Prefixation of Russian verbs of motion: a frame-based account

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In the context of verbal affixes and aspect in Russian, verbs of motion provide a particularly interesting domain of investigation (e.g., Isačenko, 1960; Forsyth, 1970; Dickey, 2010; Kagan, 2010, 2012). This class of verbs consists of a limited set of basic imperfective verbs which come in two forms: *determinate*, or (uni)directional, and *indeterminate*, or multi-/nondirectional. Examples are *idtí/xodít'* ('to walk'), *bežát'/bégat'* ('to run'), *letét'/letát'* ('to fly'), and *nestí/nosít'* ('to carry'). Verbs of motion can be combined with a wide range of verbal prefixes (Titelbaum, 1990), which give rise to perfective prefixed motion verbs. (Note that the seemingly exceptional cases of prefixed indeterminate motion verbs that are imperfective in turn can be analyzed as secondary imperfectives of the corresponding prefixed determinate verbs; cf. Titelbaum 1990; Janda 2010; Zinova & Osswald 2014.) In recent work on Russian prefixation, a distinction has been drawn between *lexical* and *superlexical* prefixation (Svenonius, 2004; Romanova, 2006; Tatevosov, 2009). The assumption is that in the first case, the prefixation extends or modifies the lexical meaning of the base verb, while in the second case, the semantic effect is primarily related to quantification, phase, or Aktionsart. Applied to verbs of motion, lexical prefixation basically comes down to the contribution of *spatial* information, that is, of information about moving towards a goal, away from a source, or along a path. Spatial prefixation applies to determinate motion verbs while indeterminate verbs tend to undergo non-spatial prefixations.

We propose a frame-semantic approach for modeling the difference between indeterminate and determinate motion verbs and the effect of prefixation on them. Following Kagan (2012), we attribute the difference between indeterminate and determinate verbs to the fact that the latter but not the former lexicalize a *path scale*. In our frame-semantic analysis, this will be represented as follows: Indeterminate motion verbs are characterized by the manner of motion they encode, which is represented by the value of a MANNER attribute. Since motion events come with a change of location by default, they are assumed to have a TRACE attribute, whose value represents the set of points in space traversed. The FORM of the trace can be accessed in expressions like 'run in circles', which in Russian requires the indeterminate verb plus a plural NP in instrumental case. The path component lexicalized by determinate motion verbs, on the other hand, introduces attributes for the specification of source, goal, and direction. Path structures provide a richer conceptualization than trace elements in terms of temporal ordering and directedness. Determinate motion events can thus be measured with respect to path and time, while indeterminate motion event may only be measured with respect to time. This analysis allows us to predict the ability of the verbs in question to be combined with accusative measure nominals of *time* and *path* types and the semantics of the resulting verb phrases.

We analyze the semantic contribution of a number of prefixes (*za-*, *po-*, *pri-*, and *pro-*) in terms of their effect on the frame-semantic representation of the base verb. In general, when prefixes with a spatial interpretation are combined with determinate mo-

tion verbs, the spatial meaning of the prefix is integrated with the directed motion semantics of the verb. This is the case for the prefixes *za-* ('behind', 'beyond'), *pri-* ('toward', 'up to'), and *pro-* ('through', 'past'), but not for *po-*, which has no spatial meaning (as a prefix) but indicates that the motion has started. Prefixations of indeterminate motion verbs, on the other hand, do not have a spatial interpretation but operate on the event structure associated with the base verb, by delimiting the event or changing the Aktionsart perspective (Filip, 2003; Braginsky, 2008; Kagan, 2012). The prefixation of indeterminate motion verbs by *po-* and *pro-* means 'for a short time' and 'for some time', respectively, and *za-* triggers an inchoative reading, and these interpretations are not restricted to the domain of motion verbs. The prefix *pri-*, by contrast, does not combine with indeterminate motion verbs.

For example, applying the prefix *pro-* to the imperfective determinate/indeterminate pair *bežat'/bégat'* ('to run') gives rise to the perfective verbs *probežát'* ('to run a certain distance or past something') and *probégat'* ('to run for a certain amount of time'), respectively. In our model, the semantic contribution of *pro-* is uniformly modelled by an underspecified frame which imposes a scalar measurement component on the frames of the base verbs. Formally, the semantic composition is realized by frame unification under constraints, which in turn is triggered by morphological and syntactic composition schemes (Kallmeyer & Osswald, 2013). This allows us to explain, among other things, why *probežát'*, in contrast to *bežát'*, is not compatible with accusative temporal measure nominals, and to clarify the argument/adjunct status of measure phrases (Fowler & Yadroff, 1993). At the close we sketch how our approach applies to other verbs that can be used in directed motion constructions such as *tanzevat'* ('to dance') and *tolkat'* ('to push').

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