Reviews

Olga Kagan. *Scalarity in the verbal domain*. Cambridge: Cambridge University Press, 2016. 278 pp. ISBN 9781107092624.

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A long-standing topic in the discussion of Slavic languages is the proper analysis of verbal prefixes. Verbal prefixes play a special role in the expression of grammatical aspect as well as in word formation. One of the more complex issues associated with verbal prefixes in the Slavic languages is that they seem to resist a systematic and uniform analysis. In her monograph, Olga Kagan proposes a unified analysis of Russian verbal prefixes. The overall goal of her book is, as she states (p. 21), "to provide a unified formal semantic analysis for individual prefixes as well as for the more general system that underlies verbal prefixation in Russian." The analysis Kagan proposes is couched in degree semantics. A scalar approach to verbal prefixes in Slavic languages is not novel and goes back to Filip's work on this topic (e.g., Filip 2000). Nevertheless, the extent to which Russian verbal prefixes are covered within this analysis is unique to Kagan's work.

Degree semantics originated in the analysis of gradable adjectives like English *tall* or *expensive*. The notion of a scale is at the heart of this approach. A scale, following Kennedy and McNally (2005), among others, is a linearly ordered set of values (or degrees) of a measurement dimension such as height, price, or width. A gradable adjective, for example, *tall*, maps its argument onto a scale (in this case a height scale) and states the argument's degree on that scale, i.e., its height. Each gradable adjective requires a comparison degree, which is often left implicit. Saying *John is tall* can be interpreted as meaning 'John is tall for a boy of his age' or 'John is tall for an average American'. The exact interpretation is often determined by the context. Thus, saying that John is tall is a comparison of his degree of tallness to an (implicit) comparison degree.

Kagan takes the essential ingredients of degree semantics—scales and their components as well as standards of comparison—and applies them to the analysis of verbal prefixes in Russian. The central hypothesis put forward by Kagan is called the "scale hypothesis." It states that all verbal prefixes are instantiations of the same template. Without going into the formal details, the basic idea is that verbal prefixes specify a relation between degrees. The degree of a gradable property associated with the verbal predicate can either be less than (<), more than (>) or equal to (=) a comparison degree. The template

Kagan proposes is shown below in (1).[1] A prefix takes a gradable property *Q*, which is related to a predicate *P*, and specifies the relation *R* between the degree *d* of the gradable property and a comparison degree d_s. The second degree argument in the template, *d'*, is a degree related to the predicate *P*. In case *P* and Q_p coincide, *d'* is equal to *d*. Kagan does not explain why the predicate needs to have a degree argument when the prefix applies to the gradable property *Q* which is related to *P*.[2] *f*(*e*) is a function that restricts the degree to a stage of the event (i.e., its beginning or its end). The verbal prefix indicates whether *d* is less than, more than, or equal to the standard of comparison at, for example, the end of the event. Beside the relation *R*, verbal prefixes can also specify the type of gradable property *Q*, the standard of comparison d_s, or the function *f* which relates the degree to a part of the event. Thus, the template contains a number of variables that can either be saturated by the verbal prefix or the linguistic context (e.g., the verb or one of its complements) and therefore leaves many options for variation among verbal prefixes.

(1) The scale hypothesis (Kagan 2016: 26)

If π is a verbal prefix in Russian, then [[π]] instantiates the following template:

$\lambda P \lambda d_s \lambda d \lambda d' \lambda x \lambda e.[P(d')(x)(e) \wedge Q_p(d)(x)(f(e)) \wedge d\ R\ d_s]$

Before investigating the range of verbal prefixes, Kagan starts in chapter 1 with an introduction to the relevant background of the analysis. This chapter has three aims: (i) to provide a brief (and not too technical) introduction to degree semantics, (ii) to introduce some of the problems Slavic verbal prefixes cause for linguistic analysis with a short overview of some previous analyses, and (iii) to introduce Kagan's own scalar account of the semantics of verbal prefixes.

In chapters 2 through 6, Kagan presents an analysis of various verbal prefixes: *po-*, *na-*, and *pro-* in chapter 2, *do-*, *nedo-*, and *pri-* in chapter 3, *pod-* and *pere-* in chapter 4, and *ot-* and *za-* in chapter 5. In chapter 6 Kagan discusses nine prefixes that are more restricted in their use than those investigated earlier. Kagan's aim with respect to each prefix is twofold. First, she aims at demonstrating that its core meaning can be represented within the scalar framework. Second, she intends to show that the different readings of each prefix can be derived from its core meaning. Kagan allows for idiosyncrasy and noncompositional meanings, but she tries to advance a unified semantic account of verbal prefixes as far as possible. Instead of discussing Kagan's

[1] I will concentrate on the essential parts of the template and leave certain details aside.

[2] I will return to this issue later again after finishing the overview of Kagan's analysis.

analysis of all the aforementioned prefixes, I would like to focus on a single example to illustrate the contribution of her scalar approach to the analysis of Russian verbal prefixes.

An illustrative example of Kagan's approach is her analysis of the prefix *pro-*. The verbs to which *pro-* attaches express either a literal motion through space, as in (2), or a fictive motion, as in (3). In (2), Ivan literally moves along a path of two kilometers length. Masha and Ella, on the other hand, are not literally moving in (3), but the book in (3a) and the article in (3b) can be understood as having a certain extent. Masha and Ella "move" through this extent by reading the book or looking through the article.

(2) Ivan pro-šel dva kilometra.
Ivan PRO-walked two kilometers
'Ivan walked two kilometers.' (Kagan 2016: 57)

(3) a. Maša pro-čitala knigu.
Maša PRO-read book
'Masha read a/the book.'

b. Ella pro-smotrela stat'ju.
Ella PRO-looked article
'Ella looked through the article.' (Kagan 2016: 57)

What is common to (2) and (3) is that the complex predicate expresses a change along a scale—a path scale in the first example and a volume/extent scale for the examples in (3). A path scale represents linearly ordered points in space, whereas a volume/extent scale measures the quantity of an entity. Literal motion is analyzed as a change along a path scale and fictive motion is understood as a change along a different type of scale, e.g., a volume/extent/quantity scale. Thus, the scalar approach easily allows integrating both the spatial and nonspatial meanings of verbal prefixes within the same analysis.

The core meaning of *pro-* is represented in (4). The representation is a simplified version of the template in (1), resulting from the fact that P and Q_p are identical, and thus the conjunct containing Q_p can be eliminated. D is a degree of change, which is the degree to which the referent of x changes within the event denoted by e. *Pro-* indicates that at the end of the event the degree of x equals the standard of comparison d_s. As Kagan states (p. 58) : "*pro-* imposes between the two degrees [the final one and the standard of comparison] the relation of identity."

(4) $\lambda P \lambda d_s \lambda d \lambda x \lambda e.[P(d)(x)(e) \wedge d = d_s]$ (Kagan 2016: 58)

In (2), the standard of comparison is explicitly represented by the phrase *dva kilometra* 'two kilometers'; in (3) it is specified by the complements of the complex verb. For (3a), the standard degree represents the maximum quantity of the book, and in (3b) it is the maximum quantity of the article. Thus, (3a) is only true if the subject referent reads the book until the standard, i.e., the end of the book, is reached. The sentence in (2), on the other hand, is true if Ivan walks until he has covered a distance of two kilometers.

The different readings of *pro-* result from different scales to which the prefix can apply. Two of them, path scale and volume/extent scale, have already been introduced above; a third, time scale, is illustrated by the example in (5). With respect to this example, Kagan (pp. 58–59) writes: "[5] involves measurement along a time scale. The duration of an event (i.e., its degree of change along a time scale) is asserted to be identical with the value *two hours*."

(5) Ivan pro-rabotal dva časa.
Ivan PRO-worked two hours
'Ivan worked for two hours.' (Kagan 2016: 57)

The notion of 'change' underlying this analysis goes back to Dowty 1979. Dowty explains dynamicity, any nonstatic happening, as a change, since it requires at least two points in time for evaluation, whereas states can be evaluated at a single point. By using this broad notion of change—a notion also covering temporal changes—it is possible for Kagan to provide a uniform analysis for *pro-* covering the examples in (2), (3), and (5).

Pro- differs from prefixes like *po-* and *na-* by the relation between the final degree and the standard of comparison. *Po-* indicates that the final degree is lower than the standard degree, which can, for example, be a context-dependent expectation value. *Na-*, on the other hand, indicates that the final degree exceeds the standard of comparison. Other prefixes, for example, the delimitative *pri-*, do not specify a degree of change, as *pro-*, *po-*, and *na-* do. Rather, they specify a property of the resulting state. A telling example is *priostanovit'sja* 'stop for a while', which does not mean 'stop to a degree less than expected or less than required'. Instead, the temporal interval of the stop, the result of the stopping, is specified as being short (p. 92).

Chapter 7 summarizes the various parameters by which verbal prefixes can differ. These parameters are (i) scale dimensions, as the brief discussion of *pro-* indicated, (ii) the relation between the degrees (e.g., 'less than', 'more than', 'equal to'), (iii) the standard of comparison, and (iv) the relation between the degree (or better, the scale) and the event. A scale can either measure a change expressed by the verb, or it can measure a property which does not (necessarily) change. An example of such a scale is the intensity scale associated with emotional verbs like English *love*. A person loves another person to a certain degree, but there is no (necessary) increase or decrease in the inten-

sity of the feeling. The scale can also measure properties of a resulting state, as was mentioned with respect to *pri-* above. Kagan brings all these parameters together and illustrates the range of variation that verbal prefixes employ.

In chapter 8, Kagan discusses how verbal prefixes can affect the case marking of the verb's complement. In some instances, the complement receives genitive rather than accusative case marking as a result of prefixation. Kagan analyses the contexts in which this effect can be observed and proposes a semantic analysis of genitive objects based on semantic or pseudo-incorporation (a more detailed analysis of genitive case marking on object arguments can be found in Kagan 2014).

The book has several appendices. The first focuses on the notion of scalar change in more detail than in chapter 1 and gives a semantic analysis of different types of scalar changes. The second focuses on the semantic composition of some sample verbs and a range of verbal prefixes. Semantic composition, mostly neglected in the main body of the text, is illustrated here for the prefixes *pod-*, *nedo-*, *do-* and separately for the various readings of *pere-*.

Aspects of the scalar analysis of verbal prefixes presented in this book have been published in earlier work by Kagan (e.g., Kagan 2012, 2013). The scale hypothesis has been proposed in previous work as well (e.g., Kagan 2012, 2013). Readers of the previous papers will be familiar with many aspects of the analysis, as some parts of the book are directly taken from those prior works. Whole paragraphs have been directly taken from the papers: most parts of chapter 4.1—the analysis of the verbal prefix *pod-*—are more or less directly copied from the 2012 paper. For example, section 4.1.1 (pp. 97–100) is identical to the corresponding section in the paper (pp. 213–16) without even mentioning the paper. The analysis of the prefix *pere-* is taken from Kagan's 2013 paper. Although the formulations have been changed slightly, the text in the book is very close to the one in the paper. Again, Kagan has not indicated that the analysis has been published in earlier work. It would have been welcome if Kagan had at least indicated which parts of her analysis had already been published, as this would have allowed the reader to see which parts are new. (Given the price of such a volume, I consider this a serious issue for the reader.) Anyway, the book extends the single papers by covering a larger set of verbal prefixes and bringing the isolated pieces of the analysis together within a single volume.

Overall, the book shows how different prefixes—with apparently diverse meanings—can be meaningfully analyzed within a unified framework. Two aspects of Kagan's analysis strike me as controversial and call for discussion. The first is the lexicalization of scales by verbs, and the second concerns Kagan's formal analysis.

Kagan proposes a scalar analysis for Russian verbal prefixes. For most uses of verbal prefixes, she assumes that the scale to which the prefix applies is contributed by the linguistic environment, not by the prefix itself. "Lin-

guistic environment" means either the verb or one of the verb's complements. In many cases, Kagan proposes that the scale is lexicalized by the verb. This is uncontroversial for verbs denoting scalar changes. Well-known examples are degree-achievement predicates, which are often derived from gradable adjectives. Even without a verbal prefix or another degree expression, degree achievement predicates express a scalar predication. The English *widen* means 'becoming wider than before', thus denoting an increase in width. The same holds for the Russian correspondents of English degree achievements.

For other verbs, the assumption that they lexicalize a scale is less obvious. Kagan proposes for verbs like *solit'* 'to salt' (p. 86) and *grešit'* 'to sin' (p. 199), to mention only two, that a scale is contributed by the verb's lexical meaning. But do we want to consider such verbs as expressing a scalar predication in every use? With regard to *grešit'*, Kagan assumes that the verb lexicalizes a volume/extent scale (p. 199). Such a scale would measure the quantity/amount of sins committed by the referent of the subject argument. Kagan does not present argumentation in favor of this view. She bases it on the fact that the verb can combine with the prefix *na-*, which results in the complex verb *nagrešit'* meaning 'commit a lot of sins'. Why not assume that either the prefix introduces the scale or that the scale is pragmatically supplied?[3] One of the most problematic aspects of Kagan's analysis, in my view, is that she does not propose criteria to decide whether a verb lexically contributes a scale or not. This particular question is crucial for her analysis. With respect to the 'excess' reading of *pere-*, illustrated in example (6), Kagan states (p. 136) that the prefix only applies to a time scale, as in (6b), if the verb itself does not lexicalize a (property) scale. Thus, Kagan makes predictions regarding the interpretation of prefixed verbs based on the lexicalization of scales.

(6) a. Ira pere-grela rastvor.
Ira PERE-heated solution
'Ira overheated the solution.'

b. Rebenok pere-sidel na solnce.
child PERE-sat on sun
'The child sat in the sun for too long.' (Kagan 2016: 132)

Kagan does not provide criteria for the lexicalization of scales but stipulates that certain verbs are lexically scalar. Additionally, she does not discuss the consequences of her view on the lexicalization of scales: Do verbs like *solit'* and *grešit'*, which do lexicalize a scale in her view, have an open-degree argument? If so, how is the degree argument saturated in cases where there is no appropriate verbal prefix or other degree expression present in the sentence?

[3] See Fleischhauer 2015 for an attempt at developing such an analysis.

If a verb lexicalizes a scale, the scalar meaning has to be part of the lexical meaning, but is this really the case? Does *grešit'* mean—in each use—'to commit a quantity *d* of sins', or does it mean just 'to commit a sin'? Although these questions follow directly from her analysis, Kagan does not address them.

With respect to the formal analysis, two points call for discussion. First, essential aspects of the analysis are left implicit, and second, it is not clear how Kagan conceives of degrees. Starting with the latter issue, it seems that Kagan takes degrees to be of a dual nature. On the one hand, she takes them to be points on a scale; on the other hand, she treats them as intervals—which are sets of points—on a scale. Both views on degrees are advocated in the literature (see Kennedy 2001 for an overview), but usually degrees are either taken as one or the other. Kagan's dual view of degrees results in incorrect formalizations. This becomes most obvious in her discussion of the verbal prefix *za-*. The semantic representation Kagan proposes (p. 176) for *za-* is given in (7). Inside the first conjunct, the comparison degree d_c is taken to be a point. Within the last conjunct, it is interpreted as an interval. d_c stands in two different relations—the 'less than relation' and the 'subset relation'—which is formally flawed, as the relations hold between different ontological objects. Thus, the analysis of *za-* is formally unsound and requires revision.

(7) $\lambda P \lambda d \lambda d' \lambda d'' \lambda x \lambda e.[P(d)(x)(e) \wedge Q_p(d')(x)(END(e)) \wedge Q_p(d'')(x)(BEG(e)) \wedge d'' < d_c \wedge d' \subseteq d_c]$

The other issue regarding the formal analysis is that Kagan leaves essential aspects of the analysis implicit. For the 'comparative' reading of *pere-*, as in (8), the standard of comparison is determined by the object phrase. Here the loudness of Yuri's shouting exceeds the loudness of the sounds produced by the opposition members. Kagan states explicitly that "the standard is anchored to the referent of the object" (p. 142). In the semantic representation of the 'comparative' reading of *pere-*, shown in (9), all that is expressed that the interval *d* includes the interval d_s, but no connection between the standard and the object referent is stated. Given that the determination of the standard is the crucial aspect distinguishing 'comparative' *pere-* from other uses of the prefix, a central aspect of the prefix's meaning is missing.

(8) Yuri pytalsja pere-kričat' členov oppozicii.
Yuri tried PERE-shout members opposition
'Yuri tried to shout down opposition members.' (Kagan 2016: 139)

(9) $\lambda P \lambda d \lambda x \lambda e.[P(d)(x)(e) \wedge d_s \subset_u d]$ (Kagan 2016: 141)

Interestingly, in analyzing a concrete example, Kagan (p. 144) introduces the relevant property of the object as a standard of comparison. But she does not

provide a compositional analysis of the example, so it remains unclear how the standard is introduced in the semantic representation.

A similar problem presents itself with the analysis of 'iterative' *pere-* in (10). Kagan presents a convincing discussion of this reading of the prefix without, however, attempting a formalization of its meaning. At the end she proposes that "[t]he standard […] is essentially the whole scale" (p. 150). It is not clear what this statement means, especially with respect to a possible formalization. Like in the previous case, an essential parameter distinguishing the different readings of the prefix is missing.

(10) Lena pere-stirala plat'e.
Lena PERE-washed dress
'Lena rewashed the dress.' (Kagan 2016: 147)

Finally, a related problem comes up in Kagan's analysis of *do-*. With respect to this prefix, she states (p. 73): "If the verbal stem contributes a scale, it is to this scale that *do-* will apply. […] If the verb itself does not contribute a scale, but is an incremental theme verb, then the prefix will apply to the scale introduced by the direct object (a volume/extent scale). If none of these conditions is satisfied, the prefix can apply to the time scale." In the appendix Kagan presents a compositional semantic analysis of a single example. She shows how the prefix combines with a verb lexicalizing a scale, but a compositional analysis of the other cases mentioned above is missing. How does the compositional process work if the verb does not lexically encode a scale but the scale is contributed by the direct object? In one case the prefix "takes" the scale from the verb; in the other case the prefix is "taken" from the complement. Does this require different syntactic analyses of *do-*, one in which the prefix combines with the verb before the complex verb combines with the complement and a second one in which the verb first combines with its complement and the prefix merges on top of this structure? Given the distinction between lexical and superlexical verbal prefixes—an issue discussed by Kagan in chapter 2—this could be the solution. But is there some alternative formalism to handle the fact that the prefix requires a scale but the verb cannot contribute it? A possible account could be formulated in terms of scalar underspecification, which is occasionally mentioned by Kagan but not formally worked out (see Fleischhauer and Gamerschlag 2014 for a developed analysis of scalar underspecification and scale composition). It is a weakness of the current volume that compositional issues are only rarely and mostly informally addressed.

Another aspect concerning the formal analysis is that for some prefixes there is no semantic representation given at all. The prefix *ot-*, examined in chapter 5, is discussed only informally, although Kagan claims that a scalar analysis for the prefix's different readings is applicable. Also the brief discussion of the prefixes *pred-*, *v-*, *pre-*, *niz-*, *nad-*, *vz-*, and *iz-* in chapter 6 occurs with-

out any semantic representations. Given that Kagan's aim is to show that the scale hypothesis holds true for Russian verbal prefixes, it could be expected that this claim be proven for a substantial number of prefixes. But out of the 17 prefixes discussed in this book—in more or less detail—there is no semantic representation for eight. (For two more prefixes, *de-* and *dis-*, Kagan claims that they do not have to fit the scale hypothesis as they are borrowed. She does, however, argue [p. 185] that the two can receive a scalar analysis.) Kagan's claim that all these prefixes can receive a scalar analysis does not seem unreasonable, but whether they really fit into her templatic representation cannot be decided on these grounds. Thus, although the general approach is interesting, it remains an open question whether the template represented in (1) is adequate for capturing the semantics of all the prefixes. To be fair, Kagan (p. 243) notes in the concluding part of the book that the analysis of further prefixes—she mentions *o*(*b*)- —might require revisions of the template or the introduction of new values to the scale parameters.

Kagan's book on scalarity in the verbal domain offers an interesting perspective on the analysis of verbal prefixes in Russian. The approach covers a large range of data and is well related to previous analyses, both by Kagan herself as well as other authors. Kagan is able to integrate other analyses—irrespective of whether they are explicitly within a scalar framework or not—into her own approach. Some details of her own analysis, especially with respect to compositional issues, are not as fleshed out as one would like. This makes it a bit hard to decide whether her aim—providing "a unified formal semantic analysis for individual prefixes as well as for the more general system that underlies verbal prefixation in Russian" (p. 21)—is really fulfilled. At least Kagan shows how a unified account of the semantics of Russian verbal prefixes can look.

The analysis Kagan presents is not only relevant for Russian verbal prefixes, but also shows a direction for analyzing Slavic verbal prefixes in general and broadens our general understanding of scalarity in the verbal domain. With respect to the first point, Kagan presents a limited comparison of Russian verbal prefixes with Czech prefixes. She demonstrates that her scalar approach is a useful framework for comparing the distributional differences and the meaning of verbal prefixes across Slavic languages.

Kagan's book is a valuable contribution to the discussion of Russian verbal prefixes, as well as to the discussion of scalar semantics both within and outside the verbal domain. The volume is accessible to readers who do not have a background in degree semantics, as well as those not familiar with Russian. Despite the criticism stated above, Kagan's scale hypothesis deserves to be further explored to see how far a scalar approach can fruitfully be used for the analysis of Slavic and especially Russian verbal prefixes.

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