RUSSIAN VERBAL PREFIXES AND THE PROJECTION ARCHITECTURE

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Russian perfectivity paradigms raise a complex network of formal issues for the projection architecture of LFG, including the structure of morphological representation and its relationship to the c-, f- and a-structures, with some consequences that appear to favor description-by-analysis over codescription for semantic interpretation. This paper presents the data and navigates its formal implications, suggesting in the end that a Paradigm Function Morphology (Stump 2001; Sadler & Nordlinger 2004, 2006) approach to the m-structure allows a clear description of the Russian facts that is equally compatible with both codescription and description-by-analysis.

Russian verb roots have inherent perfectivity specifications (1a), and stems can be successively perfectivized (1b,d) and imperfectivized (1c) by affixation:

(1)
a. *stroi- -yet*
build.[IMPF] 3SG.SUBJ
'she/he builds [houses]'

b. *na- stroi- -yet*
SP.CUMUL.[PERF] build.///// 3SG.SUBJ
'she/he builds a lot [of houses]'

c. *na- stra- -yva -yet*
SP.CUMUL.///// build.///// [IMPF] 3SG.SUBJ
'she/he builds a lot [of houses]'

d. *po- na- stra- -yva -yet*
SP.DISTR.[PERF] SP.CUMUL.///// build.///// ///// 3SG.SUBJ
'she/he builds a lot [of houses] everywhere'

The root *stroi-* in (1a) is inherently IMPF, but the prefixed cumulative verb in (1b) is PERF; it has a further IMPF form (1c), which the distributive prefix in (1d) perfectivizes. The words in (1b-d) can also be glossed and translated as in (1b′-d′):

(1)

b′. *na- stroi- -yet*
LP.[PERF] build.///// 3SG.SUBJ
'she/he tunes [a guitar]'

c′. *na- stra- -yva -yet*
LP.///// build.///// [IMPF] 3SG.SUBJ
'she/he tunes [a guitar]'

d′. *po- na- stra- -yva -yet*
SP.DISTR.[PERF] LP.///// build.///// ///// 3SG.SUBJ
'she/he tunes [all her/his guitars]'

The foregoing verbs exemplify the relevant perfectivity affixes of Russian, which are categorized in the literature (Ramchand 2008; Smith & Rappaport 1997; Svenonius 2004) as: the secondary imperfective suffix (2Impf), i.e. *-yva* in (1c,d,c′,d′), which here triggers a stem alternation; lexical prefixes (LPs), as *na-* in (1b′-d′); and superlexical prefixes (SPs), as *na-* in (1b-d), and *po-* in (1d,d′).

Secondary imperfective can only be suffixed to perfective stems—compare the derived perfective in (1b) to (1c)—or any inherently perfective root. Attaching 2Impf directly to an inherently imperfective root, e.g. ∗*stra–yva–yet*, is ungrammatical.

The two prefix types are drawn from the same set of forms and are uniformly perfectivizing, but they differ in their other properties. LP-derived stems have idiosyncratic meanings (compare (1a) 'build' with (1b′) 'tune', can have additional arguments compared with underived stems, always have a 2Impf form, but cannot take additional LPs. SP-inflected stems mostly disallow 2Impf ((1c) is an exception), though SPs can be attached to 2Impf stems (compare (1c) and (1d)), and can stack with each other (1d) and with LPs (1d′). SPs do not license argument structure but add information about the progress of the event, such as cumulativity and distributivity.

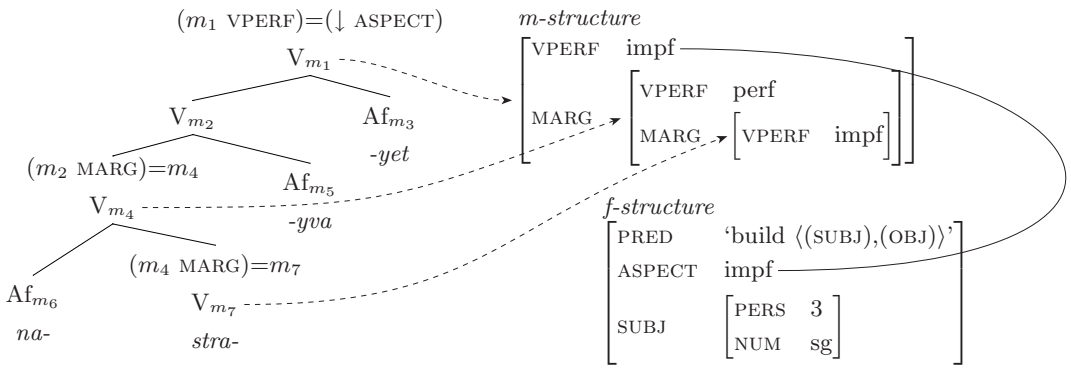
An analysis of Russian perfectivity paradigms must account for the argument-structure and idiosyncratic effects of LPs, the co-occurrence restrictions between affixes, and the alternating perfectivity values of verbs. We account for these various facts by exploiting the projection architecture of LFG.

First, we propose that LP-stems are memorized. This immediately accounts for their idiosyncratic meanings: *na-stroi-* 'tune' may be historically derived from *stroi-* 'build', but they bear no synchronic relationship. Memorization of LP-stems also explains how their argument structures can differ from those of the bare roots from which they are historically derived: different lexemes project different a-structures. The status of LP-stems in our account is somewhat analogous to that of particle verbs in English.

Second, we show that an m-structure account of co-occurrence restrictions is desirable. Consider (1b): the f-structure of a sentence headed by this verb must get its PRED from the verb root, and its [ASPECT perf] feature from the SP *na-*, which is accounted for directly if these two morphemes share an f-structure. But functional uniqueness prevents a pure f-structure account, since the verb root *stroi-* has its own [ASPECT impf] feature, as (1a) shows.

One solution is to use an m-structure, projected from the c-structure and codescribed in sublexical rules via the correspondence funtion μ. In this view perfectivity affixes function as m-structure heads with their own VPERF specfications, and with stems as their morphological arguments (MARG). Thus the structure of (1c) is as in (2), where all f-structure annotations on the daughter nodes are $\uparrow{=}\downarrow$, and all unmarked m-structure annotations are $\mu(\mathcal{M}(*)){=}\mu(*)$ (in the notation of Kaplan (1987)):

(2)



Co-occurrence restrictions are captured as contraints placed by affixes on the VPERF value of their MARG; the 2Impf suffix is thus lexically specified as $(\mu(\mathcal{M}(*))$ MARG VPERF$)=_c$perf. The c-structure rule for VP ensures that the ASPECT attribute of the f-structure of its V daughter has the value of outermost m-structure defined by the sublexical rules. The alternating perfectivity values of verbs are, on this account, a mere matter of morphosyntactic accounting.

This, however, poses problems for the glue semantics codescription approach to the syntax–semantics interface (Dalrymple 1999). Perfectivity is semantically interpreted. Hence morphemes codescribing perfectivity must carry a meaning constructor, projecting via the f-structure to the s-structure through the correspondence function composition $\sigma \circ \phi$, and composing with other such constructors to yield appropriate interpretations (we follow Ramchand (2008) in treating perfectivity as temporal definiteness). But both perfectivity affixes in (2), plus the root, must then have such a meaning constructor. All these meaning constructors would then enter the derivation, an undesirable consequence since this word clearly is semantically imperfective (and cumulative), not a perfectivized–re-imperfectivized imperfective, if a coherent (as opposed to merely successful) glue proof could even be achieved for such a thing.

This indicates that codescription is inadequate for modeling the composition of perfectivity in Russian. In contrast, a description-by-analysis syntax–semantics interface (Halvorsen & Kaplan 1988) would read the single perfectivity value in the f-structure and translate it into an appropriate logical expression for semantic composition.

Such an approach to the semantic contribution of atomic f-structure features may be compatible with a codescription approach to predicate saturation and scope relations. But we argue that it is preferable to sidestep this question altogether by acknowledging, with Stump (2001) and Sadler & Nordlinger (2006), that lexical-incremental approaches to morphology—of which the analysis of Russian verbs we sketch above is an example—are descriptively inferior to inferential-realizational approaches. In a Paradigm Function Morphology approach to Russian perfectivity, a word like *na-stra-yva-yet* (1c), rather than having the structure in (2), occupies a cell in a paradigm, along with a complete well-formed property set {CUMUL:+,ASP:impf,AGR:{PERS:3,NUM:sg}}. The form of the word is determined by realization rules applying in blocks based on the word's category and morphosyntactic properties. We assume that these property sets are translated to f-descriptions by an appropriate morphology–syntax interface (Sadler & Nordlinger 2004; Andrews 2005). The question of a word having multiple ASPECT specifications does not arise and, since the cell can also be associated directly with its semantic contribution, the issue of multiple aspectual meaning constructors does not arise if a codescription approach to the syntax–semantics interface is taken.

The properties of Russian perfectivity paradigms help shed light on LFG's projection architecture: a lexical-incremental m-structure is not compatible with a uniquely codescriptive syntax–semantics interface, but an inferential-realizational m-structure is neutral between codescription and description-by-analysis. We envision that further analysis of SP–stem co-occurrence restrictions—see for example Tolskaya (2007) on SPs compatible with verbs of motion—will have consequences for the relationship of morphology to semantics or lexical semantics.