Semantic Motivations for Aspectual Clusters of Russian Verbs

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1. Introduction

Lexical meaning and aspect do not function independently in Russian. The meanings of verbs motivate their aspectual behavior because different types of events and their relationship to time are conceptualized in different ways. This article demonstrates how the presence of specific components in the meanings of Russian verbs correlates with the formation of specific types of Perfectives. The aspectual derivation patterns of Russian verbs are transparently motivated by the meanings of the verbs themselves.

In order to explore how differences in meaning motivate differences in the aspectual behavior of verbs, it is necessary to replace the overly-simplistic "pair" model of Russian aspect with a more nuanced model, the "cluster" model, which recognizes various types of Perfectives and cluster structures based on a single Implicational Hierarchy. This article is devoted to the three metaphors that motivate the patterns observed in the Russian aspectual system. The structure of aspectual clusters is highly constrained due to the logic of how the metaphors interact, motivating the Implicational Hierarchy which in turn orders the composition of clusters. The different cluster structures associated with different verbs are largely predictable from the lexical meanings of the verbs. In this model motion verbs play a central, prototypical role in aspect, rather than being relegated to the status of oddities. Bi-aspectual verbs are also accommodated.

2. The Pair Model vs. the Cluster Model

All Russian verbs are either Perfective (marked here with a superscript "p") or Imperfective (marked with a superscript "i") in all forms and tenses, and indeed even bi-aspectual verbs are never ambiguous in context (Isachenko 1960: 143–44; Muchnik 1966: 61; Avilova 1968: 66; Galton 1976: 294; Gladney 1982: 202; Chertkova 1996: 100–9; Jászay 1999: 169; Zalizniak and Shmelev 2000: 10; but note the lone dissenter Timberlake (2004: 407–9), who refers to bi-aspectual verbs as "anaspectual"). The ubiquity of the Perfective vs. Imperfective distinction, combined with the existence of verbs such as *написать*[p] and *писать*[i], both of which mean 'write', but differ only in their aspect, has inspired several generations of Slavists to claim that all (or nearly all) Russian verbs exist as aspectual "pairs" (cf. for example

Vinogradov 1938; Shakhmatov 1941; Bondarko 1983; Chertkova 1996; Zalizniak and Shmelev 2000; Timberlake 2004). Only occasionally have scholars voiced suspicions that there may actually be more complexity than "pairs" in the aspectual system of Russian (Isachenko 1960; Bertinetto and Delfitto 2000; Tatevosov 2002). The one thing that these challenges to the prevailing "pair" model share is the observation that there are often two or more Perfective verbs aspectually related to a given Imperfective verb. Thus, for example, *писать*[i] 'write' is aspectually related to many Perfective verbs, among them *написать*[p] 'write', *пописать*[p] 'write (for a while)', *подписать*[p] 'sign', and *переписать*[p] 'rewrite'. The "pair" model is inadequate to account for any relationship that involves more than one Perfective verb in association with one Imperfective verb. One solution to the proliferation of Perfectives is to recognize only Perfectives with secondary Imperfectives as "pairs" e.g., *подписать*[p] 'sign' – *подписывать*[i] 'sign', and *переписать*[p] 'rewrite' – *переписывать*[i] 'rewrite'. This approach, however, ignores the relationships among verbs such as *писать*[i] 'write', *написать*[p] 'write' and *пописать*[p] 'write (for a while)'.

In Janda forthcoming a I propose an alternative model that recognizes as an aspectual "cluster" any group of verbs joined via transitive relationships on the basis of aspectual derivational morphology. In other words, an aspectual cluster contains all verbs that are aspectually related to each other. In the case of *писать*[i] 'write', this would include all the Perfectives listed above along with their secondary Imperfectives, as well as Perfectives such as *поподписывать*[p] 'sign (for a while)'. In the remainder of this section I present a brief description of the mechanics of the cluster model as background for the main purpose of this article. I then undertake a semantic analysis of the metaphorical motives for aspectual clusters, building on Janda forthcoming a which does not offer a semantic analysis. This constitutes the main contribution of this article.

The presence of a one-to-many relationship between an Imperfective verb and related Perfective verbs suggests that there are several different types of Perfectives. In Janda forthcoming a I identify four types of Perfectives which are distinct in terms of their morphological and semantic profiles:

- *Natural Perfectives*, which usually describe the natural culmination of an Imperfective Activity, as in *написать*[p] 'write', although a few Natural Perfectives describe sudden attainment, as in *увидеть*[p] 'see' (thus including both Accomplishments and Achievements, cf. Vendler 1957). Natural Perfectives generally do not yield secondary Imperfectives.
- *Specialized Perfectives*, for which a prefix adds enough new information to regularly motivate the derivation of secondary Imperfectives, as in *переписать*[p] 'rewrite' – *переписывать*[i] 'rewrite'.

- *Complex Act Perfectives*, which combine an Imperfective Activity with temporal limits, creating verbs such as *пописать^p* 'write (for a while)' and *заскрипеть^p* 'begin to squeak'. The prefixes most commonly associated with Complex Act Perfectives are *по-* 'for a while', *про-* 'for a given duration', *за-* 'begin' and *от-* 'stop'. It is generally not possible to derive secondary Imperfectives from Complex Act Perfectives.
- *Single Act Perfectives*, which extract a single cycle from a repetitive Activity, as in *скрипнуть^p* 'squeak (once)'. Most Single Act Perfectives are built with the suffix *–ну-*, although prefixation is also an option, especially with motion verbs, as in *сходить^p* 'go (by foot someplace and back once)'. Single Act Perfectives do not generally admit the formation of derived Imperfectives.

Note that a cluster may contain several Specialized Perfectives and/or several Complex Act Perfectives, but to save space below only one example of each is cited. Verbs derived from Specialized Perfectives (such as secondary Imperfectives like *переписывать^i* 'rewrite' and any subsequent Complex Act Perfectives, such as *попереписывать^p* 'rewrite (for a while)') are likewise not cited, though they are usually presumed to exist.

The proliferation of Perfectives could potentially create a chaotic situation with a daunting number of different types of clusters. Logically five items (one Imperfective Activity, plus four types of Perfectives) can yield thirty-one different arrangements. I have shown, using two different databases of several thousand verbs each (representing the morphological range of Russian verbs in Janda forthcoming a, and representing high-frequency items of a basic Russian lexicon in Janda and Korba in progress), that three cluster structures account for approximately half of the verbs in Russian (the main cluster types), and that all other verbs contribute only ten more cluster types. With one marginal exception (the rare Perfective isolates such as *уцелеть^p* 'survive'), all cluster types are predicted by a single Implicational Hierarchy:[1]

Activity > (Natural Perfective/Specialized Perfective) > Complex Act > Single Act

The above formula indicates that all clusters contain an Activity. In addition to an Activity, a Natural Perfective and Specialized Perfectives may or may not be present,

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[1] Note, however, the unusual status of Perfective isolates. They are all morphologically complex, which means they are probably the remnants of larger clusters. Also, they tend to derive secondary Imperfectives, despite the fact that they are not recorded in dictionaries. Yandex.ru, for example, turns up over 570 hits for *уцелевать^i* 'survive', suggesting that the Perfective is not an isolate, but part of a more common cluster type.

and their relative appearance is not ordered. Up to this point, the hierarchy predicts four types of clusters: 1) Activity, 2) Activity + Natural Perfective, 3) Activity + Specialized Perfective, 4) Activity + Natural Perfective + Specialized Perfective. All four of these arrangements can be further enlarged by adding either Complex Act or Complex Act + Single Act, yielding a total of twelve types of clusters sanctioned by the Implicational Hierarchy.

Some examples of typical cluster structures, beginning with the three most common types, are:

- Activity (*писать*^{i} 'write') + Natural Perfective (*написать*^{p} 'write') + Specialized Perfective (*переписать*^{p} 'rewrite') + Complex Act (*пописать*^{p} 'write (for a while)')
- Activity (*вязать*^{i} 'tie') + Natural Perfective (*связать*^{p} 'tie') + Specialized Perfective (*развязать*^{p} 'untie')
- Activity (*работать*^{i} 'work') + Specialized Perfective (*переработать*^{p} 'revise') + Complex Act (*поработать*^{p} 'work (for a while)')
- Activity (*крепнуть*^{i} 'get stronger') + Natural Perfective (*окрепнуть*^{p} 'get stronger')
- Activity (*скрипеть*^{i} 'squeak') + Complex Act (*поскрипеть*^{p} 'squeak (for a while)') + Single Act (*скрипнуть*^{p} 'squeak (once)')
- Activity (*щипать*^{i} 'pinch/pluck') + Natural Perfective (*о(б)щипать*^{p} 'pinch/pluck') + Specialized Perfective (*выщипать*^{p} 'pluck out') + Complex Act (*пощипать*^{p} 'pinch/pluck (for a while)') + Single Act (*щипнуть*^{p} 'pinch/pluck (once)')
- Activity (*дуть*^{i} 'blow') + Specialized Perfective (*раздуть*^{p} 'inflate') + Complex Act (*подуть*^{p} 'blow (for a while)') + Single Act (*дунуть*^{p} 'blow (once)')
- Activity (*дремать*^{i} 'doze') + Complex Act (*подремать*^{p} 'doze (for a while)')

The cluster model accommodates aspectual oddities such as Bi-aspectual verbs and motion verbs (Janda forthcoming a, b and c). Bi-aspectual verbs have two main types of cluster structures in which the Activity and Natural Perfective are syncretic and both Complex Acts and Single Acts are excluded, as in these examples:

- Activity (*активизировать*^{i} 'activate') + Natural Perfective (*активизировать*^{p} 'activate') + Specialized Perfective (*переактивизировать*^{p} 'reactivate')
- Activity (*ликвидировать*^{i} 'liquidate') + Natural Perfective (*ликвидировать*^{p} 'liquidate')

Motion verbs have all four types of Perfectives, although their clusters are suppletive, due to the contributions of the Determined and Non-determined stems:

- Activity (*идти*^i/*ходить*^i 'go/walk') + Natural Perfective (*пойти*^p 'go/walk') + Specialized Perfective (*уйти*^p 'leave (by foot)') + Complex Act (*походить*^p 'walk (for a while)') + Single Act (*сходить*^p 'go (by foot someplace and back once)')

The cluster model at this point gives us various descriptions, telling us *what* we find in the Russian aspect system, namely what kinds of Perfectives there are and how they are arranged in clusters. What the cluster model has not yet addressed is *why* we find these patterns. Why are there four types of Perfectives? Why is there an Implicational Hierarchy, and why is it arranged the way it is? Why does the verb *писать*^i 'write' have the cluster structure it has and why is that cluster structure different from what we find for *вязать*^i 'tie', *работать*^i 'work', *крепнуть*^i 'get stronger', *скрипеть*^i 'squeak', *щипать*^i 'pinch/pluck', *дуть*^i 'blow', and *дремать*^i 'doze'? Why are no Complex Act and Single Act Perfectives formed from Bi-aspectual verbs? Why do motion verbs form all types of Perfectives, but use their Determined stems for Natural and Specialized Perfectives, but their Non-determined stems for Complex Act and Single Act Perfectives? The answers involve the lexical meanings of verbs and how they relate to three metaphors that motivate the patterns found in the Russian aspectual system.

3. The Three Metaphors that Motivate Russian Aspect

The three metaphors (or, to be more precise, three pairs of metaphors) that motivate Russian aspect are as follows: 1) PERFECTIVE IS A DISCRETE SOLID OBJECT vs. IMPERFECTIVE IS A FLUID SUBSTANCE; 2) COMPLETABILITY IS TRAVEL TO A DESTINATION VS. NON-COMPLETABILITY IS MOTION; 3) A SINGULARIZABLE ACTIVITY IS A GRANULAR SUBSTANCE vs. A NON-SINGULARIZABLE ACTIVITY IS A LIQUID.

The metaphors that motivate Russian aspect form a coherent system that is consistent with what is known about the role of metaphor in language. As has been well-established (Lakoff and Johnson 1980 and 1999; Lakoff 1987; Janda 2000a), a metaphor is a mapping from a (usually concrete) source domain to a (usually abstract) target domain. Thus *my love is a fire* maps source domain experiences with fire onto target domain emotional experiences. Metaphor plays a crucial role in organizing grammatical categories such as case and aspect in Russian (Janda 2000b; 2002a–f; 2003; 2004 a–b; Janda and Clancy 2002 and 2006). All three metaphors underlying aspect can be subsumed under the conceptual metaphor EVENTS ARE OBJECTS, which is a specific version of the apparently universal TIME IS SPACE metaphor

(Haspelmath 1997). Logically, the three metaphors are nested within each other, such that the first one (PERFECTIVE IS A DISCRETE SOLID OBJECT vs. IMPERFECTIVE IS A FLUID SUBSTANCE) is the largest, most comprehensive, and each successive metaphor (COMPLETABILITY IS TRAVEL TO A DESTINATION VS. NON-COMPLETABILITY IS MOTION; and A SINGULARIZABLE ACTIVITY IS A GRANULAR SUBSTANCE vs. A NON-SINGULARIZABLE ACTIVITY IS A LIQUID) defines a subset within the domain of the previous one. In this way the three metaphors also motivate the Implicational Hierarchy.

It should be remembered that all three metaphors are conventionalized in Russian grammar. This means that although the metaphors are motivated by human experience, their precise range of application cannot be predicted by human experience alone. A good example is the comparison of English *in(to)* (used with locations construed as containers) and *on(to)* (used with locations construed as open surfaces) with their closest equivalents in Russian, *в* and *на*. When the use of these spatial prepositions is metaphorically extended to the domain of time, we find some stark disparities in the way that English and Russian have conventionalized the TIME IS SPACE metaphor. Whereas in English one says *on Monday* (construing a day as a surface), in Russian it is *в понедельник*, literally 'in(to) Monday' (construing a day as a container). The situation is reversed with weeks, where we get *in this week* in English (container), but *на этой неделе*, literally 'on this week' in Russian. The point is that the metaphors described below motivate, but do not perfectly predict the cluster structures of verbs based on their lexical meanings. This is due to the conventional status of metaphor in grammar, meaning that on some occasions where human experience can yield multiple interpretations, a given language has conventionalized only a subset of the options. Still, the correlations are remarkably good and yield few counter-intuitive exceptions. The behavior of these metaphors in Russian and the way they motivate (but do not precisely predict) grammatical structure is consistent with what is known about the role of metaphor in grammar in general (cf. Lakoff 1987: 146ff; Janda 2000a: 5).

3.1 Metaphor 1: Discrete Solid Object vs. Fluid Substance

The first metaphor marks the most obvious distinction in the aspectual system, as well as the first juncture in the Implicational Hierarchy, namely Perfective vs. Imperfective (Activity). This metaphor is based on our human experience of physical matter, yielding the mappings PERFECTIVE IS A DISCRETE SOLID OBJECT and IMPERFECTIVE IS A FLUID SUBSTANCE. Metaphor 1 invokes no less than fourteen parameters motivating the designation of Perfective events as bounded, unique and impenetrable, as opposed to Imperfective events as unbounded, continuous and penetrable. However, Metaphor 1 has already been described in detail (Janda 2003; 2004b; 2006), and beyond differentiating an Imperfective Activity from all other

items in the Implicational Hierarchy, Metaphor 1 does not differentiate among the different types of Perfectives. In order to motivate the formation of various kinds of Perfectives and therefore various cluster structures, we must focus on Metaphors 2 and 3.

3.2 Metaphor 2: Travel vs. Motion

The second metaphor zeroes in on a single parameter from Metaphor 1, namely Streamability, according to which a Perfective event must arrive as an entire chunk (like a discrete solid object), whereas an Imperfective event can appear gradually (like a fluid). Within this parameter, a fluid Imperfective has two options, one representing Travel, as we experience a river which flows, and the other representing mere Motion or fluidity, as we experience a lake, where the water may move, but is not going anywhere. The motion verbs are the archetypal instantiation of this distinction, where the Determined stems like *идти*[i] 'go/walk' designate Travel toward a destination, as opposed to the Non-determined stems like *ходить*[i] 'go/walk', which designate mere Motion.

The human experience of moving through space interpretable as either Travel or Motion serves as the source domain for a metaphor that is ubiquitous in the verbal lexicon and motivates the bulk of the distinctions observed among Russian Perfectives. This metaphor is: COMPLETABILITY IS TRAVEL TO A DESTINATION vs. NON-COMPLETABILITY IS MOTION. Metaphor 2 thus uses the motion verbs as the standard for whether other verbs are construed as Completable or Non-completable (or both). For example,

> *сестра пишет*[i] *статью*
> 'my sister is writing an article'

is Completable because it is parallel to

> *брат идет*[i] *в магазин*
> 'my brother is walking to the store'.

In other words, everything my sister is doing is bringing her closer to the goal of finishing her article, just as every step my brother is taking is bringing him closer to the store. By contrast,

> *сестра работает*[i] *в кабинете*
> 'my sister is working in her office'

is Non-completable because it is parallel to

брат ходит^i по парку
'my brother is walking in the park'.

Working does not in and of itself lead anywhere, much like walking in the park, which does not have a destination.

Whereas the motion verbs are unambiguous in terms of Completability (Determined stems are Completable, Non-determined stems are Non-completable), non-motion verbs can have a variety of construals. Some verbs can only be construed as Completable; for example, *крепнуть^i* 'get stronger' is like *идти^i* 'go/walk', since there is no part of getting stronger that does not entail actually making progress toward getting stronger. Some verbs can only be construed as Non-completable; for example *скрипеть^i* 'squeak' is like *ходить^i* 'go/walk', since squeaking does not lead to any conclusion. Many verbs are ambiguous and can be construed as either Completable or Non-completable depending upon the situation they describe. For example, whereas

сестра пишет^i статью
'my sister is writing an article'

is Completable,

сестра пишет^i научную фантастику
'my sister is writing/writes science fiction'

is Non-completable (this is a job description and thus parallel to *работать^i* 'work'). Finally, there are verbs that are clearly Non-completable, but can be rendered Completable if the Activity they describe is given a certain direction. Prefixes can sometimes give Activities a certain direction. For example, whereas

сестра работает^i в кабинете
'my sister is working in her office'

is Non-completable,

сестра перерабатывает^i статью
'my sister is revising her article'

is Completable (parallel to *пишет^i статью* 'is writing an article').

Metaphor 2, in its application to the non-motion verbs, distinguishes among three of the four types of Perfectives: Natural Perfectives, Specialized Perfectives, and

Complex Act Perfectives. Since motion verbs are the motivating force for Metaphor 2, they are a good place to begin an examination of the role of Completability in the Russian aspect system. Observe which Perfectives are formed from which stem (Determined or Non-determined):

- Activity (*идти*^{i}/*ходить*^{i} 'go/walk') + Natural Perfective (*пойти*^{p} 'go/walk') + Specialized Perfective (*уйти*^{p} 'leave (by foot)') + Complex Act (*походить*^{p} 'walk (for a while)') + Single Act (*сходить*^{p} 'go (by foot someplace and back once)')

The Natural and the Specialized Perfectives are formed from the Completable Determined stem, whereas the Complex Act and Single Act Perfectives are formed from the Non-completable Non-determined stem. Although non-motion verbs do not overtly mark Completability, they follow the same rule, given their distribution of construals. Thus, if a verb has a Completable construal, it can have a Natural Perfective, as we see in *крепнуть*^{i} – *окрепнуть*^{p} 'get stronger', *писать*^{i} – *написать*^{p} 'write', and *вязать*^{i} – *связать*^{p} 'tie'. If a verb can gain a Completable construal when modified by a prefix, it can have one or more Specialized Perfectives (along with secondary Imperfectives derived therefrom), as in *писать*^{i} 'write' – *подписать*^{p} 'sign', *вязать*^{i} 'tie' – *развязать*^{p} 'untie', *работать*^{i} 'work' – *переработать*^{p} 'revise', *дуть*^{i} 'blow' – *раздуть*^{p} 'inflate' and *щипать*^{i} 'pinch/pluck' – *выщипать*^{p} 'pluck out'. If a verb has a Non-completable construal, it can have one or more Complex Act Perfectives, as in *писать*^{i} 'write' – *пописать*^{p} 'write (for a while)', *работать*^{i} 'work' – *поработать*^{p} 'work (for a while)' – *проработать*^{p} 'work (for a given duration)', *скрипеть*^{i} 'squeak' – *поскрипеть*^{p} 'squeak (for a while)' – *заскрипеть*^{p} 'begin to squeak' and *дремать*^{i} 'doze' – *подремать*^{p} 'doze (for a while)' – *продремать*^{p} 'doze (for a given duration)' – *задремать*^{p} 'begin to doze'.

If a verb lacks the requisite construal, it cannot form the corresponding Perfectives. *Работать*^{i} 'work', *скрипеть*^{i} 'squeak', *дуть*^{i} 'blow' and *дремать*^{i} 'doze' cannot be construed as Completable, precluding the formation of Natural Perfectives. In the case of *скрипеть*^{i} 'squeak' and *дремать*^{i} 'doze', we have Activities that cannot be made Completable even with the help of a prefix, so Specialized Perfectives are not formed either. *Крепнуть*^{i} 'get stronger' and *вязать*^{i} 'tie' lack a Non-completable construal and cannot form Complex Act Perfectives.

The lexical meaning of a verb plays a role in determining the structure of that verb's aspectual cluster. If a verb can describe something that metaphorically "goes somewhere", leading to a culmination, then that verb (usually) has a Natural Perfective. If a modification of the verb can add a destination to the Activity, Specialized Perfectives are a possibility. And if a verb describes an Activity that one

can engage in without making progress toward a goal, it is possible to get Complex Act Perfectives. These tendencies are stated as possibilities because Russian has not conventionalized all of the options that human experience might sanction. One could easily envision a situation, practicing knot-tying, for example, in which it would make sense to have a verb like $^?$*повязать*^{p} 'tie (for a while)'. Though there is nothing preventing a native speaker from creating it if the need arises, this Complex Act Perfective does not normally exist in Russian; it simply has not been conventionalized, perhaps due to the existence of *повязать*^{p} 'tie' as an alternative Natural Perfective for *вязать*^{i} 'tie'. Exceptional gaps like this are uncommon, but they do exist. The selection of Perfectives available in a given cluster is anything but arbitrary, but it is subject to conventionalization and thus not strictly predictable.

Metaphor 2 establishes a significant portion of the Implicational Hierarchy, by distinguishing among Natural, Specialized, and Complex Act Perfectives. At this point, the Hierarchy has this much structure:

Activity > (Natural Perfective/Specialized Perfective) > Complex Act…

Metaphor 3 motivates the Special Act Perfectives and their role in the system and finalizes the ordering of Perfectives in the Implicational Hierarchy.

3.3 Metaphor 3: Granularity vs. Liquidity

Metaphor 2 distinguishes between Travel and Motion, based upon the two options available for a fluid substance, which can either stream, like a river, or contain non-directed motion, like a lake. Metaphor 3 focuses on the latter item, the container of a fluid substance with non-directed (or variously directed) motion, and thus pertains only to Non-completable Activities. A fluid mass can be of two types: granular (cf. Russian *сыпучий* 'friable') or liquid (*жидкий*). A granular mass, like sand, consists of conceptually identical "grains", any one of which can be separated from the mass and construed as an individual. This physical experience motivates Metaphor 3: A SINGULARIZABLE ACTIVITY IS A GRANULAR SUBSTANCE vs. A NON-SINGULARIZABLE ACTIVITY IS A LIQUID. Metaphor 3 provides the motive for the Single Act Perfective which describes a single cycle of an Activity that is composed of many conceptually identical cycles which do not lead to any result.

Once again, the motion verbs serve as the point of departure. The cluster for *идти*^{i}/*ходить*^{i} 'go/walk' contains the Single Act Perfective *сходить*^{p} 'go (by foot someplace and back once)', which is formed from the Non-determined stem, and this is what we would expect since Singularizability pertains only to Non-Completable Activities. The role of the Single Act Perfective can be illustrated by comparing it to the corresponding Activity. The phrase

брат ходит^i в магазин
'my brother walks to the store'

describes a regularly repeated event, from which a single cycle is extracted by the Single Act Perfective in

брат сходит^p в магазин
'my brother will walk to the store (and back once)'.

Non-motion verbs that have Non-completable construals are also eligible for Singularizability if they can describe repeated cycles or units that bring the agent back to its original state. Examples include *скрипеть^i* 'squeak' – *скрипнуть^p* 'squeak (once)', *щипать^i* 'pinch/pluck' – *щипнуть^p* 'pinch/pluck (once)', and *дуть^i* 'blow' – *дунуть^p* 'blow (once)'. These Single Act Perfectives are built from verbs with a Non-completable construal that describe repeatable homogeneous actions. Verbs that lack a Non-completable construal, like *крепнуть^i* 'get stronger' and *вязать^i* 'tie', cannot form a Single Act Perfective. However, there are also many verbs that have a Non-completable construal and do form Complex Act Perfectives, but do not form Single Act Perfectives. Examples are *работать^i* 'work', *дремать^i* 'doze' and *писать^i* 'write', which describe Activities that are more like liquids and cannot be broken down into conceptually identical units, which is why they do not form Single Act Perfectives.

Metaphor 3 gives us the last piece of the puzzle needed to complete the Implicational Hierarchy:

Activity > (Natural Perfective/Specialized Perfective) > Complex Act > Single Act

The presence of a Single Act Perfective is dependent upon the prior existence of a Complex Act because GRANULAR vs. LIQUID is relevant only to the FLUID subset of options distinguished by Metaphor 2. The nested relationship between the three metaphors motivates the ordering of the Perfectives in the Implicational Hierarchy.

Metaphor 3 is conventionalized, and thus it is possible to find some rare exceptions that might seem counter-intuitive. Both *греметь^i* 'thunder' and *мурлыкать^i* 'purr' describe rumbling sounds, and both form Complex Act Perfectives: *погреметь^p* 'thunder (for a while)' and *помурлыкать^p* 'purr (for a while)'. Given the perspective of human experience, one might expect thundering to be more "granular" than purring. However, Russian has conventionalized the opposite pattern: *$^?$гремнуть^p* 'thunder (once)' is practically non-existent, whereas *мурлыкнуть^p* 'purr^p (once)' is robustly attested. For whatever reason, purring is construed as a granular Activity in Russian, but thundering cannot usually receive this

construal. Though most verbs behave as expected, one has to be aware of the presence of such "exceptions".

3.4 Metaphor and Lexical Semantics

The lexical meaning of a verb plays a powerful role in motivating the arrangement of its aspectual cluster in Russian. The verb *работать*[i] 'work' describes an Activity that does not necessarily "go anywhere", and that is not conceived of as a series of repetitions of identical units, so the formation of Complex Act Perfectives is well-motivated, but the formation of Single Act Perfectives is not. Overall, this logic works remarkably well, but there are exceptions.

Although we would not normally want to recognize the existence of a verb like [?]*работнуть*[p] 'work (once)/do a lick of work', that does not prevent ad-hoc formations, such as in this quote from Viktor Astaf'ev's *Зрячий посох* (cited in the Russian National Corpus at www.ruscorpora.ru):

> У меня кончился табак, хлеб — все кончилось и, главное, хотелось поскорей домой, прочесть черновик жене, позвонить в Москву и похвастаться Александру Николаевичу, как я тут ударно работнул.

> 'I ran out of tobacco and bread, I ran out of everything and most importantly, I felt like going home as quickly as possible to read the draft to my wife and call Moscow and brag to Aleksandr Nikolaevich about how I had done such a successful stroke of work here.'

In other words, the structure of clusters is not entirely static. Clusters represent a system that native speakers can manipulate, at least to some degree. The correlation between lexical meaning and metaphorical construal is very strong, but it only tells us what we can reasonably expect; it does not predict the exact composition of every cluster. And expansions might be possible for a creative native speaker.

The lack of precise prediction does not mean that the cluster model lacks predictive power. A test case (described in detail in Janda forthcoming c) is that of Bi-aspectual verbs. Since the Bi-aspectual verbs by definition can be used as Perfectives, they of necessity tend to describe Activities construed as Completable. The examples cited above, *активизировать*[i/p] 'activate' and *ликвидировать*[i/p] 'liquidate', are typical Bi-aspectuals. It is not possible to activate or liquidate anything without actually achieving some activating or liquidating, and thus these verbs are very similar to other Completable verbs like *крепнуть*[i] 'get stronger' and *вязать*[i] 'tie'. This should mean that we would not expect Bi-aspectual verbs to form Complex Act Perfectives. Indeed, this prediction is borne out. 555 foreign borrowings, all with the *–ова-* suffix and thus morphologically similar, were culled from the Wheeler (1972/1992) dictionary, which listed 349 of them as Bi-aspectual and 206 as

Imperfective. The base frequency and the frequency of *no-* prefixed forms (indicating Complex Act Perfectives) for each verb were found on www.yandex.ru. A statistical analysis showed a very strong correlation (p < .0001) between the designation Bi-aspectual and the lack of *no-* prefixed forms; the mean rate of *no-* prefixed forms was over five times higher for Imperfective verbs. Thus the Bi-aspectual verbs not only conform to the cluster model, but actually confirm the logic of the Implicational Hierarchy and its relationship to lexical meaning.

It is worth noting that the logic of the three nested metaphors conforms to Brøndal's Principle of Compensation, specifically in the way we would expect given the implications of markedness for cognitive linguistics (Janda 1995: 215–16). Brøndal noticed that further differentiation tends to occur within the unmarked member of a relationship, and that is exactly what we find in the cluster model. It is almost universally agreed that in Russian the Perfective is the marked aspect (Dahl 1985: 71–72; Smith 1991: 277), and further that among motion verbs, the Determined stems are marked with respect to the Non-determined stems. Metaphor 1 distinguishes the marked Perfective as a discrete solid object from the unmarked Imperfective as a fluid substance. Within the set of Imperfectives Metaphor 2 distinguishes "streaming" fluid substance from the stagnant fluid substance, prototypically instantiated as a marked Determined motion verb vs. an unmarked Non-determined motion verb. Within the set of stagnant fluid substances (likened to unmarked Non-determined motion verbs), Metaphor 3 distinguishes a marked "granular" type as opposed to an unmarked "liquid" type.

4. Conclusions

The traditional "pair" model captures only a fraction of a much more complex, but well-regulated reality. Although some "pairs" do exist, they are typically embedded in larger clusters, either as Activity + Natural Perfective in combination with other types of Perfectives, or as Specialized Perfectives with their accompanying derived secondary Imperfectives. The "pair" model has further drawbacks. It would predict Activity + Natural Perfective to be the predominant (if not exclusive) cluster structure, but that is not the case. Cluster structures that lack Natural and Specialized Perfectives contain no "pairs" at all, thus excluding all verbs of the types represented here by *скрипеть*[i] 'squeak' and *дремать*[i] 'doze'. And the "pair" model is challenged by the presence of "exceptional" types of verbs such as Bi-aspectuals and motion verbs.

The one advantage to the "pair" model is its simplicity, which may seem hard to let go of in favor of something more complicated. Although the cluster model is admittedly more complex, it is highly constrained and transparently motivated by metaphors that make its complexity largely, if not entirely, predictable. I would argue that the benefits of a model that accounts for the full range of phenomenon in a

logically structured fashion outweigh those of a simpler model that is incomplete and misleading.

The metaphorical approach taken here reveals a well-ordered, transparently motivated system, in which the effects of lexical meaning are clearly seen in the patterns of aspectual derivation. As a rule, verbs with a Completable meaning have Natural Perfectives, whereas verbs that lack this component in their meaning lack a Natural Perfective. If a prefix can give Completable contours to an Activity, it is possible to derive a Specialized Perfective and a secondary Imperfective. A verb that has a Non-completable reading can derive Complex Act Perfectives that "package" an Activity with external boundaries. If a Non-Completable meaning entails a collection of discrete granular "units", it is also possible to derive a Single Act Perfective. The conventionalized behavior of metaphor in this system is consistent with what we find in other subsystems of Russian grammar (i.e., case), and in linguistic categories in general. This metaphorical analysis provides further evidence for the cluster model of Russian aspect, since the metaphors and the patterning of aspectual derivation complement each other. Indeed it is likely that there are other systematic parallels between metaphorical motivation and morphological expression, both in Russian and in other languages.

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