Explaining meaning: The interplay of syntax, semantics, and pragmatics

Introduction Traditionally, one of the usages of the prefix *po-* (often called *delimitative* or *attenuative*) is associated with some characteristic of an event being lower than the expected value: an event lasting for a short period of time, a small quantity of the theme consumed, etc. According to Filip (2000, pp. 47–48) "[t]he prefix *po-* contributes to the verb the [. . .] meaning of a small quantity or a low degree relative to some expectation value, which is comparable to vague quantifiers like *a little, a few* and vague measure expressions like *a (relatively) small quantity / piece / extent of*."

(1) Ivan po-guljal po gorodu.
Ivan po-walk.PST.SG.M around town
'Ivan took a (short) walk around the town.'
= example (9c) in Filip 2000

(2) Ivan po-el jablok.
Ivan po-eat.PST.SG.M apple.PL.GEN
'Ivan ate some (not many) apples.'
= example (3) in Kagan 2015 (p. 46)

Although the observations about the low degree on some scale, associated with the discussed usage of the prefix *po-*, are commonly accepted and seem to be well established, examples like (3) do not support it, as there the same verb as in (2) is modified by an adverbial denoting a high degree.

(3) Kogda do stolicy ostavalos' tridcat' kilometrov, našël stolovuju i očen' plotno
when until capital was left thirty kilometers found canteen and very tight
po-el [. . .]
po-eat.PST.SG.M
'When I was about 30 km away from the capital, I found a canteen and had a very good meal [. . .]'

Anatolij Azol'skij. *Lopušok* (1998)

In addition, there are other usages of the prefix *po-* that are never associated with a 'low degree' component: e.g. a usage that is described by Švedova (1982, p. 365) as 'to complete the action denoted by the derivational base' that is encountered in such verbs as *poblagodarit'* 'to thank'. The distribution of the dilimitative and non-delimitative prefix usages over derivational bases and contexts has not been studied so far.

Proposal I propose to use underspecified semantics and probabilistic pragmatic modelling to explain intuitions about the delimitative nature of the prefix *po-* and account for the cases that seem exceptional from the traditional perspective. The general line goes the following way: the prefix *po-* makes the event denoted by the derivational base bounded. The boundaries are imposed by mapping the initial and the final stages of the event to some degrees on the relevant scale, but in case of the prefix *po-* these degrees are not specified by the prefix.

At the same time, most verbs can be prefixed with a range of prefixes. At the same time almost all prefixes are more restrictive with respect to the identification of the initial and final stages of the event than *po-*. I propose to explain the observed inference of 'low intensity' or

'short duration' of the *po*-prefixed verbs by competition between various perfective verbs derived from the same base.

Contributions of different prefixes Most prefixes impose stronger restrictions on the scale selection and contribute more information about the degrees associated with the initial and/or final stage of the event than *po-*: (1) the prefix *za-* necessarily connects the initial stage of the event with the minimum of the scale; (2) the prefix *do-* relates the final stage of the event to the maximum point on the scale; (3) the prefix *pere-* (in some of its usages) does both.

Consider the verb *zimovat'* 'to spend winter time'. Four prefixed verb derived from it are commonly used (more can be found in the dictionary, but not in the contemporary texts): (1) *pozimovat'* 'to spend some winter time' describes a finished event of staying in some particular place without imposing further restrictions on the start and the end of the stay; (2) *zazimovat'* 'to stay for the winter' establishes a connection between the start living somewhere and the beginning of the winter; (3) *dozimovat'* 'to spend the rest of the winter' fixes the end point of the stay to be the end of the winter; and (4) *perezimovat'* 'to spend the winter' relates both the start and the end points of the stay to the beginning and the end of the winter, respectively.

Pragmatic competition A natural assumption with respect to the events of spending winter time is to limit the number of situations a speaker may want to describe to four (Table 1): (1) spending one whole winter (t_1); (2) spending an initial part of the winter (t_2); (3) spending a final part of the winter (t_3); (4) spending some time of the winter without bounding the event duration to the duration of the winter (t_4).

	event start = winter start	event end = winter end
t_1	+	+
t_2	+	-
t_3	-	+
t_4	-	-

Table 1: The domain of terminated events related to spending the winter

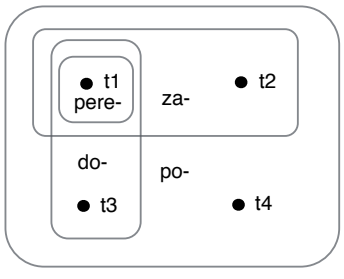

Figure 1: Possible interpretations of the verbs derived from *zimovat'* 'to spend the winter', see also Table 1

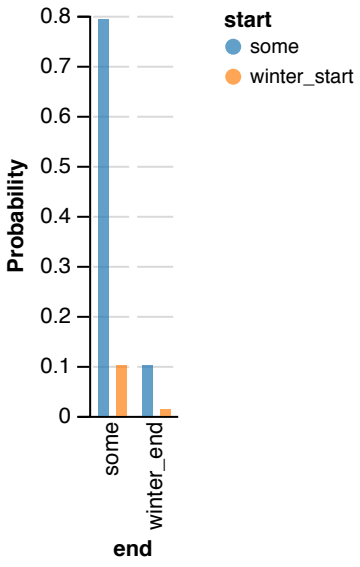

Figure 2: RSA model output

Given the situations specified in Table 1 and the restrictions imposed by particular prefixes, possible interpretations of prefixed verbs are shown on Figure 1: the verb *pozimovat'* 'to spend

some winter time' can refer to any of the situations t_1 –t_4, the verb *zazimovat'* 'to stay for the winter' can refer to t_1 and t_2, *dozimovat'* 'to spend the rest of the winter' – to t_1 and t_3, and *perezimovat'* 'to spend the winter' – only to t_1. In such a configuration, however, it follows from basic pragmatic and game-theoretic principles (one can use, e.g., Optimality Theory, see Blutner 2000) that the usage of the *za-*, *do-*, and *po-*prefixed verbs would be restricted to the situations t_2, t_3, and t_4, respectively.

Implementation: RSA framework As a further step, I propose to implement such an approach using the Rational Speech Act model (RSA, Goodman and Frank 2016). For the implementation I have used WebPPL with a basic three-layered RSA model (literal listener, pragmatic speaker, pragmatic listener); a world model with four states shown in Table 1 with a categorical distribution, a flat prior, a meaning function corresponding to the semantics described above, and the optimality parameter alpha 1. Given this model the verb *pozimovat'* is interpreted by a pragmatic listener as 'spend some but not all winter time' with the probability almost 0.8.

The influence of syntax Let us now consider examples (2) and (3). I claim that the difference in the interpretation of the verb *poest'* 'to eat' can be accounted for by using the same pragmatic principles as in the case of the verb *pozimovat'* 'to spend winter time'. The key idea here is that the number of available alternatives depends on the syntactic context: when an object if present, as in (2), the verb *poest'* 'to eat' competes with the verbs *naests'ja* 'to eat until becoming full' and *s"jest'* 'to eat all of smth' and thus acquires the enriched interpretation 'to eat but not all of something and not until becoming full'. In an intransitive context, however, there are no alternatives, as both *naests'ja* 'to eat until becoming full' and *s"jest'* 'to eat all of smth' are obligatory transitive. This results in the observed asymmetry of the interpretations.

Results Underspecified semantics coordinated with pragmatic competition allows to explain the observed inference of 'low intensity' or 'short duration' of the *po-*prefixed verbs by the competition between various perfective verbs derived from the same derivational base: when the semantics of several prefixed verbs overlaps, the usage of the *po-*prefixed verb gets restricted to the 'low degree' situations; when no such competition takes place (e.g. due to the restrictions on the type of the scale), the usage of the *po-*prefixed verb is not constrained further.

In sum, the combination of the underspecified semantics and basic pragmatics allows to deal with phenomena that have not received any explanation so far.

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