument of a Res_V[9].

In (12), lexical entries for a non-prefixed stem *pisa-* and the prefixed one *napisa-* are exemplified.

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[8] The anonymous reviewer has pointed out that in the literature, one can easily find arguments against a causative analysis of accomplishments. While we agree that this analysis is not theoretically unproblematic, developing an alternative theory of accomplishments goes far beyond the scope of this paper. For us, what is crucial is not causation, but the presence or absence of the result state in the lexical semantic representation. Nothing in the subsequent discussion relies on the causative relation between events and states in (11b), and that is the main reason for adopting the accomplishment event template in its present form, leaving issues of causation for future examination.

[9] The analysis in (11a-b) makes one further prediction about the distribution of prefixed and non-prefixed stems like *napisa-* and *pisa-*. As Rappaport Hovav, Levin 1998 and elsewhere show, transitive verbs associated with the complex event structure consisting of two subevents differ from those with the simplex event structure in that the latter can occur in the syntax without the direct object, cf. [OK]*John swept* vs. *John broke. This contrast, they claim, is due to the Argument-Per-Subevent Condition which requires there be at least one argument XP in the syntax per subevent in the event structure. Since *break*, but not *sweep* is lexically associated with the complex event structure, the given contrast receives an explanation. Therefore, if stems like *pisa-* and *napisa-* differ in that the former denotes a simplex, and the latter a complex event structure, we can predict that they contrast as to the obligatoriness of the direct object. This prediction is borne out: the prefixed verb is ungrammatical without the direct object, while its non-prefixed counterpart is readily available, cf. [OK]*Kogda ja pri-še-l, Vasja pisa-l* 'When I came, Vasja was writing' and **Kogda ja pri-še-l, Vasja na-pisa-l* 'When I came, Vasja wrote'.

(12) a. *pisa*- 'write':   λxλe [write(e) ∧ Theme(x)(e)]
     b. *na-pisa*- 'write, write up': λxλsλe [write(e) ∧ Theme(x)(e) ∧
                                           cause(s)(e) ∧ written(s) ∧ Arg (x)(s)].

The prefixed stem in (12b) possesses, in addition to the internal argument and event argument, a state argument associated with the resultant state attained by the Theme argument.[10] Representations in (12) suggest that lexical prefixes are *lexical V^0 modifiers,* as in Filip 1997, 1999, 2003, 2005c. We do not try to give a compositional semantics for the prefix *na-*, since we believe that lexical prefixes of this type combine with roots non-compositionally; otherwise we would expect that "cause(s)(e) ∧ written(s) ∧ Arg (x)(s)" part of (12b) comes with the prefix. But whereas the very presence of a result state in the semantic representation seems to be determined by the prefix, its descriptive content comes from the verbal stem. The fact that the accomplishment stem *napisa-* involves a state of being written cannon be a part of the meaning of a prefix, since we do not find this meaning component in other prefixed stems with *na-*, e.g. in *napolni-* 'fill' (in fact, *napolni-* involves a result state of being full). This suggests that the descriptive content of the result state is to be determined at the level of individual lexical entries and cannot be derived from the semantics of the prefix.

Now that we have established the analysis in terms of activity vs. accomplishment event templates, a few comments on the notion of accomplishment are due. The term "accomplishment" is many-way ambiguous in the current literature on aspect and event structure. In particular, it is frequently used to refer to *the aspectual class* consisting of verbal predicates that denote events having duration and a natural endpoint. Under this reading, accomplishment verbs are telic verbs. In this study, however, similarly to Rappaport Hovav and Levin 1998, Rothstein 2004 and many others, the term "accomplishment" is taken to refer to complex event structures like that in (11b). Furthermore, telicity and event structure have to be separated (Rappaport Hovav and Levin 1998 and elsewhere, Ramchand 2003, 2004): specifying the result state in the lexical representation of a verbal stem does not guarantee telicity; nor, the other way round, absence of the result state entails atelicity. Both accomplishment and activity event structures can yield telic/quantized and atelic/non-quantized event predicates. In the next section, we will show this more explicitly.

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[10] Here we ignore for simplicity a widely recognized problem of creation verbs, namely, that the object denoted by the Theme argument only exists completely at the end of the event. See, e.g., Zucchi 1999, von Stechow 2002, and the literature therein.

3.3 Deriving VPs and vPs

In this section, we will provide a compositional analysis of uninflected *v*Ps in Russian that are embedded under nominal projections yielding deverbal nouns like *pisanie* and *napisanie* in (5)-(6). Assuming that *napisanie pisem* (5) and *pisanie pisem* (6) are analysed as in (13a-b) (see Pazelskaya, Tatevosov 2004 for justification and further discussion), for both of them we have to derive telic and atelic interpretations and show that these interpretations are fully compatible with the analysis of prefixed and non-prefixed stems introduced above.

(13)   a. [... [$_{NP}$ -i- [$_{NominalP}$ -n- [$_{vP}$ AGENT [$_{VP}$ napisa- pisem]]]]]
         b. [... [$_{NP}$ -i- [$_{NominalP}$ -n- [$_{vP}$ AGENT [$_{VP}$ pisa- pisem]]]]]

3.3.1 Verbs and their complements

While prefixed and non-prefixed stems are analyzed as in (12) above, for plural NPs we assume semantic representation in (14):

(14)   [$_{NP}$ pis'ma]: $\lambda y.letters(y)$ AXIOM: CUM($\lambda y.letters(y)$)

Since issues of nominal plurality are irrelevant for our present purposes, we do not provide a compositional analysis of plurals, assuming simply that NPs like *pis'ma* denote cumulative predicates that have sums of ordinary individuals in their extensions (see Link 1983 and much subsequent work).

NPs of the predicative type $<e,t>$ can be shifted into one of the appropriate argumental types by type-shifting operators heading the DP. We assume that type-shifters apply freely to the denotation of NPs only subject to general constraints on type-shifting (see, e.g., Dayal 2004). The result of their application to NPs are DPs that denote individuals (of the type *e*) or generalized quantifiers (of the type $<<e, <s, t>>, <s, t>>$). In what follows, we make use of two type shifters represented in (15):

(15)   Type-shifting operators (cf. Filip 2005c; Dayal 2004):
         a. $\exists$: $\lambda P \lambda R \lambda e \exists x [P(x) \wedge R(x)(e)]$ ($<<e, t>, <<e, <s, t>>, <s, t>>>$)
         b. σ: $\lambda P \sigma x.P(x)$ ($<<e,t>, e>$)
         $\sigma x.Px$ is the maximal element in the extension of P (Link 1983).

By functional application, combining operators in (15) with the NP denotations in (14) results in (16a-b):

(16)   [$_{DP}$ SHIFT [$_{NP}$ *pis'ma*]], where SHIFT is a type-shifting operator
    a. $\lambda R \lambda e \exists y[\text{letters}(y) \wedge R(y)(e)]$ ($\exists$-letters, for short)
    b. $\sigma y.\text{letters}(y)$ (σ-letters, for short)

In (16a), the DP (referred to below as $\exists$-letters) denotes a generalized quantifier, a function from two-place relations between individuals and events to one-place event predicates. The DP in (16b) denotes a maximal individual in the extension of the predicate *pis'ma* 'letters'.

    For the moment, we have four pieces of the VP-internal material available: two instances of the V head represented in (12a-b), and two possible DP complements of this head in (16a-b). This gives us four possibilities listed in (17):

(17)   a. [$_{VP}$ pisa- [$_{DP}$ σ-pis'ma]]
    b. [$_{VP}$ pisa- [$_{DP}$ $\exists$-pis'ma]]
    c. [$_{VP}$ napisa- [$_{DP}$ σ-pis'ma]]
    d. [$_{VP}$ napisa- [$_{DP}$ $\exists$-pis'ma]]

    In Section 1, we observed that prefixed and non-prefixed deverbal nouns allow for two interpretations each (see (5a-b) for prefixed and (6a-b) for non-prefixed stems). We argue that these interpretations can essentially be reduced to structures in (17), and thus accounted for. Let us now explore these possibilities in more detail.

3.3.2 Quantized event predicates
First, consider prefixed and non-prefixed stems combined with σ-letters (of the type *e*). The DP provides a suitable argument for the verb, so by functional application, the following denotation of the VP in (17a) obtains:

(18)   [$_{VP}$ pis- [$_{DP}$ σ-pis'ma]]: $\lambda e[\text{write}(e) \wedge \text{Theme}(\sigma y.\text{letters}(y))(e)]$

(18) denotes a property of events in which the maximal individual $\sigma y.\text{letters}(y)$ participates as the Theme in the writing event.
    In the same way, the prefixed verb takes the Theme in (19), corresponding to (17c):

(19)   [$_{VP}$ na-pis- [$_{DP}$ σ-pis'ma]]:
    $\lambda s \lambda e[\text{write}(e) \wedge \text{Theme}(\sigma y.\text{letters}(y))(e) \wedge \text{cause}(s)(e) \wedge$
    $\text{written}(s) \wedge \text{Arg}(\sigma y.\text{letters}(y))(s)]$

Unlike in (18), in (19) saturating the internal argument produces a relation between events and states, not a property of events.

Following Alexiadou 2001, we assume that the *v* head can be present in nominalizations but is 'deficient' in that it cannot host the argument DP in its Spec and cannot assign the accusative case. However, it contributes to the eventive interpretation of the vP and can be detected by various diagnostics cited in the literature (Alexiadou 2001, Alexiadou 2004, van Hout, Roeper 1998, Fu et al. 2001), e.g. by agent-oriented adverbials or purpose adjuncts, as in *(na)pisanie pisem s cel'ju dobit'sja podderžki* 'writing (the) letters in order to gain the support'

We implement this by representing the semantic content of *v* as a property of events in (20):

(20) $\|v\| = \lambda e \exists x [Agent(x)(e)]$

With Kratzer 1996, we assume that Agents are always introduced conjunctively, by Event Identification[11]. Thus, the event predicate denoted by the VP in (18) combines with the Agent in (20) to yield a new event predicate such that an event *e* satisfies this predicate iff *e* is a writing event in which the maximal individual from the denotation of 'letters' is involved as a Theme, and there is an individual that stands in the Agent relation to *e*:

(21) $[_{vP}$ Agent $[_{VP}$ pis- $[_{DP}$ σ-pis'ma $]]]$:
        $\lambda e \exists x [Agent(x)(e) \wedge write(e) \wedge Theme(\sigma y.letters(y))(e)]$

In a similar way, the Event Identification introduces Agents when the VP complement of *v* is of the type <s, <s,t>>, as in (19) above:

(22) $[_{vP}$ Agent $[_{VP}$ na-pis- $[_{DP}$ σ-pis'ma $]]]$:
        $\lambda s \lambda e \exists x [Agent(x)(e) \wedge write(e) \wedge Theme(\sigma y.letters(y))(e)$
        $\wedge cause(s)(e) \wedge written(s) \wedge Arg(\sigma y.letters(y))(s)]$

We see that the logical type of these VPs is preserved — <s,t> for non-prefixed stems, and <s, <s,t>> for prefixed stems. As a result, vPs

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[11] For $\|v\|$ in (20) to be able to combine with the denotation of VP, we assume two versions of the Event Identification (EI) (see Kratzer 1996 for the original formulation):
(i)   EI for <s,t>-type VPs: $f_{<s,t>}$ $g_{<s,t>}$ → $h_{<s,t>}$: $\lambda e[f(e) \wedge g(e)]$
(ii) EI for <s, <s,t>>-type VPs: $f_{<s,t>}$ $g_{<s,<s,t>>}$ → $h_{<s,<s,t>>}$: $\lambda s \lambda e[f(e) \wedge g(s)(e)]$

embedded as complements of the Nominal head *-n/t-* (see (13)), are of the same type as corresponding VPs, with both event and state arguments of the prefixed stem still active.

Given that deverbal nouns based on prefixed stems can only have eventive, but not stative interpretation (neither *napisanie*, nor *pisanie* can refer to a state of being written), we conclude that the eventizer in (23) (Paslawska, von Stechow 2003) applies obligatorily to the denotation of vPs of the type $<s, <s,t>>$.[12] For (22), this yields (24):

(23) $\| \text{EVENT} \| = \lambda R \lambda e \exists s\ [R(s)(e)]$

(24)   EVENT $[_{vP}$ Agent $[_{VP}$ na-pis- $[_{DP}$ σ-pis'ma $]]]$:
         $\lambda e \exists s \exists x\ [\text{Agent}(x)(e) \land \text{write}(e) \land \text{Theme}(\sigma y.\text{letters}(y))(e)$
         $\land \text{cause}(s)(e) \land \text{written}(s) \land \text{Arg}(\sigma y.\text{letters}(y))(s)]$ $<s, t>$

(24) denotes a set of writing events in which the maximal individual consisting of all the contextually relevant letters is involved as a Theme and enters the result state of being written, and in which there is an Agent.

Compare event predicates in the denotation of non-prefixed and prefixed vPs in (21) and (24). Despite all differences, (21) and (24) are fundamentally similar in that both are quantized. Due to incrementality of the Theme relation, in (21) no proper part of the event in which the maximal individual is written is an event in which the same individual is written, hence no proper part of an event from the denotation of this predicate falls under the denotation of this predicate. Exactly for the same reason, the event predicate in (24) is quantized, too.

By assumption, event predicates in (21) and (24) are exactly what NPs *pisanie pisem* and *napisanie pisem* in (5a) and (6a) denote. If so, we have an explanation for how their telic/quantized interpretations emerge.[13]

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[12] Paslawska, von Stechow 2003 treat EVENT as an adjunct to a constituent that denotes relations between events and states (to a VP, in their system). Alternatively, it can be thought of as a head of the special functional projection involved in derivation of deverbal nouns. Yet another option is that the eventizer is a part of the denotation of the N head (the *-i-* morpheme) itself. We leave this question for further study.

[13] One further issue, not addressed in the present paper, is that deverbal nouns like *napisanie*, when take singular countable arguments (e.g. *napisanie pis'ma* 'writing a letter') allow for the atelic interpretation, too. As the anonymous reviewer pointed out, this is problematic, since event predicates with singular countable Incremental Themes are necessarily quantized. However, this problem exists independently from nominalization facts discussed in the present paper. Tatevosov (2003) shows that Filip's (2000 and elsewhere) analysis of the delimitative verbs faces the same complication: the delimitative prefix *po-* can be freely combined with quantized predicates like *pisat' pis'mo* 'write a/the

In the next section, we discuss two other options in (17), namely (17b) and (17d), in which the DP ∃-letters of the generalized quantifier type <<e, <s,t>>, <s,t>> creates non-quantized event predicates.

3.3.3 Non-quantized event predicates

Derivation of VPs and vPs involving ∃-letters as the internal argument (see (17b) and (17d) above) proceeds in a similar way as that with σ-letters, namely, by introducing the Agent, existentially bound, via Event Identification, and by applying the Eventizer to the prefixed vPs. This gives us representations in (25):

(25)   a. [$_{vP}$ Agent [$_{VP}$ pis- [$_{DP}$ ∃-pis'ma]]]
         b. EVENT [$_{vP}$ Agent [$_{VP}$ napis- [$_{DP}$ ∃-pis'ma]]]

Unlike in cases with σ-letters, however, the DP containing ∃-letters cannot be interpreted in situ, since it is of a generalized quantifier type, not of the individual type *e*. As a result, it has to raise at LF and find a relation between individuals and events to apply to. Raising leaves a trace, a variable of the type *e*, and creates a λ-abstract on that variable, as usual. (26), in particular, shows the LF which obtains if the generalized quantifier adjoins to the vP in which a non-prefixed VP is a complement:

(26)   ∃-pis'ma λ_1 [$_{vP}$ Agent [$_{VP}$ pis- [$_{DP}$ t_1]]]:
         $\lambda e \exists y[\text{letters}(y) \land \exists x[\text{Agent}(x)(e) \land \text{write}(e) \land \text{Theme}(y)(e)]]$

A writing event *e* falls under the denotation of the event predicate in (26), iff there is an individual *y* such that letters(y) and *y* stands in the Theme relation to the event, and there is an individual that stands to the Agent relation to the event. Obviously, the predicate in (26) fails to be quantized (given that letters is divisible and the Theme relation is incremental), since if *e* is an event in which letters are written, *e'*, a proper part of *e*, is also an event in which (a smaller portion of) letters are written.

Finally, a possible semantic representation of the event predicate that obtains if ∃-letters occurs as a complement of a prefixed stem is given in

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letter' (cf. *popisal pis'mo* 'wrote a/the letter for a while'), while it is predicted that it can only take homogeneous predicates as its arguments. As a tentative solution, Tatevosov (2003) proposes a shift in the denotation of a nominal predicate that allows it to refer to parts of entities in its original extension, with the resulting predicate being cumulative. The same solution, we believe, can be adopted for *napisanie pis'ma* as well.

(27). Here again, movement of the complement DP in (25b) leaves a trace of the type e and creates a λ-abstract of the type $<e, <s, t>>$:

(27)   ∃-pis'ma λ_1 [EVENT [$_{vP}$ Agent [$_{VP}$ na-pis- [$_{DP}$ t_1]]]]:
         $\lambda e \exists y$ [letters(y) $\wedge$ $\exists s \exists x$ [Agent(x)(e) $\wedge$ write(e) $\wedge$ Theme(y)(e)
              $\wedge$ cause(s)(e) $\wedge$ written(s) $\wedge$ Arg(y)(s)]]

The crucial observation about the predicate in (27) is that it fails to be quantized, too, despite the fact that the result state is specified in it explicitly. Given that, by assumption, λy.letters(y) is not quantized, but cumulative, and the Theme relation is incremental, if e is an event in which some letters y have been affected by writing and entered a result state of being written, then e', $e' < e$, is an event in which some letters y' (a proper part of y) have been affected by writing and entered a result state of being written as well. Therefore, both e and e' fall under the denotation of event predicate in (27), hence this predicate fails to be quantized.

Since, by hypothesis, event predicates in (26)-(27) represent the meaning of NPs *napisanie ∃-pisem* and *pisanie ∃-pisem* in (5b) and (6b), atelicity of both prefixed and non-prefixed deverbal nouns observed in section 2 is consistently accounted for.

4. Concluding remarks
Evidence from aspectual composition in deverbal nouns discussed so far confirms Hana Filip's (2005a,b and elsewhere) generalizations and analysis (see quotations in Section 1). One of the main claims that Filip has been making in her recent work is that there is a crucial distinction between aspectless stems like *napisa-* and perfective verbs like *napisat'* with respect to their contribution to the semantics of a sentence. It is perfectitivy which is responsible for the obligatory telicity and the unique maximal interpretation, as Filip 2005c shows.

Deverbal nouns provide independent support for this analysis. Since nominals like *pisanie pisem* and *napisanie pisem* only contain a part of clausal functional structure, they provide us with the direct access to the properties of vPs/VPs. We found that both non-prefixed stems like *pisa-* and prefixed stems like *napisa-* can be combined with any DPs, yielding four possibilities listed in (17a-c) and represented in (21), (24), (26) and (27). At the vP level, therefore, aspectual composition in Russian works in the same way as in 'non-aspectual languages' like English, exactly as Filip claims. Nouns are formed from vPs based on aspectless stems, while verbs cannot escape from being combined with an aspectual opera-

tor, which comes into play later, when the aspectual head Asp is merged above the vP. The perfective operator sitting in Asp filters out the non-telic event predicate with ∃-letters in (27), but does not affect the telic event predicate with σ-letters in (24), thus enforcing telicity and the unique maximal interpretation of the Incremental Theme (see Pazel-skaya, Tatevosov 2004 for an articulated proposal). In other words, components of meaning of what is traditionally conceived of as "the perfective verbs" are distributed between different heads, with perfectivity being separated from the meaning of the prefixed stem and located in the Asp head. Deverbal nouns are formed when perfectivity is not yet there, and that is the reason why they are different from fully inflected clauses.

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