Measurement across Domains: A Unified Account of the Adjectival and the Verbal Attenuative *po*-

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Abstract: In the recent literature on gradable predicates, it has been argued that the notion of a differential degree (one that measures the distance between two values on a scale) plays a role in the semantics of both adjectival and verbal predicates. This paper provides further evidence in favor of this claim by putting forward a unified account of the prefix *po-* that attaches to Russian comparative adjectives/adverbs and the attenuative *po-* that combines with verbs. Building on Filip's (2000) and Součková's (2004a, b) analysis of the verbal *po-*, it is argued that *po-* is a single prefix whose function is to restrict the differential degree and which applies within the verbal, adjectival, and adverbial domains. In addition, this paper investigates the interaction of this prefix with verbs lexicalizing scales of different dimensions.

1. Introduction

In the recent linguistic literature, scalarity has been argued to play a significant role in both the verbal and the adjectival domains (cf., e.g., Kennedy 1999, 2001, 2007a, b; Kennedy and McNally 2005; Filip and Rothstein 2006; Sassoon 2007; Filip 2008; Kennedy and Levin 2002, 2008; Piñón 2008; Rappaport Hovav 2008, 2011, 2013; Kagan 2015; and references therein). Despite the apparent differences between the two domains, a broad range of scale-related notions and distinctions turn out to be relevant in both adjectival and verbal semantics, including, e.g., the standard of comparison, the contrast between open and closed scales, and the difference value.

The recent discoveries in this area allow a novel look at certain linguistic phenomena. A unified approach becomes possible to certain elements that have previously been treated separately because they occur in different categorial environments. One goal of this paper is to demonstrate such a synthesis by providing a unified analysis of the verbal attenuative prefix *po-* and the adjectival/adverbial comparative prefix *po-* in Russian. Consider the following two sentences:

(1)   a.   Dima   posidel   na   stule.
          Dima   po-sat   on   chair

          'Dima sat on a chair for a while.'

     b.   Petja   posil'nee   Borisa.
          Petja   po-stronger   Boris$_{GEN}$

          'Petja is somewhat stronger than Boris.'

In (1a), the prefix *po-* is attached to the verb *sidel* 'sat'. The prefix contributes a temporal meaning according to which the reported event took place for a relatively short while. Dima did not sit for a long time. In (1b), the prefix *po-* combines with the comparative adjective *sil'nee* 'stronger'. While the sentence without *po-* asserts that Petja is stronger than Boris, the prefix further specifies that the difference in strength is relatively small.

A certain semantic similarity between the two prefixes has been noted in the literature (e.g., Guiraud-Weber 2011, as well as Kirejceva 1990 and Knjazev 2009, as cited by Sičinava 2015). Both have been claimed to involve the semantics of smallness/desirability. However, to the best of my knowledge, the two prefixes have not been previously unified in the generative linguistic literature and have never received a uniform formal account. Note that, on the intuitive level, their functions seem to differ substantially. In (1a) we find a verbal prefix which contributes a temporal meaning. In contrast, the prefix observed in (1b) applies in the adjectival domain and has nothing to do with temporality, but rather interacts with comparative semantics. The fact that the two prefixes sound identical does not constitute particularly strong evidence for semantic unification: both Russian verbal prefixes and the prepositions from which they are derived are often considered to be many-way polysemous and even homonymous.

However, recent findings on the role of scalarity in the verbal domain and the role that differential degrees play in both verbal and adjectival semantics allow for the formal unification of the two prefixes under discussion. Below, I argue that (1a) and (1b) contain the same prefix *po-*, which applies to both adjectives and verbs and fulfills the same scalar function in both domains. I adopt the approach to verbal attenuative *po-* developed by Filip (2000) and Součková (2004a, b). I further provide a novel formal analysis of the adjectival/adverbial *po-*, formulated within the framework of degree semantics. Finally, I argue that the two items should be unified, since they fulfill the same scalar function in different domains. Thus, we are dealing with a single attenuative prefix *po-* for which I provide a uniform analysis. This approach contributes further evidence in favor of the linguistic relevance of scalarity in general and difference values in particular **across grammatical categories**.

The paper is organized as follows. Section 2 is devoted to a theoretical discussion of the notion of difference value, or differential degree. This notion

plays a central role in the proposed analysis. In section 3 I discuss in more detail the nature of scales that are invoked in the verbal domain and to which the verbal *po-* could potentially apply and introduce briefly the relevant properties of the Russian aspectual system. Section 4 is devoted to verbal attenuative *po-*. I present an approach to this prefix that is based on the analyses by Filip (2000) and Součková (2004a, b) and which treats *po-* as a degree modifier that delimits the degree of change. I also discuss certain differences between the distribution of *po-* in Czech and in Russian. The section further includes an investigation of the ways in which Russian *po-* interacts with stems that lexicalize different scale types. In section 5 the adjectival *po-* is introduced. I argue that this prefix delimits the difference value. Consequently, in section 6 I propose that the verbal attenuative *po-* and its adjectival counterpart should be unified under a single account. Section 7 discusses an additional use of adjectival *po-* that does not seem to carry attenuative semantics. A direction for unifying this use with the attenuative one is proposed, with the details being left for future research. Section 8 concludes the discussion.

2. The Difference Value in Linguistics

In the recent literature on scalarity, the notion of a differential degree (Kennedy 2001), or difference value (Kennedy and Levin 2002), has been argued to be linguistically relevant. For instance, consider the sentence in (2):

(2)   John is 5 cm taller than Bill.

The expression *5 cm* measures the difference between two degrees on the scale of tallness, the one that represents John's height and the one that corresponds to the height of Bill. Basically, this differential degree measures the distance between two points on a scale.

Using the notions of a difference value and degree addition (Kennedy and Levin 2002), the semantics of (2) can be represented as in (3). (The tense argument is added, as the height of a given individual may change with time. I assume that in (2) the time at which the individuals are mapped to the corresponding degrees of tallness is the time of the utterance.)

(3) $\text{TALL}(\text{john})(t_u) \geq \text{TALL}(\text{bill})(t_u) + d_5$

Note that *tall* is treated here as a function from individuals and times to degrees, e.g., for the individual John and time t it renders the maximal degree to which John is tall at t (this approach is taken in, e.g., Kennedy and Levin 2002). For an alternative formal approach to gradable adjectives, see, e.g., Heim 2000. In prose, (3) asserts that the height of John at the time of utterance is at least the height of Bill at the same time plus 5 cm.

The difference value can figure in the semantics of comparative adjectives even if it is not explicitly specified, as in (4). In such cases, it is existentially quantified over (5).

(4) John is taller than Bill.

(5) $\exists d \ [TALL(john)(t_u) \geq TALL(bill)(t_u) + d]$

There is a degree such that John's height at the utterance time equals (at least) Bill's height plus this degree.

Crucially, Kennedy and Levin (2002, 2008) further extend the relevance of differential degrees to the verbal domain. They introduce the notion of *verbs of gradual change*, which denote events that involve an increase in the degree to which their argument possesses a certain gradable property (Kennedy and Levin 2002: 5). For instance, these verbs include degree achievements, such as *cool*, *lengthen*, and *widen*. The internal argument of gradual change verbs is entailed to undergo a change in the course of the event. The change is of the following nature. At the beginning of the event, the argument possesses a certain gradable property (e.g., wideness) to a degree *d*. At the end of the event it comes to possess the same property to a higher degree *d'*. Thus, an increase along a scale is involved. The meaning of the verb *widen* can be then represented as in (6):

(6) $[[widen]] = \lambda d\lambda x\lambda e.[WIDE(x)(END(e)) \geq WIDE(x)(BEG(e)) + d]$

    where BEG is the function from events to times that returns an event's beginning point, and END is the function from events to times that returns an event's endpoint.

The degree to which the argument is wide at the end of the event equals or is greater than the degree to which it is wide at the beginning of the event plus *d*.

A more concise way to represent the semantics of such verbs is introduced by Kennedy and Levin (2008) and further extended in Kennedy (2012). For this purpose, **the measure of change function** is used, which measures the difference between the degrees to which the property characterizes an object at the endpoint of the event and at its beginning point. For instance, the semantics of the verb *widen* is represented in (7), where wide$_\Delta$ is a function that for an individual *x* and event *e* renders as the value the degree to which *x* has widened in the course of *e* (between its beginning and final point) (Kennedy 2012: 8).

(7) $[[widen]] = \lambda d\lambda x\lambda e.wide_\Delta(x)(e) \geq d$

d in both (6) and (7) constitutes the degree-of-change argument, i.e., this is the degree that represents the change undergone by the argument in the course of

the event. Crucially, it constitutes a special case of a difference value. It measures the distance between two degrees. The contrast between comparative adjectives and gradual-change verbs is that with the former the difference value typically represents the distance between two arguments,[1] and with the latter the distance between values that the same argument gets at different points of the event. But the semantics of both types of predicates involves a degree argument that represents the distance between two points on a scale.

One goal of this paper is to apply the theoretical developments discussed in this section to an investigation of the Russian attenuative/measure prefix *po-*. The verbal attenuative *po-* has received considerable attention in the generative linguistic literature (e.g., Filip 1999, 2000, Součková 2004a, b, Tatevosov 2007). Moreover, Součková (2004a, b), building on Filip's analysis, explicitly argues that this prefix delimits the degree-of-change argument of the event (in other words, the difference value). What has gone unnoticed in these analyses is the existence of the phonologically identical prefix *po-* that occurs with Russian comparative adjectives and adverbs. In what follows, I argue that we do not deal with homonymy or even polysemy in this case but rather with a single prefix *po-* which can attach to words of different categories (verbs, adjectives, and adverbs) and whose function is to delimit the difference value. I argue that its contribution in the adjectival and adverbial domain is exactly the same as in the verbal one, with the intuitive differences stemming from the (sometimes substantial) contrasts between the environments.

3. Verbal Semantics: Scalarity and Perfectivity

3.1. Scalarity in the Verbal Domain

The role of scale structure in the verbal domain has been investigated extensively in the recent literature (e.g., Hay, Kennedy, and Levin 1999; Kennedy and Levin 2002, 2008; Filip and Rothstein 2006; Filip 2008; Rappaport Hovav 2008, 2011, 2013; Piñón 2008; Caudal and Nicolas 2005; McNally 2011).

Kennedy and Levin (2002) divide verbs of gradual change into three groups. First, these include degree achievements, such as *widen*, discussed above. These predicates are associated with an increase in the degree on a **property scale**, the property being often contributed by the adjectival base, as the verbs in question are often derived from gradable adjectives. To illustrate, the verb *cool* denotes a change along a temperature scale, and the verb *darken*, an increase along a scale of darkness.

The second class are verbs of directed motion (e.g., *ascend* and *descend*), associated with an increase in the degree on a **path scale**, as they entail prog-

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[1] But this could also be a difference between degrees to which the same argument is mapped at different times.

ress along a path for one of their arguments. A path scale is a scale that orders locational points along a path in accordance with their remoteness from the source. A verb like *ascend* lexicalizes such a scale and denotes an increase along it (i.e., advancement along the path, away from the source).

The third class contains certain incremental-theme verbs, such as *eat*. These verbs are associated with an increase in the degree on the scale of **volume/spatial extent** associated with the object. For instance, an event of eating an apple involves larger and larger portions of an apple being consumed.

Importantly, with all these classes of verbs there is a homomorphic (one-to-one) mapping between the corresponding scale and the denoted events. Thus, there is a one-to-one mapping between parts of an event of ascending and parts of the path covered by the event participant that undergoes motion. Analogously, there is a homomorphic relation between the progress of a cooling event and the increase in the degree to which its argument possesses the property of coolness.

According to Kennedy and Levin (2002), the semantics of all these verb types, as discussed in the previous section, involves a degree-of-change argument (or a difference value). The approach is further developed by Kennedy and Levin (2008) for property scales and by Kennedy (2012) for volume/extent scales. As discussed above, the semantics of gradual-change verbs includes a degree-of-change argument (the difference value), which measures the change that an argument undergoes between the starting and the final points of the event.

Finally, Součková (2004a, b) further extends the linguistic relevance of degrees of change by proposing that the notion applies to time scales as well. The reasoning is as follows. Every event takes place in time. Therefore a time scale is in a certain sense always involved. Further, any durative event involves a change along a time scale: it begins at a certain point in time and ends at another, later (i.e., higher), point. Thus there is always an increase along a time scale, and as long as an event is bounded, this increase can be measured. Thus we can talk about events that lasted three minutes, two hours, five years, etc. Each of these values constitutes a degree on a time scale. This degree measures the change in time that took place in the course of the event. This way, the temporal duration of an event can be viewed as its degree of change on a time scale. Thus in (8) below the phrase *for eight hours* can be analyzed as a degree of change: it measures the distance between the starting and final points of the event along a time scale.[2]

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[2] The role of a time scale differs from those of the other kinds of scales mentioned above as far as telicity is concerned. In particular, delimitation along a time scale is not sufficient in order for a predicate to be telic (at least under most approaches to telicity). In the terminology used by Depraetere (1995), delimitation along a time scale results in boundedness but not telicity, whereas delimitation along scales of the other

(8) Jane slept for eight hours.

3.2. A Note on Russian Aspect

While this paper concentrates mainly on scalarity rather than specifically aspectual properties of verbal constituents, a brief note on Russian aspect and its relation to verbal prefixation is in order.

In Russian, every verb is morphologically specified for aspect, perfective or imperfective. The semantics of this aspectual distinction is a highly complex and controversial issue. Simplifying considerably for current purposes, we can state that perfective predicates denote delimited events—events that either reach their inherent natural endpoint or at least are temporally delimited. In contrast, the imperfective aspect lacks the delimitation entailment. It is compatible, for instance, with progressive and habitual readings. The perfective/imperfective opposition is illustrated in the minimal pair below:

(9) a. Dima   napisal   pis'ma.
         Dima   wrote$_{PERF}$ letters

         'Dima wrote the/some letters.'

     b. Dima   pisal   pis'ma.
         Dima   wrote$_{IMPF}$ letters

         'Dima was writing letters/used to write letters/wrote letters repeatedly.'

Example (9a), in which the verb is perfective, entails that Dima finished writing the contextually specified amount of letters. In other words, the reported writing event has reached its completion. In turn, (9b) does not carry such an entailment. It is compatible with a broader range of interpretations, including the progressive reading ('Dima was writing letters'), an iterative reading ('Dima wrote letters more than once'), as well as a habitual reading ('Dima used to write letters habitually'). Additional interpretations are possible, but further details will not be discussed here for reasons of space. The perfective/imperfective opposition has been treated in terms of the telic/atelic or total/partial (event) contrast (e.g., Krifka 1992; Filip 1999, 2000). Alternatively, the imperfective can be analyzed as a default aspect (cf., e.g., Jakobson 1957/1971; Kagan 2010).

As can be seen in (9), a verb often becomes perfective with the attachment of a prefix. However, the number of verbal prefixes in Russian is quite high

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three types does bring about telicity. However, for current purposes, time scales are as relevant as property, path, and volume scales.

and their function extends considerably beyond perfectivization.[3] Each prefix contributes its own meaning components. It is on the semantics of one such prefix, the attenuative *po-*, that I concentrate below.

4. The Verbal Attenuative Prefix *po-* in Slavic

Before we proceed to the investigation of the attenuative *po-* in Slavic, the following note about the prefix *po-* is in order. It is important to emphasize that the verbal *po-* has numerous uses in Slavic (or that some Slavic languages, including Russian, contain more than one verbal prefix *po-*). The range of meanings associated with this prefix in Russian is relatively wide. Typically, researchers distinguish between five or six interpretations. For instance, Šve-dova et al. (1982: 366–67) list five uses of *po-*: **low intensity** (e.g., *poosvobodit'sja* (PO-get-free) 'get a little bit freer'), **distributivity** (e.g., *pootkryvat' vse okna* (PO-open all windows) 'open all the windows one by one'), **short period** (e.g., *po-rabotat'* (PO-work) 'work for a (relatively) short while'), **inchoative** (e.g., *pobežat'* (PO-run) 'start running'), and **completive** (e.g., *postroit'* (PO-build) 'build (completely)'). The same submeanings are assumed by Dickey (2007), who proposes a detailed analysis of the diachronic development of the Russian *po-*. Out of these five uses only two (low intensity and short period, or *attenuatives* and *delimitatives* under the terminology used by Dickey) fall under the attenuative meaning discussed in the present paper.[4]

It is important to emphasize that it is not the goal of this paper to provide a uniform analysis of all the uses of the verbal *po-* in Russian. It is quite plausible that such an analysis is not desirable and the meanings are sufficiently different for a polysemy approach to be maintained. The polysemy approach is, for example, taken by Dickey, who states that "the meanings of the prefix *po-* form (and have formed) a family resemblance category" (2007: 329). The prefix is analyzed as having a cluster of meanings that are organized around a prototype. This kind of cognitive approach is also taken by LeBlanc (2010), who considers *po-* from a synchronic perspective. LeBlanc proposes that the meanings of *po-* should be grouped into two clusters and discusses the relations between the different submeanings.

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[3] For reasons not to analyze verbal prefixes as perfectivizers, see Isačenko 1960/2003, Filip 2000, Janda and Nesset 2010, and references therein.

[4] The sixth use, **intermittent-attenuative**, is found in such verbs as *pobrasyvat'* (PO-throw) 'throw off and on' and is always accompanied by the imperfectivizing suffix *-yva-*. Following Dickey (2007), I assume that this use does not represent a separate sense of the prefix. Rather, verbs that contain it involve a (probably compositional) combination of the meanings of the stem, the delimitative *po-*, and the imperfective suffix.

The present paper concentrates on attentuative/delimitative *po-*, associated with the 'low amount'/'low degree' meaning, and its relation to the attenuative *po-* found in the adjectival domain. The inchoative, completive, and distributive uses fall beyond the scope of the present research.

4.1. The Scalar Analysis

The attenuative prefix *po-* is found in Russian as well as in Czech. While its distribution in the two languages is not identical (as will be shown below), its semantic contribution is rather similar. As noted by Filip (2000: 47–48), who discusses the prefix in Russian, it "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*…." Several uses of *po-* are illustrated in (10) for Russian and in (11) for Czech (all the Czech examples are taken from Součková 2004a: 26):

(10) a. Ivan **po**guljal   po   gorodu.
          Ivan PO-walked around town

          'Ivan took a **(short)** walk around the town.'   (from Filip 2000: 47)

      b. Dima **po**el   jablok.
          Dima PO-ate apples$_{GEN}$

          'Dima ate **some (not many)** apples.'

      c. Petja **po**uspokoilsja.
          Petja PO-calmed-down

          'Petja calmed down **a little**.'

(11) a. Řidič   trochu **po**pojel,[5]   aby   nám nestál   v   cestě.
          driver a-bit   PO-PO-drove so-that us   not-stood in   way

          'The driver moved on **a bit** so that he didn't stand in our way.'

      b. Ester svou výpověď   **po**změnila.
          Ester own   testimony PO-changed

          'Ester changed her testimony **a little**.'

      c. Jakub o   tom **po**přemýšlel.
          Jakub about it   PO-thought

          'Jakub thought about it **for a little while**.'

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[5] See Součková 2004a: 27–29 for a possible explanation of why the verb contains a double *po-*.

In (10a) and (11c), *po-* contributes the meaning component of a relatively short while (the walk and the thinking process, respectively, did not last for a long time). In (10b) it restricts the quantity of apples consumed to not very large. Example (10c) specifies that the subject did not calm down fully, but rather became slightly calmer than he had been prior to the reported event. Analogously, in (11b), *po-* makes sure that the change in question is relatively small. Finally, in (11a), it specifies that the path covered by the driver is relatively short.

Filip analyzes the Russian *po-* as an extensive-measure function, which "[carves] out a chunk of a certain size out of the extension of a base process verb" (2000: 62). The prefix measures out an event by virtue of measuring an argument whose part structure stands in a homomorphic relation to that of the event or by measuring the temporal trace of the event (events and times standing in a relation of homomorphism, too). For instance, in (10b) there is a one-to-one mapping between parts of the eating event and parts of the apples that are being consumed (Krifka 1992, 1998; Filip 2000). The prefix delimits (vaguely) the quantity of consumed apples by specifying that the quantity is relatively small (or at least not large). As a result, it also delimits the eating event. The formal analysis of *po-* proposed by Filip is the following:

(12) $[[\text{po-}]] = \lambda P \lambda x \, [P(x) \wedge m_c(x) \leq s_c]$

   where m_c is a free variable over measure functions that are linguistically or contextually specified, and s_c stands for a contextually determined expectation value.

Součková (2004a, b) largely follows Filip (2000) in the analysis she provides for *po-* (although she concentrates on *po-* in Czech). Crucially, she explicitly treats the prefix as delimiting, or measuring, an interval on a scale. More precisely, she claims that *po-* delimits an event by delimiting its degree-of-change argument, or the difference value. It does so by specifying that the degree-of-change does not exceed some contextually specified expectation value. As for the dimension of the scale on which the degree of change is measured, it depends on the verbal predicate. With verbs of gradual change, the prefix will apply to the scale that is contributed by the predicate. For instance, in (10c), it applies to the scale of calmness lexicalized by the verb and in (11a), to the path scale, which is, again, contributed by the verbal stem.

Importantly, with predicates that do not belong to the class of verbs of gradual change, the prefix applies to a time scale. To illustrate, *po-* applies to a time scale in (10a) and (11c). By delimiting an interval on this scale (specifying that it is relatively short), the prefix delimits the event.

Součková proposes that, in all its uses *po-* measures an event by virtue of measuring the degree of change. The semantics of this prefix can be represented as in (13) (taken from Kagan 2015: 47):

(13) $[[\text{po-}]] = \lambda P \lambda d \lambda x \lambda e.[P(d)(x)(e) \wedge d \leq d_c]$

where d is the degree-of-change argument of the event, in the sense of Kennedy and Levin (2002), and d_c is the contextually supplied expectation value.

Roughly, *po-* looks for a predicate that takes a degree, an individual, and an event argument and imposes the '$\leq$' relation between the degree argument and the contextually provided expectation value d_c.

Thus, under the Filip-Součková approach, *po-* can be conceptualized as imposing a relation between two degrees on a scale: the degree of change and a degree corresponding to a contextually specified standard. This demonstrates that the semantics of *po-* supports the Scale Hypothesis (Kagan 2011, 2012, 2013, 2015) according to which Russian verbal prefixes constitute degree modifiers which impose a relation between two degrees.

To illustrate, the compositional semantics of the verb *pouspokoit'sja* (po-calm-down) 'calm down a little', illustrated in (10c), is provided in (14).

(14)   a. $[[\text{uspokoit'sja}]] = \lambda d \lambda x \lambda e.\text{calm}_\triangle(x)(e) = d^6$

b. $[[\text{po-}]] = \lambda P \lambda d \lambda x \lambda e.[P(d)(x)(e) \wedge d \leq d_c]$

c. $[[\text{pouspokoit'sja}]] = [[\text{po-}]]([[\text{uspokoilsja}]]) = \lambda d \lambda x \lambda e.[\text{calm}_\triangle(x)(e) = d \wedge d \leq d_c]$

The original verb denotes a set of events of change along the scale of calmness, as shown in (14a). In the course of these events, the calmness of the individual argument increases, and *d* represents the difference between the degrees to which the argument in mapped at the beginning and at the end of the event. Due to the presence of *po-*, the verb *pouspokoit'sja*, shown in (14c), further specifies that the degree of change *d* does not exceed the contextually specified standard d_c.

4.2. Attenuative *po-* with Different Scale Dimensions

Before turning to the adjectival prefix *po-*, it is worth discussing the interaction of its verbal counterpart with different scale dimensions. It turns out that *po-* exhibits somewhat different behavior in Czech than it does in Russian, as far

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[6] Under Kennedy and Levin's approach, the formula would look as follows:

(i) $\lambda d \lambda x \lambda e.\text{calm}_\triangle(x)(e) \geq d$

However, in order to capture the semantics of *po-*, it is essential to relate to the *maximal* degree that corresponds to the change undergone in the course of the event. Assuming that the difference value (and more specifically, the degree of change) constitutes such a maximal degree, the relation '$\geq$' can be substituted by one of identity.

as the choice of scale dimension is concerned. As stated above, Součková, who analyzes the Czech data, makes the following generalization. If the verb is a verb of gradual change whose stem lexicalizes a scale, it is to this scale that the prefix will apply. This can be a path scale or a property scale; the application of the prefix to volume scales is highly limited. If the stem does not lexicalize a scale, then the prefix applies to a time scale, which is always available in a sentence. (Presumably, this scale is contributed at a higher structural level, i.e., in the AspP or TP area.) In this case, the event gets delimited temporally, and the 'for a short while' reading results.

The case in Russian turns out to be somewhat different, however. The facts are complex, intuitions of native speakers are not always clear, and variation across both individual speakers and individual verbs is observed. The remainder of this subsection is devoted to an investigation of this issue. Then in section 5 we turn to adjectival *po-*.

4.2.1. Facts and Complications

Let us consider the combination of Russian verbal *po-* with different scale types. Firstly, it can be stated that this prefix is used quite productively with those verbs that do not seem to lexicalize any scale, in which case it is natural for a prefix to apply to a scale of time (cf., e.g., Součková 2004a, b; Kagan 2015). With such verbs, the prefix contributes the meaning component of a relatively short duration (or at least duration that does not exceed an expected value). Examples include such verbs as *posidet'* 'sit for a while', *poležat'* 'lie for a while', *pospat'* 'sleep for a while', *poguljat'* 'walk for a while', *poigrat'* 'play for a while', *porabotat'* 'work for a while', etc.

Secondly, in Russian *po-* does not generally apply to a path scale. Verbs that lexicalize such scales are mainly determinate verbs of motion, such as *idti* 'walk', *plyt'* 'swim', *bežat'* 'run', etc. With these verbs, *po-* only receives the inchoative reading, e.g., *poplyt'* (ʀo-swim) means 'start swimming'. Attenuative *po-* is not found with these predicates and thus does not apply to the path scales they contribute.[7]

The situation, however, is more complicated as far as volume/extent and property scales are concerned. Attenuative *po-* does combine with some verbs that lexicalize such scales, but not as productively as with atelic verbs, with which only a temporal meaning is available. For instance, with many verbs

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[7] Attentuative *po-* does combine with **nondeterminate** verbs of motion, such as *xodit'* 'walk (around)' and *begat'* 'run (around)'. However, the resulting meaning is temporal, e.g., *poxodit'* 'walk for a while'. Here the prefix does not apply to a path scale either. In fact, it appears that with nondeterminate verbs, prefixes systematically do NOT receive spatial meanings (cf., e.g., Romanova 2006, Braginsky 2008) and thus do not apply to path scales. Kagan (2015) argues that nondeterminate verbs of motion do not lexicalize path scales, which results in this shift in prefixal interpretation.

associated with a volume scale contributed by their object, *po-* receives a resultative meaning, not the attenuative one. Examples include: *pokrasit'* (PO-paint) 'paint', *pomyt'* (PO-wash) 'wash', *počinit'* (PO-fix) 'fix', *počistit'* (PO-clean) 'clean', etc. All these verbs denote completed events of the kind lexicalized by the stem. Thus, it is worth noting that attenuative *po-* is relatively reluctant to combine with predicates that lexicalize volume scales. With verbs that lexicalize property scales, restrictions are found as well. With some such verbs, *po-* cannot combine; for example, we do not get a verb **pozret'* (PO-ripen). With others, *po-* does not receive an attenuative meaning, but rather one of entering a state denoted by the stem. For instance, *pomračnet'* (PO-get.gloomy) means 'become gloomy', and *poxolodat'* (PO-turn.cold), 'become cold' (about the weather). These verbs provide no information regarding the degree to which the corresponding state holds or regarding its duration. The delimitative component is absent. And while attenuative *po-* does combine with some other stems that lexicalize property scales, we will see below that not all speakers find the resulting prefixed verbs acceptable.

Still, we do get such verbs as *posušit'* (PO-dry) 'dry for a while', which lexicalizes a property scale, and *poest'* (PO-eat) 'eat', with which a volume scale is often invoked. A question that emerges is which scale the prefix interacts with in such instances. Does it choose the scale lexicalized by the predicate, or a time scale? The answer is often not at all trivial. To illustrate, it is not easy to determine whether in the phrase *poest' jablok* (PO-eat apples) 'eat some apples', *po-* specifies that a relatively small amount of apples is consumed or that the eating event takes place for a relatively short time. The confusion is related to the fact that progress along one scale is often accompanied by progress along the other. For instance, the longer the eating event, the greater number of apples is likely to be consumed. Homomorphism is not obligatory in this case (e.g., one can eat a single apple very slowly), but the correlation is rather strong.

I have used two sources in order to investigate the nature of delimitation that *po-*contributes with such verbs. First, I looked up the definitions provided for a range of *po-*verbs in several dictionaries. Second, I collected native speaker judgments by distributing two questionnaires. Results obtained from these two sources are not always identical. Therefore, I begin below by summarizing the facts that follow from what is asserted in the dictionaries (section 4.2.2) and then turn to the questionnaires and the results obtained (section 4.2.3). I will then provide a brief summary of the complex facts and draw certain general conclusions.

4.2.2. Dictionary Definitions

If we concentrate on verb meanings as defined in dictionaries, it can be concluded that attenuative *po-*, when found with predicates lexicalizing volume

and property scales, normally contributes **temporal** meanings. In other words, it ignores the scale contributed by the predicate and applies a time scale instead.

In my research I have used the Academic website (http://dic.academic.ru/), which makes it possible to conduct a simultaneous search in a wide range of Russian dictionaries. The specific dictionaries whose entries have been considered include online versions of Ušakov's *Tolkovyj slovar' russkogo jazyka*, Ožegov's *Tolkovyj slovar' russkogo jazyka*, Dal''s *Tolkovyj slovar' živogo velikorusskogo jazyka*, Efremova's *Sovremennyj tolkovyj slovar' russkogo jazyka*, the small (four-volume) Academy dictionary, and the Encyclopedic Dictionary). Not all the verbs mentioned below appear in all these dictionaries. However, each appears in at least three of the sources.

Typically, the attenuative meaning specified for *po*-verbs that are associated with property and volume scales (in those cases when the verbs have such a meaning at all) is specified as temporal. To illustrate, here are several definitions of the attenuative *posušit'* (po-dry):

> V tečenie nekotorogo vremeni soveršit' dejstvie, nazvannoe sootvetst-vujuščim besprefiksnym glagolom.
>
> 'Perform the action named by the corresponding unprefixed verb for a certain while.'   Efremova

> Podvergnut' nenadolgo suške.
>
> 'Cause to undergo drying for a short while'.   Ušakov

> Sušit' nekotoroe vremja.
>
> 'Dry for a certain while.'   Encyclopedic Dictionary

It can be seen that the definitions clearly relate to the component of temporal delimitation. A similar state of affairs is found with such verbs as *posoxnut'* 'dry for a while' (intransitive), *pogret'* 'heat for a while', *pokipjatit'* 'boil for a while', *pomoknut'* 'be sodden for a while', *polečit'* 'treat (a patient) for a while', *povarit'* 'cook for a while',[8] which lexicalize property scales, as well as with *počitat'* 'read for a while', *pošit'* 'sew for a while', and *porisovat'* 'draw for a while', associated with volume scales. In all these cases, the prefix seems to ignore the scale contributed by the predicate, applying to a time scale instead. (Some of these verbs receive nonattenuative meanings as well.) Among pred-

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[8] The fact that this verb at least optionally contributes a property scale is revealed by its combination with certain prefixes. For instance, *perevarit'* (pere-cook) means 'overcook', and *nedovarit'* (nedo-cook), 'undercook'. In both cases, a prefix applies to the scale of doneness and provides information regarding the degree to which the dish is cooked.

icates that come with a volume scale, *poest'* (po-eat) is different. If interpreted attenuatively, it is linked to a volume scale (eat a little), and not to a time scale.

The verb *pognit'* (po-rot), which lexicalizes a property scale, constitutes an interesting case since in Ušakov's dictionary it is assigned two attenuative meanings: undergoing rotting for a while (time scale) and getting rotten partly (volume scale). In other dictionaries this verb, if found at all, does not receive an attenuative meaning, but rather a resultative one (which is also the third meaning assigned to it in Ušakov). The verb thus seems to be associated with a resultative meaning much more strongly than with an attenuative one. But in the latter case delimitation along both a time and a volume scale seems to be possible.

To sum up thus far, we observe a strong bias for temporal meanings as long as an attenuative interpretation is available.

However, the case is totally different when *po-* attaches to verbs **which are perfective to begin with**. When the stem is perfective, attenuative *po-* does not contribute temporal delimitation, but rather specifies that the change undergone by the argument is relatively small. This is what happens with such verbs as *pouspokoit'sja* (po-get calm) 'get somewhat calmer', *poostyt'* (po-cool down) 'get somewhat cooler/calmer', and *pootstat'* (po-fall behind) 'to fall behind somewhat'. For instance, *pouspokoit'sja* does not mean that the argument is calming down for a short while, but rather that (s)he calms down somewhat, but not completely, not to the maximal degree. Delimitation here is along the property scale. The same holds for *poostyt'* 'get somewhat cooler/calmer'. With *pootstat'* 'to fall behind somewhat', the case is similar, but interestingly, here *po-* does seem to apply to a path scale, again contributed by the stem. It contributes the 'short distance' meaning.

Why does *po-* not contribute temporal delimitation with these verbs? This, I believe, is due to the fact that the verbs denote an event of change **that is already delimited** at the point when the stem combines with the prefix. (Recall that in Slavic, perfective predicates denote delimited events.) The degree of change is understood to be bounded, even though the precise boundary may not be specified. For instance, *ostyt'* 'cool down$_{PERF}$' denotes a set of events of cooling down whereby the change in the temperature is bounded, although the precise degree of change or final temperature is to be determined contextually. Given this state of affairs, *po-* cannot provide the event with an additional boundary by delimiting its temporal duration, due to the "one delimitation per event" constraint, which says that a given event can be delimited at most once (cf., e.g., Tenny 1994; Filip 2003). Roughly, a boundary on the cooling event has already been imposed; the stem comes with this boundary present on the property scale. The prefix cannot now move on to a different scale and impose another, separate boundary there. Then what function can it fulfill?

As discussed in detail by Součková (2004a) for other analogous cases, the only thing that *po-* can do in such a situation is specify further information

about the event limit that has already been introduced. In our case, this is a limit on a property scale. The prefix specifies that the (already bounded) degree to which an argument has undergone a change is relatively low, or at least not higher than a certain standard.

In such instances attenuative *po-* applies to property (or even path) scales in a last resort-like manner, when its application to a time scale is ruled out by more general principles. Otherwise, the prefix prefers to apply to a time scale.

4.2.3. Questionnaires

In order to determine speaker intuitions, two questionnaires were distributed to native speakers of Russian. Both questionnaires consisted of multiple choice questions. In Questionnaire 1, the subjects were explicitly asked to determine the meanings of *po*-verbs. Each question contained a *po*-verb, a sentence with this verb (kept as simple as possible), and several answers concerning the meaning of the verb. The first variant corresponded to a temporal delimitation meaning, the second to delimitation along the scale lexicalized by the verb/VP (property or volume scale). Alternatively, the speakers could specify that they find it hard to choose between these two variants, that they dislike the verb altogether, or that its meaning differs from either of the two variants. In the last case, they were asked to provide their own answer. A sample question (translated into English) is provided in (15):

(15)   posoxnut' 'po-dry'

   Example:

      Bel'e   posoxlo   na   solnce.
      linen   po-dried   on   sun

      'The linen po-dried in the sun.'[9]

   a.   dry for a (not very long) while

   b.   dry but not completely

   c.   I find it hard to choose between the first and the second variant.

   d.   a different meaning (provide your answer)

   e.   I don't like this verb at all.

---

[9] I keep the translation neutral regarding the contribution made by *po-* in this subsection, since it is precisely to the investigation of this contribution that the questionnaires were devoted.

The order of questions was randomized and varied from subject to subject. Each question was answered by between 198 and 201 speakers.

Questionnaire 2 consisted of sentences that contained *po*-verbs, sometimes followed by an additional sentence that supplied a context. In each example additional wording made it clear either that the event lasted for a long time or that in its course a high degree of the property or volume scale was achieved. The speakers were asked whether they found the sentence acceptable. Three answer variants were provided: "acceptable," "unacceptable," and "I find it difficult to answer." Several examples are illustrated in (16):

(16) a. Bel'e   očen' dolgo   posoxlo   na   verevke.
          linen   very   long   po-dried on   line

          'The linen po-dried on the line for a very long while.'

      b. Bel'e   posoxlo   na verevke, i   v   itoge   vysoxlo.
          linen   po-dried   on line   and in result dried

          'The linen po-dried on the line, and in the end became completely dry.'

      c. Včera   ja počitala stat'ju. Potratila na èto ujmu časov.
          yesterday I   po-read   article   spent   on this lot   hours

          'Yesterday I po-read an article. I spent many hours on it.'

      d. Včera   ja počitala stat'ju. Pročla ee   ot   načala
          yesterday I   po-read   article   read   her from   beginning

          do   konca.
          till end

          'Yesterday I po-read an article. I read it from beginning to end.'

Again, the order of questions was randomized and varied from subject to subject. Each question was answered by between 236 and 239 speakers.

In order for the process of answering one questionnaire not to affect the intuitions regarding the second one, each questionnaire was given to different speakers.

4.2.3.1. Questionnaire 1

Let us begin with conclusions that can be drawn from the answers to Questionnaire 1. The results are summarized in Table 1. Note that in the last three verbs, *po-* occurs with a perfective stem.

Table 1.[10] Questionnaire 1 Results

Verb	Temporal Meaning	Property/ Volume Scale Meaning	Difficult to Choose	Different Meaning	Dislike
pomoknut' (po-become.wet)	47%	23%	5%	7%	19%
posoxnut' (po-dry)	41%	24%	2%	12%	21%
posušit' (po-dry, transitive)	57%	19%	6%	7%	9%
pognit' (po-rot)	27%	48%	3%	3%	20%
povyjasnjat' (po-figure.out)	38%	15%	3%	12%	31%
pogret' (po-heat)	37%	37%	5%	14%	8%
polečit' (po-treat)	38%	39%	9%	6%	9%
počitat' (po-read)	45%	25%	7%	18%	6%
porisovat' (po-draw)	56%	22%	5%	9%	9%
poest' (po-eat)	34%	30%	6%	22%	7%
poostyt' (po-cool)	3%	65%	1%	6%	25%
pouspokoit'sja (po-calm.down)	6%	61%	0%	3%	28%
poosvobodit'sja (po-get.free)	2%	34%	1%	2%	52%

It can be seen that the answers are far from uniform. However, several generalizations can be made:

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[10] The questions on the verbs *pouspokoit'sja* (po-calm.down) and *poosvobodit'sja* (po-get. free) contained an extra variant in which *po-* measures the time of the result state ('calm down for a short while' and 'become free for a short while', respectively). These variants were selected by 1% and 10% of the speakers, respectively.

1. **A considerable number of speakers dislike property-scale verbs with attenuative *po-*.** For verbs in which the prefix attaches to an imperfective stem, the dislike rate is between 8% and 31%. *Pomoknut',* for example, was disliked by 19% of the respondents, and *posoxnut'* by 21%. In fact, the number of subjects who found the verbs unacceptable is in some cases even higher. Speakers who selected variant (d) and specified that the meaning of a given verb differed from what was proposed in the questionnaire sometimes provided a nonattenuative meaning instead. For instance, 12% of the respondents chose the (d) answer for *posoxnut',* and many of them suggested instead a resultative meaning 'dry completely'. We can conclude that these respondents do not accept the verb with attenuative *po-*.

   When the prefix was attached to a perfective stem, the portion of speakers who chose the "dislike" variant was very high, between 25% and 52%, i.e., between a quarter and a half of the respondents. We can hypothesize that this has to do with the inability of *po-* to apply to a time scale with these predicates.

Further, for those speakers who did accept the verbs provided in the questionnaire, the following judgments can be reported:

2. **When *po-* attaches to an imperfective stem, the temporal interpretation is clearly preferred for six verbs out of ten**, specifically, *pomoknut'* (po-become.wet), *posoxnut'* (po-dry, intransitive), *posušit'* (po-dry, transitive), *povyjasnjat'* (po-figure.out), *počitat'* (po-read), and *porisovat'* (po-draw). **For three verbs, the temporal and the alternative (property or volume) delimitation was selected by approximately the same portion of the subjects.** This is the state of affairs with *poest'* (po-eat), *polečit'* (po-cure), and *pogret'* (po-heat). Finally, with one verb, *pognit'* (po-rot), the property-oriented interpretation was preferred over the temporal one. Recall that this verb was special as far as dictionary definitions were concerned as well: it is the only one in our sample for which a nontemporal attenuative interpretation was provided in at least one dictionary. In general, we can conclude that for the verbs in question, the temporal meaning tends to be preferred, but the property/volume meaning should not be neglected either.

3. **When *po-* attaches to a perfective stem, the temporal interpretation is essentially impossible.** Rather, (for those speakers who accept the verbs) the prefix applies to the property scale contributed by the stem. This conforms to the generalizations made about such verbs in the previous subsection.

4.2.3.2. Questionnaire 2

Let us now turn to the second questionnaire. Here too we find considerable variation in judgments. Table 2 below summarizes the results obtained for the illustrative examples in (16).

Table 2. Questionnaire 2, Illustrative Examples

Sentence	Acceptable	Unacceptable	Uncertain
16a	4%	95%	1%
16b	48%	45%	6%
16c	34%	59%	8%
16d	42%	51%	7%

The only type of sentence that the subjects appear to have agreed on are those like (16a) above, in which a *po*-verb combines with the expression *očen' dolgo* 'for a very long while'. Such sentences were found to be unacceptable by between 90% and 96% of the respondents. This reveals a strong association between attenuative *po-* and temporal delimitation.

In the other examples, as illustrated in (16b–d), the event was linked to a high degree on some scale via the context, specified in an additional clause or in an adjoined VP. Here, the results are more or less the same for time scales and property/volume scales. Judgments vary quite considerably, and the sentences were judged to be unacceptable by between 35% and 59% of the subjects.[11] In other words, a substantial portion of the respondents (even though not always the majority) disliked attenuative *po-* in contexts where the event either lasts for a long time or reaches a high degree along a property or volume scale. This suggests that *po*-verbs are associated with delimitation along both the time scale and the scale lexicalized by the predicate.

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[11] An exception is (i), in which the verb *pogret'* (PO-heat) appears in a context specifying that a high degree of temperature is reached. This sentence was found to be unacceptable by only 20% of the respondents, while 76% considered it acceptable. Thus, for the majority of the speakers, the presence of *po-* does not indicate delimitation along the property scale.

(i) Ja pogrela   v   mikrovolnovke boršč, i   on stal   očen' gorjačim.
    I   PO-heated in microwave   borsch and it became   very hot

   'I heated the borsch in the microwave, and it became very hot.'

4.2.4. Russian Attenuative *po-* with Different Scale Types: Conclusions

It may seem on the basis of the above discussion that the facts concerning attenuative *po-* and its interaction with scales of different dimensions are confusing and nonsystematic. Dictionaries provide a picture that is much more uniform than the results of the questionnaires. Further, there is considerable variation among individual speakers and individual verbs. In fact, however, several generalizations can be made which shed light on the semantics of attenuative *po-*:

1. **Attenuative *po-* attaches most productively to verbs that do not lexicalize any scale and with which, consequently, the temporal interpretation is most readily available.** With verbs that contribute path scales, *po-* generally receives an inchoative meaning.[12] With verbs associated with volume and property scales, *po-* often gets a resultative meaning or is in general unacceptable. And even in those cases when such verbs do combine with attenuative *po-*, not all speakers find the resulting predicates acceptable.

2. **Attenuative *po-* is incompatible with the expression *očen' dolgo* 'for a very long while'.**

3. **When found with verbs that lexicalize volume or property scales, attenuative *po-* exhibits a certain preference for temporal readings.** Generally, only such readings are given in the dictionaries.[13] Further, when speakers are asked to determine the meaning of such verbs, they tend to prefer temporal interpretations or at least to rank these interpretations as high as the alternative ones. (Verbs with perfective stems are special and will be discussed below.)

The generalizations in (1–3) reveal that **Russian attenuative *po-* exhibits a strong bias towards a temporal interpretation**, i.e., one of delimitation along a time scale. At the same time, this type of interpretation is not the only one available, as noted in the following:

4. **With perfective stems lexicalizing a property scale, attenuative *po-* contributes delimitation along the scale provided by the stem.** This follows from both dictionary definitions and answers to Questionnaire 1. Thus, when a temporal interpretation is impossible (for reasons dis-

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[12] There are some exceptions, e.g., *pootstat'* (po-fall behind) 'fall somewhat behind', discussed above.

[13] I concentrate here only on attenuative/delimitative meanings.

cussed above), a property-based meaning becomes available. (But still, many speakers dislike the resulting verbs.)

5. **With some imperfective stems lexicalizing property scales or volume scales, attenuative *po-* is associated with delimitation along these scales (and not only with temporal delimitation) for a significant portion of the informants.** This is seen in answers to both Questionnaire 1 and Questionnaire 2.

Thus the prefix under discussion "prefers" time scales but can apply to other scales at least for some speakers or with those verbs with which a temporal interpretation is ruled out for independent reasons. I believe that this kind of ambivalence can be accounted for in the following way. The original interpretation of attenuative *po-* is temporal. After all, the prefix *po-* used to have temporal semantics already in Old Russian (cf., e.g., Dickey 2007). However, with stems that lexicalize a different scale (e.g., one of property), temporal delimitation often goes hand in hand with delimitation along the additional scale. If the duration of an event is short, then progress along the lexicalized scale is likely to be relatively small too (cf. section 4.2.1). As a result, the two delimitation types became interrelated, and delimitation along the scale lexicalized by the verb got reanalyzed as part of the contribution of *po-*, at least for some speakers. At the same time, the original temporal interpretation remains dominant.

Having discussed the subtle nuances of the verbal attenuative *po-* in Russian, let us turn to its adjectival counterpart.

5. *po-* with Comparative Adjectives and Adverbs

Under the analysis proposed by Součková, the prefix *po-* measures a degree of change. In this section I bring new evidence in favor of this approach, which comes from the properties of a phonologically identical prefix that attaches to comparative adjectives and adverbs. I develop a scalar analysis of the comparative *po-* which treats this prefix as a measure function that delimits a difference value. Then in section 6 I propose that the two types of delimiting *po-* constitute instances of the same prefix in different environments and should be given a unified account.

5.1. *po-* Measures the Difference Value

In Russian a prefix *po-* can be attached to adjectives and adverbs in the comparative form. The attachment of this prefix is illustrated in Table 3.

Table 3. The adjectival/adverbial *po-*

Default Form	Comparative Form	*po-* Attached
umnyj 'clever'	*umnee* 'cleverer'	*poumnee* 'somewhat cleverer'
vysokij 'tall/high'	*vyše* 'taller/higher'	*povyše* 'somewhat taller/higher'
bol'šoj 'big'	*bol'še* 'bigger/more'	*pobol'še* 'somewhat bigger/more'
bystro 'quickly'	*bystree* 'more quickly'	*pobystree* 'somewhat more quickly'
daleko 'far'	*dal'še* 'farther'	*podal'še* 'somewhat farther'

Below, I concentrate on the semantics of the comparative *po-* when it attaches to adjectives. I assume this analysis can also be extended to adverbs.

The attachment of the prefix to a comparative adjective often results, intuitively, in the meaning 'somewhat more P', where P is the gradable property introduced by the adjective.[14] Consider the pair of sentences in (17).

(17) a. Kolja   vyše   Leny.
      Kolja$_{NOM}$ taller   Lena$_{GEN}$
      'Kolja is taller than Lena.'

     b. Kolja   povyše   Leny.
      Kolja$_{NOM}$ ро-taller   Lena$_{GEN}$
      'Kolja is somewhat taller than Lena.'

The meaning of (17a), which contains an adjective in the comparative form, can be formally represented as follows (assuming Kennedy and Levin's 2002 analysis of comparative adjectives in terms of degree addition):

(18) $\exists d \,[\text{TALL}(kolja)(t_u) = \text{TALL}(lena)(t_u) + d]$[15]

d in (18) is the difference value, the difference in the degree to which Kolja and Lena have the property of tallness.

Example (17b) entails (17a), i.e., it entails that Kolja is characterized by a higher degree of tallness than Lena, but it further specifies the difference

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[14] An additional interpretation is possible in some cases, as will be discussed in section 7.

[15] Again, under Kennedy and Levin's approach, the formula would involve the '≥', rather than identity, relation:

(i) $\exists d \,[\text{tall}(kolja)(t_u) \geq \text{tall}(lena)(t_u) + d]$

However, just as within the verbal domain, in order to capture the restrictive semantics of *po-*, it is essential to treat the differential degree as the *maximal* one, and therefore the identity relation is appropriate.

value as being relatively small. In other words, the contrast in tallness between the two individuals is asserted not to be very big. Thus the function of *po-* is to specify that the difference value is not higher than some contextually specified expectation value.

This view is supported by the compatibility of *po-* with adverbs that explicitly measure the difference value. The prefix can co-occur with such an adverb but can only do so as long as the adverb also specifies that the degree is relatively low. If, on the other hand, the adverb contributes an entailment that the difference value is high, as is the case with, e.g., *namnogo* 'much' in (19), then *po-* is unacceptable.

(19) Kolja   nemnogo/ neskol'ko/ #namnogo/ #gorazdo
      Kolja$_{NOM}$ a-little-bit somewhat   much   considerably

      povyše   Leny.
      PO-taller Lena$_{GEN}$

      'Kolja is a little bit / somewhat / much / considerably taller than Lena.'

We can thus translate (17b) as follows:

(20) $\exists d\ [TALL(kolja)(t_u) = TALL(lena)(t_u) + d \wedge d \leq d_c]$

More generally, we can conclude that the function of adjectival *po-* is to delimit the difference value by specifying that it is not higher than a contextually contributed standard. Formally, the semantics of adjectival *po-* can be represented as in (21):

(21) $[[po\text{-}]] = \lambda P \lambda d \lambda x \lambda t.[P(d)(x)(t) \wedge d \leq d_c]$

The compositional semantics of (17b) is as follows. Following Kennedy and Levin (2002) (with a slight modification), I take the semantics of the comparative morpheme to be as in (22a) below. The morpheme combines with an adjective and specifies that the degree to which the gradable property lexicalized by the latter (*G*) holds of the argument *x* at time *t* equals d_1 (the degree supplied by the comparative phrase) plus the difference value, d_2. The result of applying the comparative morpheme to the stem *vys-* 'tall', i.e., the semantics of *vyše* 'taller', is provided in (22b).

(22) a. $[[\text{-}e_{COMP}]] = \lambda G \lambda d_1 \lambda x \lambda d_2 \lambda t.G(x)(t) = d_1 + d_2$

      b. $[[vyše]] = \lambda d_1 \lambda x \lambda d_2 \lambda t.TALL(x)(t) = d_1 + d_2$

      c. $[[vyše\ Leny]] = \lambda x \lambda d_2 \lambda t.TALL(x)(t) = d_{Lena} + d_2$

      d. $[[povyše\ Leny]] = \lambda x \lambda d \lambda t.TALL(x)(t) = d_{Lena} + d \wedge d \leq d_c$

(22) e.   [[Kolja povyše Leny]] = $\lambda d\lambda t.TALL(kolja)(t) = d_{Lena} + d \wedge d \leq d_c$

      f.   [[Kolja povyše Leny]] = $\exists d [TALL(kolja)(t_u) = d_{Lena} + d \wedge d \leq d_c]$

Then the adjective combines with its internal argument, and we get (22c). The internal argument supplies the degree d_1, to which the subject is going to be compared. Note that by default the proper name *Lena* is, of course, interpreted as an individual and not as a degree. However, if it were interpreted as an individual in this sentence, this would lead to a type mismatch. As is well known, comparatives express relations between degrees (cf., e.g., Kennedy 2001 and references therein). I assume that the degree meaning results from one of the following mechanisms. One option is coercion: the meaning of *Lena* in the given context is coerced into *Lena's height*, which is a degree on a height scale. The other possibility is to assume the complement of a comparative is systematically a clause, partly elided in sentences like *John is taller than Mary (is tall)* (cf., e.g., Chomsky 1965, Kennedy 2007a, and references therein), and to derive a degree interpretation via this analysis.[16] Given that the choice is not essential for present purposes, in this paper I follow the first, simpler alternative.

In any case, the phrase *vyše Leny* 'taller than Lena' looks for an individual, a degree, and a time argument (*x*, d_2, and *t*, respectively) and renders the proposition according to which at time *t*, *x* is tall to the degree which equals Lena's height plus d_2.

Then the prefix *po-* applies in (22d). It may seem strange that a prefix attaches to an adjective only after the latter combines with its internal argument. However, such an approach is quite common in the analysis of Slavic verbal prefixes. These prefixes are known to attach at different syntactic levels, and some appear at relatively high ones (cf., e.g., Ramchand 2004; Romanova 2004). In many instances, the prefix quantifies over the object of the verb, for instance, with *na-* and, crucially, with verbal *po-* (cf., e.g., Filip 1999, 2000, 2005). Such cases are naturally accounted for if the prefix is taken to combine with a constituent which already contains not only the verbal stem but also its com-

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[16] It should be noted, though, that the ellipsis approach is not trivially extendable to Russian sentences like (17a), which lack a *wh*-phrase or complementizer and contain a genitive DP. Thus, compare (i) to (ii). While for the latter, a clausal analysis is quite natural, it is at least less clear how such an approach can be extended to the former.

(i)   Kolja   vyše   Leny.
      Kolja$_{NOM}$ taller   Lena$_{GEN}$
      'Kolja is taller than Lena.'

(ii) Kolja   vyše,   čem   Lena.
      Kolja$_{NOM}$ taller   than   Lena$_{NOM}$
      'Kolja is taller than Lena.'

plement. Therefore, it is not surprising that the adjectival *po-* also appears higher in the structure than the complement of the stem. In fact, this constitutes another characteristic shared by the two instances of the prefix.

Po- applies to the differential degree and specifies that it is lower than the contextually supplied expectation value. The meaning of the prefix is as specified in (21). The semantics of the phrase *povyše Leny* (ᴘᴏ-taller than-Lena) is represented in (22d). The phrase is interpreted as a function that looks for an individual, a degree, and a time argument (*x*, *d*, and *t*, respectively) and renders the proposition according to which at time *t*, *x* is tall to the degree which equals Lena's height plus *d*, where *d* is lower than the contextually provided standard d_c.

The phrase then combines with the subject *Kolja*, which saturates the individual argument in (22e). Further, existential closure applies, and the unbound degree variable gets bound by the existential operator. I assume that the tense argument gets saturated by a contextually supplied degree t_u. The meaning of the sentence is represented in (22f), which is equivalent to (20).

5.2. Why Only Comparatives?

If the prefix *po-* measures the distance between degrees, why is its application limited to comparatives in the adjectival (and adverbial) domain? Specifically, why does it not attach to adjectives in their simple, positive form? How can we explain the nonexistence of such adjectives as *povysokij (ᴘᴏ-tall) and *pointeresnyj (ᴘᴏ-interesting)?

On the basis of the literature on gradable adjectives, we can assume that a sentence like (23) means roughly that Dima's height is not lower than a contextually supplied standard. The latter corresponds to something like the average height for the relevant comparison class (for discussion see, e.g., Kennedy and McNally 2005, Kennedy 2007b, and references therein). The meaning of (23) can be thus represented as in (24):

(23) Dima   vysokij.
      Dima   tall
      'Dima is tall.'

(24) TALL(dima) $\geq d_s$
      where d_s is the comparison class-based standard.

Given this configuration, we could expect *po-* to apply to such adjectives and to measure the distance between the degree to which the individual argument is mapped and the standard of comparison. The resulting meaning would be: the argument exceeds the standard but to a relatively low degree.

For instance, (25) would mean, roughly, that Dima's height is slightly above the average. It is higher than the average, but the distance between the average and this height is not very big. The latter would be the meaning component contributed by *po-*.

(25) *Dima   povysokij.
       Dima   po-tall

      'Dima is tall but not very tall.'

Why are such sentences impossible? What rules out the combination of adjectives in their positive form with *po-*?

Different directions can be taken in order to account for this restriction. One option is to assume that the restriction is purely idiosyncratic in nature: the prefix is lexically specified as applying to comparative adjectives only. However, such an explanation is not very satisfactory, given that the application of *po-* is not limited to adjectives. An account based on more general principles rather than pure accident is clearly preferable.

I believe that the unacceptability results from the fact that the semantics of adjectives in the positive form, unlike comparatives, simply does not include a difference value. Or at least such adjectives are incompatible with expressions that specify such a value. Note that if sentences with such adjectives contain a phrase denoting a specific degree, this phrase is interpreted as the degree to which the individual argument is mapped. It cannot be analyzed as a difference value which measures the distance between the degree associated with the individual and the comparative standard. To illustrate, consider (26):

(26) John is two meters tall.

The phrase *two meters* represents the degree argument of the adjective *tall*, i.e., the degree to which John is mapped on the scale of height. It cannot be interpreted as the distance between John's height and the average tallness for the relevant comparison class. In other words, (26) cannot be interpreted as *John is two meters taller than the average individual in his comparison class*.

Given that adjectives in the positive form are incompatible with degree modifiers that represent the difference value, it is not surprising that such adjectives cannot combine with the prefix *po-*.

6. Adjectives and Verbs: Unifying the Two Domains

It is easy to see from section 5.1 that the function of adjectival/adverbial *po-* turns out to be quite similar to the contribution of attenuative *po-* that combines with verbs. What we see is that *po-*, when it applies to comparative ad-

jectives as well as to verbs, delimits the difference value by specifying that it is lower than some contextually specified standard. It thus has exactly the same function in the two environments. It follows that we need not stipulate that there are two homonymous prefixes *po-* with an attentuative flavor, one that attaches to adjectives and adverbs and one that attaches to verbs. Rather, there is a single prefix that may attach to words of different categories but requires that its input contain a difference value. Since this requirement is fulfilled by certain verbal, adjectival, and adverbial predicates, the prefix appears in a rich variety of morphological environments.

With verbs, the difference value constitutes the degree-of-change argument, i.e., this is the difference between the degree to which a property holds of an argument at the endpoint of the event and the degree to which it holds at its beginning point. With adjectives, this is the difference between the (maximal) degree to which the property holds of an individual and an additional degree which may be explicitly provided by a *than*-phrase or may be recoverable from the context.

The only difference between the semantics of verbal and adjectival attenuative *po-* is that the former looks for a predicate that takes an event argument, and the latter, a temporal one. This has to do with the different nature of adjectival and verbal predicates. Assuming that we allow the prefix this degree of flexibility, it can be concluded that we are dealing with the same prefix that applies across categories.

7. Adjectival *po-*: A Selective Use

It should be pointed out that there exists an additional use of adjectival comparative *po-* which at least seems to lack attenuative semantics. This use, referred to as *selective* or *absolutive*, is discussed by, e.g., Švedova et al. (1982), Knjazev (2007, 2010), Boguslavskij and Iomdin (2009), Guiraud-Weber (2011) and Sičinava (2011, 2015), and is illustrated in (27–28) below:

(27)   Ja   postaralsja   priexat'   pobystree.
       I   tried   arrive$_{INF}$ po-quicker

       'I tried to arrive as soon as possible.'

(28)   Vyberi   ogurcy   pokrupnee.
       choose$_{IMPF}$ cucumbers   po-bigger

       'Choose cucumbers as big as possible.'
       'Choose bigger cucumbers.'[17]

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[17] The sentence also has an attentuative reading whereby the addressee is asked to choose cucumbers that are somewhat bigger than some other specific cucumbers, e.g., the ones that were chosen last time.

Intuitively, these sentences do not seem to involve attenuative meaning. In contrast, the *po*-adjectives are associated with the strengthened, maximality-related interpretation "as much as possible" (cf., e.g., Guiraud-Weber 2011; Sičinava 2015). To illustrate, in (27) the subject tried to arrive as soon as possible, maximally quickly, and not with a relatively low speed.

A question naturally emerges as to whether selective *po-* should be unified with the attenuative one or rather treated separately, plausibly, under a polysemy approach. The two directions are evaluated below. In section 7.1, evidence in favor of a polysemy approach is provided. However, section 7.2 proposes a potential direction for unification. A detailed analysis of selective *po-* falls beyond the scope of the present paper and is left for future research.

7.1. In Favor of Polysemy

Evidence in favor of the polysemy approach comes from the considerable differences between the attenuative and the selective uses. It is important to emphasize that, in addition to (at least seemingly) lacking attenuative semantics, selective *po*-adjectives are associated with a whole cluster of special semantic, pragmatic, and syntactic properties that distinguish them from their attenuative counterparts.

First, selective *po-* presupposes the existence of a set of alternatives (cf. Sičinava 2011), out of which a person is expected to choose one that is located relatively high on some scale. For instance, (28) presupposes the existence of cucumbers of different sizes, and the addressee is asked to choose the bigger ones. In (27) the alternatives are more abstract and correspond to different degrees of speed.

Secondly, the selective construction is characterized by modal semantics (cf. Sičinava 2015 and references therein). It is strongly associated with such notions as choice and desire, with selecting the best alternative out of the existing ones. It is often found in imperative clauses and is often accompanied by lexical items carrying modal semantics of search and desire, such as *vybrat'* 'choose', *iskat'* 'seek', *nužno* 'needed', and *želatel'no* 'desirable' (Boguslavskij and Iomdin 2009; Sičinava 2011). As noted by Isačenko (1960/2003) and by Sičinava (2011, 2015), in the imperative mood the frequency of *po*-forms is considerably increased. Attenuative *po-* is, in contrast, not associated with modality and does not exhibit any preference for the imperative mood; further, its use need not receive lexical support from the presence of words with modal semantics like *iskat'* 'seek' or *pytat'sja* 'try'. It is easily acceptable in simple declarative sentences and does not contribute to the modal flavor that systematically accompanies the selective use.

In addition, selective *po-* does not combine with an overt comparative *than* phrase. In the presence of such a phrase, only the attenuative reading is obtained:

(29) a.   Vyberi   ogurcy   pokrupnee.
           choose$_{IMPF}$ cucumbers po-bigger

           'Choose cucumbers as big as possible.'   **selective**
           'Choose cucumbers that are somewhat bigger.'   **attenuative**

     b.   Vyberi   ogurcy   pokrupnee, čem v prošlyj raz.
           choose$_{IMPF}$ cucumbers po-bigger   than in last   time

           'Choose somewhat bigger cucumbers than last time.'

                                            attenuative only

The existence of ambiguous sentences like (29a) constitutes an additional piece of evidence in favor of the polysemy approach. It suggests that the meaning of adjectival/adverbial *po-* is not fully determined by the environment in which it appears. This in turn means that the differences between the selective and the attenuative uses are not fully reducible to the linguistic environment of the prefix. Rather, the prefix itself appears to be ambiguous. (However, if the two meanings of (29a) are shown to correspond to two different syntactic structures, we will have to conclude that the linguistic environments of the two types of *po-* are not truly identical.)

To sum up thus far, evidence in favor of distinguishing the two uses of *po-* and providing each with a separate analysis is rather substantial. It is thus possible that in Russian the prefix *po-* is polysemous. One of its uses, the attenuative, is available across categories, while the others are either purely verbal or purely adjectival/adverbial. It is to the analysis of the former that the present paper has been devoted.

7.2. A Direction for Unification

While it is beyond the goals of the present paper to provide a formal analysis of selective *po-*, it is worth mentioning that a unification of this use with the attenuative one is not, in fact, impossible. In this subsection I provide tentative evidence in favor of including the attenuative component in the semantics of the selective prefix, thereby unifying the two uses. Further investigation of this issue and a formal account of selective *po-* is left for future research.

It has been suggested in the literature that (perhaps paradoxically) selective *po-* is associated with some attenuative/restrictive flavor. As discussed by Sičinava (2011), Švedova et al. (1982) subsume this use under the attenuative one. Boguslavskij and Iomdin (2009) suggest that it contributes a weakening effect in relation to the superlative alternative. Roughly speaking, po-*big* is weaker than *the biggest*.

The restrictive flavor of selective *po-* is, I believe, particularly evident with adjectives that lexicalize upper-closed scales. The set associated with such

po-adjectives is, at least by implicature, linked to a degree on the scale that is lower than the maximal value. Two examples are provided in (30):

(30)   a.   Prinesi   polotence   posuše.
            bring   towel   ᴘᴏ-drier

            'Bring as dry a towel as possible.'

       b.   Vyberi   trjapku   počišče.
            choose   duster   ᴘᴏ-cleaner

            'Choose as clean a duster as possible.'[18]

Example (30a) strongly suggests that none of the available towels are truly dry. The addressee is asked to choose a towel that is as dry as possible, but it will still possibly be wet. Analogously, one is likely to conclude from (30b) that none of the dusters the addressee can choose from is completely clean. Still, the degree of cleanliness varies, and the addressee is asked to select an entity that is characterized by this property to a relatively high degree.

The same effect is observed with other upper-closed scale *po*-adjectives (under the selective *po-* meaning), such as *pozdorovee* (ᴘᴏ-healthier) and *po-rovnee* (ᴘᴏ-leveler).

With adjectives whose scales lack an upper boundary, the restrictive meaning component is less obvious but still seems to be present. For instance, (28) above does not seem to be appropriate if the relevant set of cucumbers includes truly huge ones. Somehow, the adjective *pokrupnee* (ᴘᴏ-bigger) does not constitute a good choice in such a context. In contrast, the sentence is perfectly acceptable in the context where all the available cucumbers are relatively small, and the addressee is essentially asked not to take the smallest ones.

Thus selective *po-*, despite its apparent 'high value' meaning, is associated with a restrictive nature, which in turn suggests that it could be unified with the corresponding attenuative prefix. One possible line of reasoning is the following. As stated above, sentences with selective *po-* presuppose the existence of a set of alternatives. In the simplest case, this is a set of individuals out of which a choice is to be made. The alternatives are associated with different degrees along the scale lexicalized by the adjective (e.g., a scale of size, speed, weight, etc.) The *po*-adjective denotes a collection of entities that are included in this presupposed set and are mapped to a degree that is higher than the average/expectation value (again, relative to this set). Thus, we deal with entities that exceed the relative standard. This meaning of excess (the 'higher than' relation) is contributed by comparative morphology and captures such

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[18] Both sentences also have an attenuative reading, irrelevant for the present discussion.

intuitive meaning components as, e.g., "as big as possible," "the bigger ones," or "relatively big" in the case of (28).

In turn, the function of *po-* is to further contribute a restrictive meaning component, stating that the degree, although above the standard, is not maximal or not too high. This result may be achieved by specifying that the degree of the argument is **not considerably higher** than the standard. In other words, it is higher than the standard but the distance between the two is still **relatively small**. This in turn takes us back to the function of attenuative *po-*. Under the analysis tentatively suggested here, selective *po-* essentially delimits the difference value, specifying that the difference between the degree associated with the argument and the standard is relatively small (or not particularly large). This is precisely the contribution that has been ascribed to attenuative *po-* above.

However, it still remains to be seen (i) how the modalized meaning of selective *po-*-adjectives is added, (ii) how persistently the restrictive nature characterizes selective *po-*,[19] and (iii) how the syntactic restrictions associated with the latter are to be accounted for. I leave the investigation of these issues to future research.

8. Conclusion

To sum up, in this paper I have proposed that the adjectival and verbal uses of attenuative *po-* should be united under a single scalar analysis. We deal with a prefix that applies across grammatical categories and whose function is to measure the difference value, specifying that it is relatively low. Within the verbal domain, the degree argument to which *po-* applies constitutes the degree of change, as proposed by Součková (2004a, b). In the adjectival domain, the prefix interacts with the degree that measures the scalar distance between two arguments.

The comparative use of *po-* is thus important, as it renders further support for a scalar analysis of the attenuative *po-* found with verbs and, more precisely, for the analysis of this prefix as delimiting a difference value. Only assuming this analysis can we unite verbal *po-* with its comparative counterpart. Further, *po-* supports the extension of the scalar approach associated with gradable adjectives to verbs of gradual change, telicity, and event delimitation. Its properties reveal that a given morpheme may apply both to the

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[19] Here it is worth noting that sometimes selective *po-* is used for pragmatic reasons in order to make the utterance weaker and less imposing (cf., e.g., Guiraud-Weber 2011), rather than in order to restrict the degree, indicating, e.g., its nonmaximality. Uses of this type do not contradict the proposed direction for an analysis. Analogous uses of items with weakening semantics for purely pragmatic purposes, e.g., for the sake of politeness, are widely attested across languages.

difference value associated with a comparative adjective/adverb and to the degree of change present in the semantics of a verbal predicate. This supports the idea that the notion of a difference value is indeed applicable not only within the adjectival domain but also within the verbal one.

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