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Aspectual clusters of Russian verbs*

Laura Janda

The traditional “pair” model of Russian aspect fails to distinguish among Perfectives and ignores the fact that most verbs exist in larger clusters of three or more aspectually related forms. I propose semantic parameters that account for the interaction of aspect and actionality and use them to construct a semantic map of Russian aspectual relationships. I show, using a multiply stratified sample of 283 verb clusters (including over 2000 verbs), that the composition of clusters conforms to a strict implicational hierarchy that predicts all and only the cluster types attested in Russian. The proposed model replaces aspectual “pairs” with a model that captures the more complex reality of aspectual relationships among Russian verbs and provides a hypothesis for cross-linguistic comparison.

Keywords: aspect, actionality, perfective, imperfective, semantic map, Russian

1. Introduction

Despite the long-standing tradition of describing Russian verbs as “paired” for the Perfective vs. Imperfective distinction, it is a fact that most verbs exist in larger clusters structured by aspectual relationships.¹ The purpose of this article is to develop a model of the aspectual cluster as an alternative to the traditional “pair” model, and to investigate the implications of the cluster model. As a preliminary definition of “aspectual cluster”, I offer the following:

- (1) An aspectual cluster is a group of verbs joined via transitive relationships on the basis of aspectual derivational morphology.

All verbs in a cluster are thus related (directly or indirectly) to a single lexical item. For example, if verb A is derivationally related to verbs B and C (both aspectually distinct from A), and verb B is derivationally related to verb D

(aspectually distinct from B), then together these verbs constitute a cluster containing A, B, C, and D. This definition will be refined at the close of Section 1.1, an example of a cluster of maximum complexity will be presented in 2.5, and illustrations of all extant cluster types will appear in 3.3.

I will demonstrate that the structure of Russian aspectual verb clusters is highly constrained and well-motivated. I will commence with a brief description of the traditional model of aspectual “pairs”, and introduce the various distinctions that are made within the Perfective category (1.1). Semantic maps drawn in conceptual space form the theoretical basis for the article (1.2). After determining the relevant parameters (2.1), how they can be arranged (2.2), and how they are realized by Russian morphology (2.3), I present a semantic map for Russian aspect (2.4) and demonstrate the shape of a single verb cluster on that map (2.5). I undertake an empirical study of the range of cluster shapes in Russian, describing first what data was collected and how (3.1), what the results were (3.2), and giving illustrations of how each cluster type functions (3.3). Based upon the results, I posit an implicational hierarchy for the composition of verb clusters (4). In addition, I explore the behavior of two aspectually problematic groups of verbs, the biaspectuals (5.1) and the motion verbs (5.2). In conclusion, I discuss the advantages of the cluster model over the “pair” model, and discuss the implications of the proposed semantic map (6).

1.1 Background, Terms and Conventions

The Slavic languages are famous for elaborate derivational morphology that produces aspectually distinct, yet related verbs. A given verb has inherent aspect (Perfective or Imperfective), which is obligatorily expressed by all forms of that verb. Unlike most other languages with this distinction, the Russian Perfective is functionally marked, and Imperfective is unmarked.² Prefixes (which carry lexical meaning and Perfectivize) and suffixes (most of which Imperfectivize, though there is one semelfactive Perfectivizing suffix which will be glossed as ‘once’) are affixed to verbal stems to create verbs (a process described in more detail in 2.3). Throughout this article, Russian verbs will be “captioned” in square brackets in order to give the reader access to the derivational process involved, as demonstrated in the verbs in the following paragraph. The captions are not intended to provide a precise representation of the semantics of Russian morphology; they are merely an attempt to make this morphology visible to readers unfamiliar with Russian.

The aspectual “pair” is a durable concept in Russian linguistics, as attested in major works, such as Vinogradov 1938, Šaxmatov 1941, Bondarko 1983,

Čertkova 1996, Zaliznjak & Šmelev 2000. According to the “pair” model, Russian verbs (with the exception of the defective Perfective and Imperfective isolates) exist in “pairs” consisting of a Perfective and an Imperfective partner. Thus, for example, it is claimed that Russian has a pair of verbs that express ‘write’: a Perfective *napisatʹ^p* [on-writeⁱ] and an Imperfective *pisatʹⁱ* [writeⁱ] (henceforth all verbs will be tagged with a superscript “p” for Perfective or “i” for Imperfective, and all language-specific grammatical terms are capitalized). There is no denying the existence of aspectual partnerships, but such partnerships are usually embedded in larger clusters. For example, *napisatʹ^p* [on-writeⁱ] ‘write^p’ and *pisatʹⁱ* [writeⁱ] ‘writeⁱ’ have aspectual relationships with a number of other verbs, among them: *popisatʹ^p* [awhile-writeⁱ] ‘write^p (for a while)’, *perepisatʹ^p* [re-writeⁱ] ‘rewrite^p’, *perepisyvatʹⁱ* [re-writeⁱ-Impf] ‘rewriteⁱ’, and *poperepisyvatʹ^p* [awhile-(re-writeⁱ-Impf)] ‘rewrite^p (for a while)’. My aim is to explore the structure of Russian aspectual verb clusters.

Crucial to the structure of verb clusters is the recognition that the Russian Perfective is not a monolithic category. In contrast with the Imperfective, which describes Activities, there are four types of Perfective distinguished on the basis of both semantics and morphological markers (detailed in Section 2). Among Perfectives, we can distinguish: 1) Natural Perfectives which describe the logical completion of the corresponding Imperfective Activity (and are thus denotationally equivalent to the Activity, differing from it only in terms of aspect), as illustrated by *napisatʹ^p* [on-writeⁱ] ‘write^p’ (as the completion of *pisatʹⁱ* [writeⁱ] ‘writeⁱ’); 2) Specialized Perfectives which provide enough new semantic content to motivate the further derivation of corresponding Imperfectives, as illustrated by *perepisatʹ^p* [re-writeⁱ] ‘rewrite^p’ (and the derived Imperfective *perepisyvatʹⁱ* [re-writeⁱ-Impf] ‘rewriteⁱ’); 3) Complex Acts, which consist of an Activity combined with a limit, forming verbs that describe temporally limited actions, as illustrated by *popisatʹ^p* [awhile-writeⁱ] ‘write^p (for a while)’ (which is a complex of ‘write’ + an arbitrary time limit); and 4) Single Acts, which isolate a single cycle of a repeated Activity, as in the case of *čixnutʹ^p* [sneezeⁱ-once] ‘sneeze^p (once)’ (cf. *čixatʹⁱ* [sneezeⁱ] ‘sneezeⁱ’).

Given these distinctions among the aspectual types of Russian verbs, it is now possible to refine the definition of the aspectual cluster as follows:

- (2) An aspectual cluster is a group of verbs joined via transitive relationships on the basis of aspectual derivational morphology, including all Activity, Natural Perfective, Specialized Perfective, Complex Act, and Single Act verbs that are thus related to a single lexical item.

In 2.1–2.5 we will see how the parameters of a proposed semantic map disambiguate the aspectual types of Russian verbs, and in Section 3 we will see how these types form the structure of aspectual clusters.

1.2 Conceptual spaces and semantic maps

Haspelmath (2003, 1997a, 1997b) and van der Auwera (and his co-authors, cf. van der Auwera & Plungjan 1998, van der Auwera & Dobrushina & Goussev 2004, van der Auwera & Malchukov 2005, van der Auwera & Temurcu 2006) have provided explicit descriptions of the semantic map model, which Croft (2001, 2003; cf. also Croft & Cruse 2004) has enhanced by relating the semantic map (specific to a given language) to conceptual space (universal to human cognition). The semantic map model can be traced also to the work of Anderson (1982) and Kemmer (1993).

Croft distinguishes a **conceptual space** which provides a pre-linguistic universal backdrop for the semantic map. The global semantic properties relevant to a given domain constitute the dimensions of the corresponding conceptual space. A linguist draws a semantic map in the dimensions of conceptual space, much as the cartographer draws the map of a continent in the dimensions of latitude and longitude. For example, Croft (2001: 317) constructs a conceptual space for voice and transitivity based upon two parameters: the salience vs. absence of the transitive agent and the transitive patient. Within this space he maps the continuum of constructions from the unaccusative (anticausative), where the transitive agent is maximally absent and the transitive patient is maximally salient, through the passive, inverse, active, antipassive, and finally the unergative, where the transitive agent is maximally salient and the transitive patient is maximally absent.

A **semantic map** is a geometrical arrangement of grammatical functions in a given domain. In other words, a semantic map lays out the relative positions of grammatical functions in conceptual space. A semantic map addresses three issues: (1) polyfunctionality and the relatedness of functions, (2) facilitation of cross-linguistic comparison, and (3) implicational predictions.

1. A semantic map shows how a group of grammatical functions are related to each other. Physical closeness iconically represents functional closeness in a semantic map and lines show which functions are directly connected to each other. According to the Semantic Map Connectivity Hypothesis (Croft & Cruse 2004: 322; Croft 2001: 96; Croft 2003: 134; termed “contiguity requirement” by van der Auwera & Temurcu 2006), the functions

subsumed by polyfunctional grams must be contiguous. This means that it should be possible to diagram the functions of a given grammatical unit in a given language as contiguous regions of the semantic map.

2. In addition, a semantic map both results from and serves as a tool for cross-linguistic comparison. Ideally one needs input from a dozen or more genealogically diverse languages in order to devise a stable semantic map, although the overlapping distribution of different grams of a single language may suffice to construct a provisional semantic map (Haspelmath 2003: 217–8). However, if any other language provides contrary evidence, the semantic map may be falsified. A semantic map is a valuable tool for diagramming the similarities and differences among various languages.
3. Ultimately, once a semantic map has been constructed, it “embodies a series of implicational universals” (Haspelmath 2003: 230). On a mundane level, the structure of the semantic map implies that certain functions will co-occur in grams, whereas others will not. On a more profound level, the semantic map reveals the organizational structure that the processes of human perception and conception (or “ception”, cf. Talmy 2000: 99–175) impose on human experience. Simplicity increases the predictive power of a semantic map: a powerful semantic map has relatively few connections in a space of relatively few dimensions. Conversely, if each function is connected to all other functions in a multidimensional space, the semantic map makes no predictions except to show that the functions are related (Haspelmath 2003: 218).

Haspelmath’s (1997: 102–8) map of how languages express ‘time when’ can be used to illustrate the operation of a semantic map, as reproduced in Figure 1.

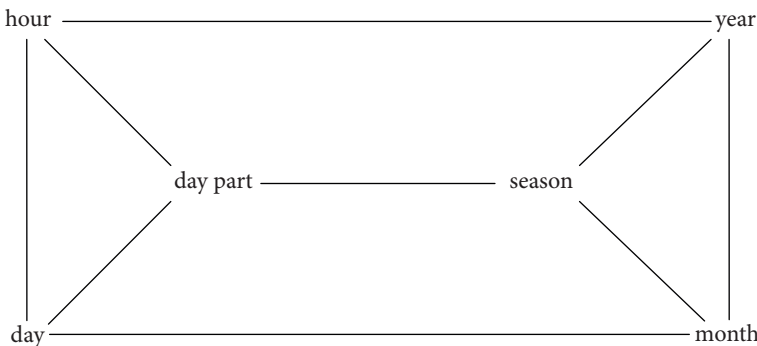


Figure 1. The implicational map for simultaneous location markers (adapted from Haspelmath 1997: 106)

The lines in the map indicate which functions are contiguous to each other. English uses three prepositions, *on*, *at*, and *in*, for such time expressions, as in: *on Monday*, *at 3 o'clock*, *at night*, *in the morning*, *in May*, *in the spring*, *in 2005*. These prepositions can be diagrammed as inhabiting regions compatible with the structure of the map: *on* is used with days, *at* is used with hours and day parts (which are connected by a line), and *on* (which overlaps with *at* for day parts) is used with day parts, seasons, years, and months (all of which are connected by lines). Haspelmath then shows that all fifty-three genetically diverse languages in his survey likewise conform to the structure of the map with one questionable exception. Thus all time expressions for any given language can be diagrammed as contiguous regions in the semantic map.

In addition to the power to visually represent the relatedness of functions, make cross-linguistic comparisons, and discover implicational hierarchies, a semantic map has further advantages. A semantic map makes it possible to identify and compare polyfunctional grams without making a particular commitment to a given form-meaning hypothesis, so it works just as well for monosemistic, polysemistic, and homonymistic interpretations (Haspelmath 2003: 212). The implicational hierarchies embedded in a semantic map will also generally reflect historical paths of grammaticalization (Haspelmath 2003: 233–6; Croft & Cruse 2004: 322; Croft 2001: 101–2; van der Auwera & Temurcu 2006). The use of semantic maps is still relatively new, and researchers may yet encounter drawbacks. Haspelmath (2003:236), Nessel & Enger (2002), and van der Auwera & Temurcu (2006) note the possibility of “doughnut patterns” in semantic maps, where a gram does not occupy a contiguous region due to historical innovation or homonymy. It might also be the case that in some domains, different speech communities simply recognize different patterns of relatedness among grammatical functions that may be incommensurate (for a discussion of such appeals to a revision of Whorfianism, see Gentner & Goldin-Meadow 2003). For example, Talmy’s (2000) famous distinction between verb-framed and satellite-framed languages may indicate that some languages organize motion verbs according to manner of motion while others organize them according to paths of motion, which might involve two types of incommensurate maps. Though many domains certainly yield semantic maps with cross-linguistic validity, some domains may have more than one semantic map, each valid only for some, but not all languages.

I will present a model that aspires to be a semantic map of aspect, based upon dimensions widely accepted as universal. I will begin by identifying a minimal group of semantic dimensions from among those proposed for aspect by researchers for a variety of languages. The semantic dimensions interact to

determine the gross structure of a conceptual space. Within this conceptual space, I will draw a semantic map of aspect based on the data of formal distinctions made in Russian. Thus on a macroscopic scale this model does utilize cross-linguistic realities, but on the level of the semantic map itself, the functions are distinguished based on one language. This semantic map therefore falls short of the ideal of twelve or more genealogically unrelated languages, at least at the level of clearly comparable detail. Perhaps we can excuse this for now due to the fact that “typologically oriented research on tense and aspect is relatively scarce” (Dahl 2000: 3; cf. also Tournadre 2004: 12). More specifically, the aspectual behavior of Russian (and the Slavic languages) is typologically unusual (Dahl 1985: 21, 27, 69, 74, 86; Tournadre 2004: 11; Bertinetto & Delfitto 2000: 189) in that aspect is independent of tense, Imperfective is the unmarked value, and aspectual markers function as derivational morphemes. These facts make comparison at the level of specificity required for a semantic map rather difficult, due to the lack of commensurate grams. The semantic map I will propose can be treated as a working hypothesis for the purpose of facilitating cross-linguistic comparisons (cf. van der Auwera & Temurcu 2006), one that can be amended or rejected as needed in the future. The map proposed here fortunately makes some clear predictions, for it can be drawn in only three dimensions, and its five functions are not all connected to each other, yielding several strong constraints. I will suggest that this map is much more explanatory than the map suggested by the traditional aspectual pair model, which contains only two functions (Perfective and Imperfective) that are connected to each other. The semantic map the traditional model yields is vacuous because it cannot describe any constraints and cannot differentiate among the various Perfectives.

The purpose of this article is to identify the “minimal group of semantic dimensions” needed to account for the “formal distinctions made in Russian”, as stated immediately above. This article does not aspire to address all of the many uses of Perfective and Imperfective verbs in Russian, but is limited to analyzing the clusters formed by aspectually related verbs. Recent detailed accounts of the grammatical behavior of Russian Perfective and Imperfective verbs include Bulygina & Šmelev 1997, Janda 2004 (and references cited therein).

2. The semantic map of Russian aspect

I will build the semantic map of Russian aspect in stages. First I will identify the major semantic dimensions that scholars of aspect have proposed. Next I will examine how the semantic dimensions interact with each other and arrange

those dimensions accordingly to construct a conceptual space. Within the conceptual space, I will map the overlapping patterns of Russian aspectual grams to show how the conceptual space is carved up. I will then propose a semantic map of Russian. Finally, I will explore the pathways along this map that are exploited by various verb clusters.

The semantic map of aspect that I will propose presents a multidimensional approach of the type advocated by Sasse (2002 and 2006), and incorporates the view held by contemporary scholars (for example Bertinetto & Delfitto 2000, Tatevosov 2002, and Tournadre 2004) that aspect and actionality (also known as “Aktionsart”) interact. In the proposed semantic map, the dimension that represents the Slavic aspectual distinction Perfective vs. Imperfective, corresponding to Sasse’s (2002: 203) ASPECT₁, interacts with two dimensions that represent actionality distinctions, corresponding to Sasse’s ASPECT₂.³

2.1 The semantic dimensions of aspect

States are gnomic situations that express timeless properties instead of events, and will not prove relevant to this study since they are not encoded by Russian morphology. In principle, every Russian verb, Perfective or Imperfective, can be used in a gnomic construction.⁴ Mehlig (2006: 237, 249) asserts that stativity stands outside the category of aspect. In Smith’s (1991) system of features, “static”, the defining feature of States, is not combinable with any other feature; all other situations are “dynamic”. Given the lack of integration between States and other situations, and the fact that States do not have a gram (or set of grams) associated with them in Russian, I will eliminate them and their dimension from consideration here. Alternatively, one could understand States as inhabiting another parallel plane, a further dimension of the conceptual space.

I will propose three semantic dimensions for aspect and actionality distilled from the various options in the scholarly literature: CLOSED vs. OPEN, COMPLETABLE vs. NON-COMPLETABLE, and DURATIVE vs. INSTANTANEOUS.

CLOSED vs. OPEN. This is the only semantic dimension I propose that does not relate directly to Smith’s (1991: 28–30) “conceptual temporal properties”, yet the characterization of situations as “closed” vs. “open” pervades her book. Smith (1991: 100) neatly summarizes the distinction this way: “Informationally perfective viewpoints are *closed*, in the sense that they present situations as complete with both endpoints. Imperfectives are *open*, in the sense that they present situations as incomplete, with neither endpoint”. A parallel and almost equally persistent pair of descriptors that Smith (1991: 5) uses for the same distinction is “full” vs. “partial” view of a situation, reminiscent of Isačenko’s

(1960: 132–133) “parade metaphor” according to which Perfective is like seeing the parade as a whole entity from the grandstand, and Imperfective is like being a participant in the middle of the parade. CLOSED vs. OPEN aspect goes by many other names, among them: boundedness (Avilova 1976, Jakobson 1957/1971, Padučeva 1996, and Talmy 2000), totality (Forsyth 1970, Bondarko 1971, Comrie 1976, Dickey 2000, and Maslov 1965), delimitation (Bondarko 1971, Tournadre 2004), closure (Timberlake 1982), and demarcatedness/dimensionality (van Schooneveld 1978). For the purposes of Russian this dimension is ultimately synonymous with Perfective vs. Imperfective.

COMPLETABLE vs. NON-COMPLETABLE. This dimension of actionality is often referred to as “telic vs. atelic” (cf. Dahl 1985, Smith 1991, Bertinetto & Delfitto 2000, Tatevosov 2002, Tournadre 2004). Smith (1991: 45–49) also cites this as a distinction between “completion” and “termination”. Mehlig (1994, 1997, 2006) uses the terms “transformative” vs. “non-transformative” to describe this distinction between situations, and Croft (in preparation) terms it “directed activity” vs. “undirected activity”. A situation is COMPLETABLE if it has a goal that can be fulfilled, and thus naturally ends in a change of state. Verbs can be ambiguous along this dimension: *write a dissertation* is a COMPLETABLE situation with a goal that includes a change of state, whereas *write* (intransitive) is usually NON-COMPLETABLE. Some verbs, such as *work*, are inherently NON-COMPLETABLE; they describe things that one does for a time and then stops doing without reaching a goal or producing a change of state.

As we shall see, the COMPLETABLE vs. NON-COMPLETABLE dimension interacts with both parts of the CLOSED vs. OPEN dimension in Russian, and this interaction is predicted by the multidimensional approach to aspect and actionality. Bertinetto & Delfitto (2000: 193) point out that “[t]elic predicates fulfill their inherent character only in perfective situations”. In order to include both situations that have reached a telos as well as those that presume the existence of a telos (available, but not reached), I use the term COMPLETABLE. Thus COMPLETABLE can describe both CLOSED (Perfective) and OPEN (Imperfective) situations. CLOSED situations may be either COMPLETABLE, like *napisat^P pis'mo* [on-writeⁱ] ‘write^P a letter’ and *vybrosit^P musor* [out-throw^P] ‘throw out^P garbage’; or NON-COMPLETABLE, like *porabotat^P* [awhile-workⁱ] ‘work^P (for a while)’ and *čixnut^P* [sneezeⁱ-once] ‘sneeze^P (once)’. OPEN situations can be COMPLETABLE, like *pisatⁱ pis'mo* [writeⁱ] ‘writeⁱ a letter’; or NON-COMPLETABLE, like *rabotatⁱ* [workⁱ] ‘workⁱ’ and *čixatⁱ* [sneezeⁱ] ‘sneezeⁱ’; or ambiguous, like *vybrasyvatⁱ musor* [out-throwⁱ-Impf] ‘throw outⁱ garbage’ and *pisatⁱ pis'ma* [writeⁱ] ‘writeⁱ letters’. The various manners of motion (‘walk’, ‘run’, ‘fly’, etc.) are all OPEN situations, but they have two sets of verbs, one that describes

COMPLETABLE situations, such as *idti^{i-det}* [walk^{i-det}] ‘walkⁱ (with a goal)’, and one that describes NON-COMPLETABLE situations, such as *xodit^{i-nondet}* [walk^{i-nondet}] ‘walkⁱ (without a goal)’⁵.

DURATIVE VS. INSTANTANEOUS. This is a further dimension of actionality that joins Smith’s (1991) features “durative” and “instantaneous” into a single distinction. Čertkova (1996), Bondarko (1971), and Padučeva (1996) all point to the significance of this distinction for Russian aspect. Bertinetto & Delfitto (2000: 190) recognize “durative vs. punctual” as one of the “basic oppositions” of actionality, alongside “telic vs. atelic” (cf. also Tatevosov 2002).

Russian derivational morphology codes the interaction of the DURATIVE VS. INSTANTANEOUS dimension with the CLOSED and NON-COMPLETABLE dimensions. A situation that is both CLOSED and NON-COMPLETABLE can be either DURATIVE, like *porabotat^p* [awhile-workⁱ] ‘work^p (for a while)’ or INSTANTANEOUS, like *čixnut^p* [sneeze^{i-once}] ‘sneeze^p (once)’. Whereas all OPEN situations have duration, some can express an ongoing duration, which is the usual interpretation of a phrase like *pisatⁱ pisⁱmo* [writeⁱ] ‘writeⁱ a letter’, whereas other OPEN situations express the cyclic repetition of instantaneous events, as in *čixatⁱ* [sneezeⁱ] ‘sneezeⁱ’.

2.2 The conceptual space of aspect

The next task is to arrange the three semantic dimensions to create the coordinates for a conceptual space. In order to accomplish this, we must take into account the ways in which the three dimensions interact. The Russian facts mentioned above hint at how these dimensions might be organized. CLOSED vs. OPEN appears to be the most fundamental distinction, since at some point along this continuum all verbs are divided into Perfective vs. Imperfective. CLOSED situations interact with all the values of both the COMPLETABLE vs. NON-COMPLETABLE and DURATIVE vs. INSTANTANEOUS dimensions. OPEN situations can be ambiguous along the COMPLETABLE vs. NON-COMPLETABLE dimension, but in the case of motion verbs they do mark this distinction. The DURATIVE vs. INSTANTANEOUS dimension is confined to interaction with situations that are both CLOSED and NON-COMPLETABLE. In order to capture these interactions, I suggest the following coordinates along three dimensions:

- CLOSED VS. OPEN will correspond to periphery vs. center
- COMPLETABLE VS. NON-COMPLETABLE will correspond to the vertical axis;
and
- DURATIVE VS. INSTANTANEOUS will correspond to the horizontal axis.

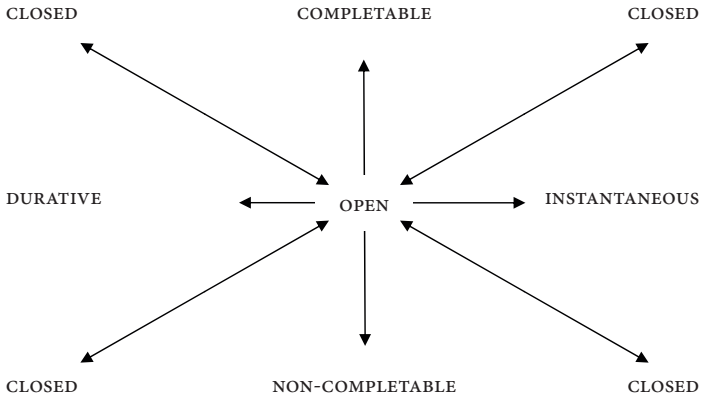


Figure 2. The conceptual space of aspect

This arrangement, diagrammed in Figure 2, allows all three parameters to interact.

Figure 3 indicates the relative positions of various aspectual situations in this conceptual space:

- Accomplishments (CLOSED, COMPLETABLE, and DURATIVE);
- Achievements (CLOSED, COMPLETABLE, and INSTANTANEOUS);
- Complex Acts (CLOSED, NON-COMPLETABLE, and DURATIVE);
- Single Acts (CLOSED, NON-COMPLETABLE, and INSTANTANEOUS); and
- Activities (OPEN and some variation for the other dimensions).

We now need to observe how some actual grams are distributed in this space.

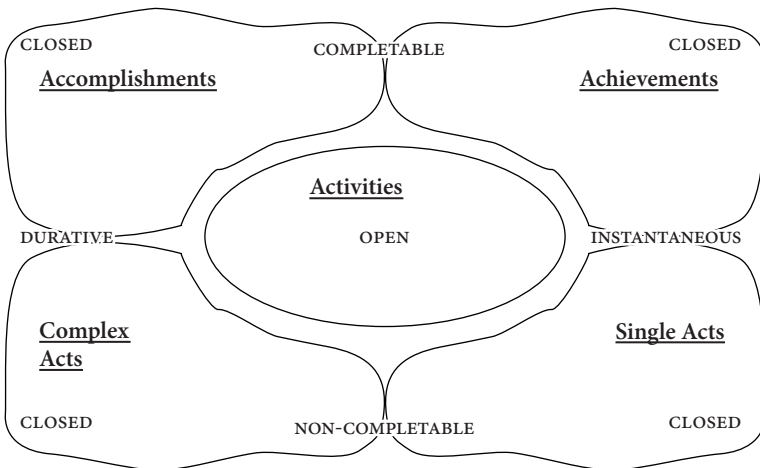


Figure 3. The conceptual space of aspect and the situation types

2.3 How Russian grams carve up the conceptual space of aspect

Russian has a complex system of aspectual grams that inhabit various overlapping territories in the proposed conceptual space. I will diagram the (usually simplex) stems and the various prefixes and suffixes that can be added to stems. Mehlig (2006: 271) has pointed out that there is no aspectual behavior of Russian verbs that can distinguish Accomplishments from Achievements, and since my data confirm this claim, I will refer instead to Completion Acts, which are the union of Accomplishments and Achievements.

Base verbs (usually simplex stems). The majority of Russian verbs are built from simplex stems, and the majority of simplex stems describe Activities in Russian, such as *kormitⁱ* [feedⁱ] ‘feedⁱ’. However, there are also numerous simplex stems that describe Completion Acts, such as *dat^p* [give^p] ‘give^p’, and there are also Russian verbs that are not built from a simplex stem, such as *umeret^p* ‘die^p’.⁶ The survey of Russian verb clusters presented in Section 3, based on a representative sample of verbs, provides an indication of these distributions: 275 of the base verbs in the survey verbs are simplex and 10 are not.⁷

Prefixes. Russian has eighteen verbal prefixes, all of which productively form Perfective verbs (cf. Isačenko 1960: 149).⁸ The prefixes are associated primarily with the designation of Completion Acts, but they can also produce Complex Acts and Activities. The addition of the prefix *vy-* [out-] to the stem *kormitⁱ* [feedⁱ] ‘feedⁱ’ yields the Completion Act *vykormit^p* [out-feedⁱ] ‘rear^p (feed up to adulthood)’, and the addition of *vy-* [out-] to *dat^p* [give^p] ‘give^p’ yields *vydat^p* [out-give^p] ‘issue^p, give away^p, betray^p’. The best example of a prefix that produces Complex Acts is *po-* [awhile-], which when added to *kormitⁱ* [feedⁱ] ‘feedⁱ’ gives us *pokormit^p* [awhile-feedⁱ] ‘feed^p (for a while)’. When added to the stems of Non-determined motion verbs, such as *xodit^{i-nondet}* [walk^{i-nondet}] ‘walkⁱ’, most prefixes will give us another Activity (which is however COMPLETEABLE, unlike the simplex stem); thus the addition of *vy-* [out-] produces *vyxoditⁱ* [out-walk^{i-nondet}] ‘exitⁱ’.⁹

*Suffixes -aj/-jaj, -vaj, and -yvaj/-ivaj.*¹⁰ This group of suffixes reliably produces Activities which can describe both ongoing situations and continuous repetitions. The suffix *-vaj* transforms *dat^p* [give^p] ‘give^p’ into *davatⁱ* [giveⁱ-Impf] ‘giveⁱ’, and *vydat^p* [out-give^p] ‘issue^p, give away^p, betray^p’ into *vydavatⁱ* [out-give^p-Impf] ‘issueⁱ’. Similarly, *-ivaj* joins with *vykormit^p* [out-feedⁱ] ‘rear^p (feed up to adulthood)’ to yield *vykarmlivatⁱ* [out-feedⁱ-Impf] ‘rearⁱ (feed up to adulthood)’.

The semelfactive -nu suffix. This suffix appears in the formation of verbs that express Single Acts. An example is *ščipnut^p* [pinch/pluckⁱ-once] ‘pinch, pluck^p (once)’, derived from *ščipatⁱ* [pinch/pluckⁱ] ‘pinch, pluckⁱ.¹¹

2.4 A proposed semantic map of aspect

Figure 4 summarizes the distributional pattern of Russian grams in the conceptual space of aspect. In this figure, we see that simplex stems provide two kinds of verbs: verbs that are OPEN, as well as verbs that are both CLOSED and COMPLETABLE. The addition of a prefix can yield verbs that are CLOSED and COMPLETABLE, or CLOSED and NON-COMPLETABLE and DURATIVE. Additionally, prefixes when added to Non-determined motion verbs can give us verbs that are OPEN. The Imperfectivizing suffixes yield only verbs that are OPEN, and the semelfactive *-nu* suffix provides only verbs that are CLOSED, NON-COMPLETABLE and INSTANTANEOUS.

Russian morphology subdivides the conceptual space into four regions that correspond to Imperfective Activities and three types of Perfective acts: Completion Acts, Complex Acts, and Single Acts. This arrangement corresponds to Mehlig’s (2006: 271) claim that neither Russian morphology nor syntax differentiate Accomplishments from Achievements; it also confirms Mehlig’s

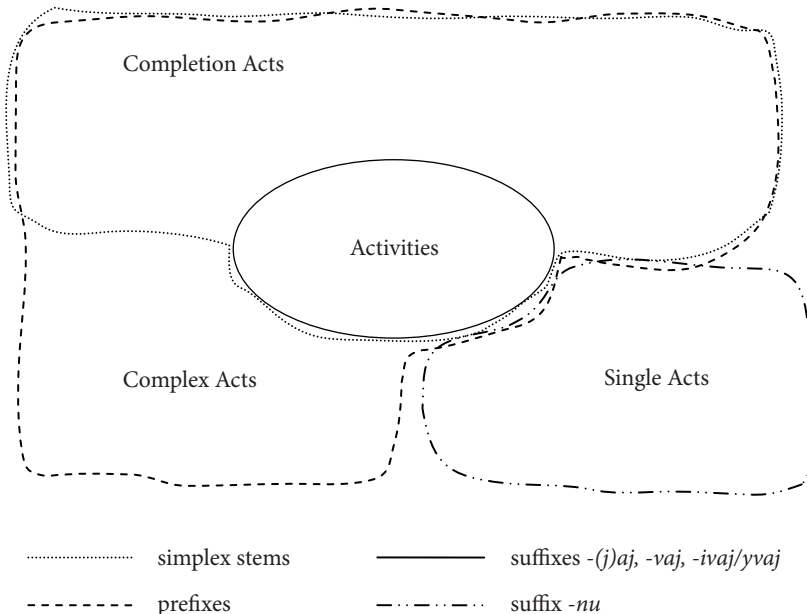


Figure 4. The distributional pattern of Russian grams in the conceptual space of aspect

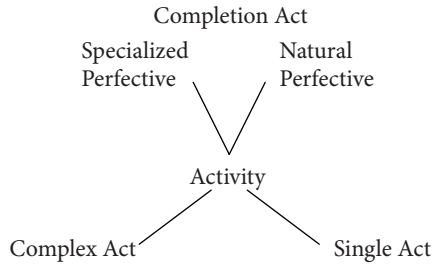


Figure 5. Proposed Semantic Map of Russian Aspect

conviction that there are several types of Perfectives in Russian, each with their own distinctive grammatical behavior. Given this information, it is now possible to take the next step and draw a semantic map within the parameters of the conceptual space. I will propose the semantic map in Figure 5.

The semantic map represents the presence vs. absence of morphemes in Russian, as well as the possible combinations of morphemes, and this reveals an extra distinction in the system. Among Completion Acts, the Imperfectivizing suffixes combine only with those that describe Specialized Perfectives (and with a very few simplex Perfective stems); they do not combine with the Natural Perfectives¹². This means that our map can contain a distinction between Natural and Specialized Perfectives.

In the semantic map we see that although Activities are connected to all other situations on the map, there are no direct connections between Completion Acts, Complex Acts, and Single Acts. Activities seem to occupy a special, central place in the system. As we will see, there are strong restrictions on the actual distribution of situation types in clusters of Russian verbs. The connections demonstrate the functional relationships among the types of verbs, in accordance with Croft's "Connectivity Hypothesis" (Croft & Cruse 2004: 322; Croft 2001: 96; Croft 2003: 134) and van der Auwera & Temurcu's (2006) "contiguity requirement". The restrictions on these connections guarantee that this is a valuable, non-vacuous semantic map, in the sense described by Haspelmath (2003; see also Section 1.2). The map asserts co-occurrence restrictions, predicting that a Perfective verb is related to an Imperfective Activity, and that no cluster should contain more than one Perfective verb in the absence of an Imperfective Activity, since there are no direct connections among the Perfectives (all such connections involve Activities). These restrictions will be further refined in the implicational hierarchy in Section 4.

2.5 An example of an aspectual cluster

The behavior of individual verb clusters can be diagrammed in the conceptual space of aspect. To illustrate an aspectual cluster we will use one of the base verbs from the survey that has the maximum number of types of Perfectives related to it, namely *ščipatʹ*ⁱ [pinch/pluckⁱ] ‘pinch, pluckⁱ’. Representative members of the cluster headed by this verb include:

- a Natural Perfective *o(b)ščipatʹ^p* [around-pinch/pluckⁱ] ‘pinch, pluck^p’;
- various Specialized Perfectives like *otščipatʹ^p* [off-pinch/pluckⁱ] ‘pinch off^p’ and *vyščipatʹ^p* [out-pinch/pluckⁱ] ‘pluck out^p’, which form the derived Activities *otščipyvatʹⁱ* [off-pinch/pluckⁱ-Impf] ‘pinch offⁱ’ and *vyščipyvatʹⁱ* [out-pinch/pluckⁱ-Impf] ‘pluck outⁱ’ and in turn the Complex Acts *pootščipyvatʹ^p* [awhile-(off-pinch/pluckⁱ-Impf)] ‘pinch off^p (for a while)’ *povyščipyvatʹ^p* [awhile-(out-pinch/pluckⁱ-Impf)] ‘pluck out^p (for a while)’;
- a Complex Act *poščipatʹ^p* [awhile-pinch/pluckⁱ] ‘pinch, pluck^p (for a while)’ and the derived iterative Activity *poščipyvatʹⁱ* [(awhile-pinch/pluckⁱ)-Impf] ‘pinch, pluckⁱ (for a while) repeatedly’; and
- a Single Act *ščipnutʹ^p* [pinch/pluckⁱ-once] ‘pinch, pluck^p (once)’.

This aspectual cluster could be diagrammed as in Figure 6.

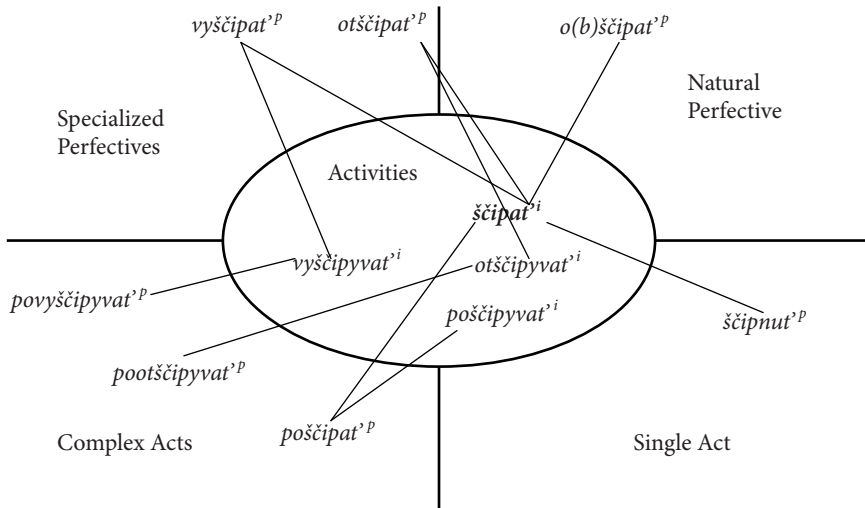


Figure 6. The verb cluster headed by *ščipatʹⁱ* [pinch/pluck] ‘pinch, pluckⁱ’ in the conceptual space of aspect

Note: This figure gives only a representative sample of the verbs of this cluster, which contains several more Specialized Perfectives, along with the Activities derived therefrom via Imperfectivization, and the Complex Acts subsequently derived from those Activities.

This diagram demonstrates the enriched information available with the proposed model of conceptual space. One can clearly see that there are several types of Perfectives, and that their aspectual behavior is different. The mapping of a single verb cluster inspires many questions:

Do all verb clusters have the same structure or are there variations?

If there are variations, are there patterns?

Are there structures that do not exist?

What are the overall implications and constraints of the system?

The only way to answer these questions is by mapping a representative sample of verbs and analyzing the data. As we shall see in Sections 3 and 4 below, the analysis of data reveals compelling patterns for the structure of Russian verb clusters.

3. Data on the Russian verb clusters

In this section I will describe the types of data collected and the methodology. I will then give an overview of the results, illustrated with an example of a cluster representing each existing type.

3.1 Types of data and methods of collection

The first task was to sample the population of Russian verbs in a way that would represent the variance in that population as strongly as possible. There exist no standard semantic classifications of Russian verbs, so it is not possible to construct a sample relying solely on semantic criteria. There is, however, a legacy of morphological classification of Russian verbs (dating back at least to scholarship on Old Church Slavonic, cf. Leskien 1909), and morphological shape is known to correlate to semantic characteristics. For example, verbs in *-ej-* are intransitive verbs describing ‘becoming’, verbs in *-i-* tend to be transitive factitive verbs, verbs meaning ‘act like’ are all *-aj-* verbs (cf. these and many other semantic associations listed in Isačenko 1960: 42–60). One can reason that by sampling all the morphological types, one should also get a good sample of various semantic types. To this end, I stratified the population to represent both productive and unproductive (closed-class) verbs, and then within that stratified the population according to each morphological type of verb, and sampled from within all stratifications. I deliberately oversampled the closed-class population. This method yielded a sample that is more variant than (or at least as variant as) the entire population, thus capturing the most variation

available. This type of sampling ensures full representation of the closed-class type and gives evidence that what I found holds across the entire population. More concretely this means that I culled verbs (henceforth referred to as “base verbs”) from Townsend’s (1975: 98–112) inventory of all morphological types of Russian verbs. Townsend lists virtually all of the unproductive and irregular stems, and gives generous samples of the productive types. Since the inventory of closed-class verbs in Russian is well-established, this list would have been virtually identical if culled from any other source, (such as Karcevski 1922, Jakobson 1948, Isačenko 1960, Švedova *et al.* 1980, Nessel 1998). For purposes of “noise reduction”, I removed from this survey the following types of data:

- base verbs that did not appear in Ožegov’s dictionary (on the assumption that such verbs are sufficiently rare as to be unrepresentative);
- biaspectuals (due to potential ambiguity of data; but cf. Section 5.1 where I show that they do conform to the overall model);
- Determined and Non-determined motion verbs (because they add an extra layer of aspectual complexity that might confuse the initial survey; but cf. Section 5.2, where I show that the motion verbs also conform to the overall model).

This yielded a total of 285 base verbs, 268 of which were Imperfective and 17 of which were Perfective. The next step was to determine the structure of the cluster headed by each of these verbs. This was done by exploring what combination of Activity, Natural Perfective, Specialized Perfective(s), Complex Act, and Single Act could be associated with each base verb. More specifically, the methodology was as follows:

Activity. All Imperfective simplexes and derived Imperfectives were designated Activities. Perfective base verbs were recognized as Natural Perfectives (most could add further prefixes), and the Imperfectives derived directly from the Perfective base verbs were recognized as their corresponding Activities. The same relationship was also assumed for verb clusters based on two simplexes¹³. The designation of the relationship between an Activity and a Natural Perfective was matched to the information in Ožegov. So, for example, an Imperfective simplex like *plakat*ⁱ [cryⁱ] ‘cryⁱ’ designates an Activity. A Perfective simplex like *dat*^p [give^p] ‘give^p’ is a Natural Perfective associated with the Activity *davat*ⁱ [give^p-Impf] ‘give^p’. In a suppletive relationship, a verb like *brat*ⁱ [takeⁱ] ‘takeⁱ’ was identified as an Activity, with *vzjat*^p [take^p] ‘take^p’ as its Natural Perfective. Where dual simplexes occur, a verb like *brosat*ⁱ [throwⁱ] ‘throwⁱ’ designates an Activity and a verb like *brosit*^p [throw^p] ‘throw^p’ designates the Natural Perfective.

Natural Perfective. Simplex Imperfectives (the vast majority of simplex verbs are Imperfective, and 94% of the verbs in the initial survey are Imperfective) were looked up in Ožegov's dictionary, which lists Perfectives if they are denotationally equivalent to the Imperfective entries. If Ožegov listed a Perfective (or more than one), that verb (or verbs) was designated the Natural Perfective. If Ožegov did not list a Perfective, it was assumed that this simplex did not have a Natural Perfective.

Specialized Perfective(s). The base verb (usually the simplex stem) was accessed in Zaliznjak's (1977)¹⁴ grammatical dictionary to determine whether it formed any Specialized Perfectives. It was necessary to eliminate the prefixed Perfectives that express Complex Acts and focus only on whether the stem produces one or more Specialized Perfectives. This determination could only be made with confidence after the identification of the Natural Perfective and Complex Act(s). The purpose of this task was to establish whether a given verb cluster contained Specialized Perfectives or not. Some types of base verbs cannot be used to form Specialized Perfectives, but for those that do, Specialized Perfectives are an open class, and dictionaries and native speakers do not agree on any exact list of possible vs. impossible Specialized Perfectives, because "new" ones can be formed as needed.

Complex Act. The task here was to determine whether a Perfective expressing a Complex Act could be formed from the base verb. By far the most robust way to form verbs expressing Complex Acts is by using the *po-* [awhile-] prefix. However, the mere existence of a *po-* [awhile/along-] prefixed Perfective is no guarantee of the presence of a Complex Act. Mehlig (1996: 99–101) asserts that a *po-* [awhile/along-] prefixed Perfective may express either a Natural Perfective, or a Complex Act, or both. Many verbs use the *po-* [awhile/along-] prefix to form their Natural Perfective. In some cases this means that there is no Complex Act (as in the case of *potrebovat'*^P [along-needⁱ] 'need^P' which is merely the Natural Perfective of *trebovat'*ⁱ [needⁱ] 'needⁱ'), although rarely it means that the *po-* [awhile/along-] prefixed verb is polysemous, providing both the Natural Perfective and the Complex Act (as in the case of *podumat'*^P [along/awhile-thinkⁱ] 'think^P, think^P (for a while)', which serves as both the Natural Perfective and Complex Act derived from *dumat'*ⁱ [thinkⁱ] 'thinkⁱ'). Very often the *po-* [awhile-] prefix represents only a Complex Act (as in the case of *podremat'*^P [awhile-dozeⁱ] 'doze^P (for a while)', which is a Complex Act derived from *dremat'*ⁱ [dozeⁱ] 'dozeⁱ'). Furthermore, the *po-* [awhile-] prefixed Complex Acts are only infrequently listed in dictionaries, and are (like Specialized Perfectives) often formed in an ad-hoc fashion by speakers. These factors made it impossible to determine the status of a Complex Act based on

dictionaries, so the internet was recruited to establish whether a Complex Act existed and to make sure that it was distinct from any existing *po-* prefixed Natural Perfective. Search engines made it possible to locate examples that would give an unambiguous reading: for example, the use of the *po-* [awhile-] prefixed verb in collocation with a durational adverbial (such as *nekotoroe vremja* ‘for a while’, or *odnu minutu* ‘for a minute’)¹⁵.

Single Act. Zaliznjak’s (1974) *Obratnyj slovar’* (Reverse Dictionary) marks *-nu* suffixed verbs as “*odn.*” “semelfactive” (= Single Act), or “*sv.*” “Perfective”, or both (this information is not included in the 1977 dictionary). I consulted this dictionary to determine whether a given base verb had a corresponding Single Act Perfective verb, coded as “*odn.*” “semelfactive”. Thus, for example, the existence of a Single Act verb corresponding to *ščipat’ⁱ* [pinch/pluckⁱ] ‘pinch, pluckⁱ’, was confirmed by locating *ščipnut’^p* [pinch/ pluckⁱ-once] ‘pinch, pluck^p (once)’ in the *Obratnyj slovar’* and noting that it is coded as “*odn.*” “semelfactive”.

What each cluster citation contains. The survey of aspectual clusters of verbs cites the existence or non-existence of all five types of verbs identified above: Activity, Natural Perfective, Specialized Perfective, Complex Act, and Single Act. Most instances resemble the *ščipat’ⁱ* [pinch/pluckⁱ] ‘pinch, pluckⁱ’ type illustrated in 2.5 in that the base verb is a simplex Imperfective Activity, and the Natural Perfective, Specialized Perfective(s), Complex Act(s), and Single Act — if they exist — are formed by prefixation or, in the last case, the *-nu* suffix. In instances where the base verb is a Natural Perfective, as in *obresti^p* [discover^p] ‘discover^p’ or *vzjat’^p* [take^p] ‘take^p’, the citation includes the denotationally equivalent Imperfective Activity, whether it is a derived Imperfective, as in the case of *obretat’ⁱ* [discover^p-Impf] ‘discoverⁱ’, or suppletive, as in the case of *brat’ⁱ* [takeⁱ] ‘takeⁱ’.

The maximum citation thus consists of one Activity verb, one Natural Perfective, two Specialized Perfectives (since this is potentially a large group), one Complex Act, and one Single Act. The purpose of the citation is to establish the structure of existing verb clusters, not to create exhaustive lists of all verbs contained in a given cluster. Exhaustive listings of verbs would be unwieldy, and, given the ad-hoc open-class nature of Specialized Perfectives and Complex Acts, such lists could never be definitive. The citations will furthermore exclude redundant items that can easily be predicted to exist. This means that derived Imperfectives from both Specialized Perfectives and Complex Acts will not be represented in the citations, though they are of course presumed to exist in the clusters. Thus Imperfectives such as *otščipyvat’ⁱ* [off-pinch/pluckⁱ-Impf] ‘pinch offⁱ’ and *vyščipyvat’ⁱ* [out-pinch/pluckⁱ-Impf] ‘pluck outⁱ’, derived from the Specialized Perfectives *otščipat’^p* [off-pinch/pluckⁱ] ‘pinch off^p’ and *vyščipat’^p*

[out-pinch/pluckⁱ] ‘pluck out^p’ are not represented in the citations. Forms like *poščipyvatⁱ* [(awhile-pinch/pluckⁱ)-Impf] ‘pinch, pluckⁱ (for a while) repeatedly’, derived from the Complex Act *poščipat^p* [awhile-pinch/pluckⁱ] ‘pinch, pluck^p (for a while)’, are likewise absent from the lists (but presumed to exist, as per Johanson 2000: 56 and Isačenko 1960: 279–80). What Mehlig (2006) refers to as “rehomogenized” Complex Acts are not listed in the citations and their status is marginal: they are never listed in dictionaries, and appear to be created ad-hoc by speakers relatively rarely, rather than being a stable part of a verb cluster. “Rehomogenized” Complex Acts such as *pootščipyvat^p* [awhile-(off-pinch/pluckⁱ-Impf)] ‘pinch off^p (for a while)’ and *povyščipyvat^p* [awhile-(out-pinch/pluckⁱ-Impf)] ‘pluck out^p (for a while)’ are reasonably well-attested on the internet, but they represent spontaneous additions to the verb cluster, not a core part of it.

Whenever data is collected, there is inevitably a certain amount of interpretation involved in the collection, and this survey of verb clusters was typical in that respect. Efforts to make data collection objective and subject to operational definitions were thwarted by various untidy realities, and choices had to be made. For instance, for some verbs, Ožegov does offer a Natural Perfective, but it relates only to a subset of the meanings of the verb. This is problematic if the Natural Perfective relates to only one meaning, and that meaning is not the main meaning of the verb. For example, Ožegov lists three meanings for the base verb *torgovatⁱ* [trade/askpriceⁱ]: 1. conduct trade, 2. be open for business, 3. ask the price of something (colloq.). He lists two Natural Perfectives, but they are relevant only to meaning 3: *pirtorgovat^p* [at-askpriceⁱ] and *storgovat^p* [down-askpriceⁱ]. However, these Natural Perfectives are not directly related to the Activity described by *torgovatⁱ* [tradeⁱ] in meanings 1 and 2, which are the meanings that motivate the Specialized Perfectives (like *vytorgovat^p* [out-tradeⁱ] ‘gain^p by haggling, make a profit^p’ and *rastorgovat^p* [apart-tradeⁱ] ‘sell out^p’) or the Complex Act (*potorgovat^p* [awhile-tradeⁱ] ‘trade^p (for a while)’). In such an instance, it was decided that the verb cluster of *torgovatⁱ* [tradeⁱ] ‘trade^p’ does not contain a Natural Perfective, but consists only of an Activity verb, Specialized Perfectives, and a Complex Act. Another way to state this is that the verb cluster survey included only the cluster relevant to the first two meanings of *torgovatⁱ* [trade/askpriceⁱ], but did not include the cluster relevant to the third meaning. In general the survey focused on the primary meanings of the base verbs (usually the first meaning listed in Ožegov).

The identification of verbs that express Complex Acts as opposed to Natural Perfectives and Specialized Perfectives was arbitrated on the basis of copious internet data, as described above. This was more complicated when a base

verb had several Perfectives formed with prefixes that commonly express Complex Acts. For example, Ožegov lists no Natural Perfective for *xrapetʹ* [snoreⁱ] ‘snore^p’, and Zaliznjak (1977) lists only three prefixed Perfectives: *zaxrapetʹ*^p [begin-snoreⁱ], *poxxrapetʹ*^p [awhile-snoreⁱ], *proxrapetʹ*^p [through-snoreⁱ]. Internet data confirms that all three express Complex Acts, not Completion Acts (and are therefore not Specialized Perfectives), best glossed as: ‘begin to snore^p’, ‘snore^p (for a while)’, and ‘snore^p (through/during)’. Finally, one has to recognize the fact that the information in dictionaries may not be consistent.

All of these factors guarantee that the data gathered for this survey of verb clusters contain some margin of error (though it may be hard to quantify). However, the large number of verb clusters and the stratification of the sample to represent all morphological types should reduce whatever distortion error might have introduced. And, as it turns out, the patterns are so compelling that minor perturbations of error would be unlikely to make much difference in the overall results.

3.2 Overview of results of verb cluster survey

I will give a brief overview of the results here, and discuss the implications of these results in more detail in Section 4. Table 1 outlines the distribution of cluster types.

There are five aspectually distinct types of verbs expressing: Activity, Natural Perfective, Specialized Perfective, Complex Act, and Single Act. These verb types are the components of verb clusters in Russian. Theoretically five items can compose thirty-one different combinations, which means that there could be thirty-one different structures to Russian verb clusters. However, that is not the case. Most of the theoretically possible types, nineteen of them, are not attested in this survey. Three combinations are represented by over fifty clusters each and collectively account for over half of the verbs in the survey. Five combinations are less common, with only fifteen to twenty-six clusters, each representing less than ten percent of the verbs in the survey. Three types are relatively rare, having only six or seven clusters (about two percent each). One type is very rare, with only one cluster. As we will see, collectively, the types that do exist point to a strong hierarchy in the structuring of verb clusters.

Four of the types that do not exist might not be logically possible, namely those containing a Specialized Perfective in the absence of either an Activity or a Natural Perfective (since without at least one of these, it is impossible to determine whether a Perfective is a Specialized Perfective or not). One type that found no representatives in the survey is actually known to exist: the type with

Table 1. Distribution of 283 Russian verb clusters

Number of clusters	Structure of cluster type
50 or more verb clusters:	
56	Activity + Natural Perfective + Specialized Perfective + Complex Act
53	Activity + Natural Perfective + Specialized Perfective
51	Activity + Specialized Perfective + Complex Act
15–26 verb clusters:	
26	Activity + Complex Act
23	Activity + Specialized Perfective + Complex Act + Single Act
20	Activity + Natural Perfective + Specialized Perfective + Complex Act + Single Act
18	Activity + Natural Perfective
15	Activity + Complex Act + Single Act
6–7 verb clusters:	
7	Activity
7	Activity + Specialized Perfective
6	Activity + Natural Perfective + Complex Act
1 verb cluster:	
1	Activity + Natural Perfective + Complex Act + Single Act
0 verb clusters but known to exist as a rare phenomenon:	
0	Natural Perfective
0 verb clusters:	
0	Activity + Single Act
0	Activity + Natural Perfective + Single Act
0	Activity + Specialized Perfective + Single Act
0	Activity + Natural Perfective + Specialized Perfective + Single Act
0	Natural Perfective + Specialized Perfective
0	Natural Perfective + Complex Act
0	Natural Perfective + Single Act
0	Natural Perfective + Specialized Perfective + Complex Act
0	Natural Perfective + Specialized Perfective + Single Act
0	Natural Perfective + Complex Act + Single Act
0	Natural Perfective + Specialized Perfective + Complex Act + Single Act
0	Specialized Perfective
0	Specialized Perfective + Complex Act
0	Specialized Perfective + Single Act
0	Specialized Perfective + Complex Act + Single Act
0	Complex Act
0	Complex Act + Single Act
0	Single Act

only a Natural Perfective. There are at least fourteen recognized “perfectiva tantum” verbs like *uceletʹ*^p [survive^p] ‘survive^p’.¹⁶ Although these verbs have no immediate aspectual relatives (they are isolates), morphologically they betray a history that probably involved a larger cluster, because they have the shapes of stems with prefixes and suffixes, not the shapes of simplex stems. In other words, it seems likely that the Perfective isolates are the remnants of clusters that were historically larger.

Overall, the data of the survey indicate that three cluster types dominate the verbal lexicon, five other types are fairly common, and all others are rare or non-existent. In the next subsection I will present verbs to illustrate all of the existing cluster types.

3.3 Citations of extant verb clusters

The purpose of the citations is to provide concrete demonstrations of the various verb cluster types that are attested. This will give some flesh to the numerical data of the survey, and add depth to the discussion of implications in Section 4. The presentation of cluster types follows the order of frequency in Table 1.

As outlined in 3.1, the citations below include no more than two Specialized Perfectives for any cluster, though many more may exist. The Complex Act is represented by the presence of a *po-* prefixed verb in these examples, though other verbs expressing Complex Acts may exist in the same cluster. Most clusters are grouped around a simplex Imperfective verb, but often the same cluster type can be formed on the basis of a Perfective or a suppletive set of verbs. Examples of all of these types will be presented.

3.3.1 *The three dominant cluster types*

The three cluster types that represent most verbs in Russian (collectively they account for over 56% of the clusters in the survey) share some characteristics that give them coherence as a larger group. They all contain a total of three or four elements, two of which are verbs that express Activities and Specialized Perfectives, further combined with either a natural Perfective or a Complex Act or both. All of these cluster types exclude verbs expressing Single Acts.

Activity (*pitʹ*ⁱ [drinkⁱ] ‘drinkⁱ’) + Natural Perfective (*vypitʹ*^p [out-drinkⁱ] ‘drink^p’) + Specialized Perfective (*vpitʹ*^p [in-drinkⁱ] ‘absorb^p’, *zavitʹ*^p [cover-drinkⁱ] ‘wash down^p’) + Complex Act (*popitʹ*^p [awhile-drinkⁱ] ‘drink^p (for a while)’). This is a large and heterogeneous group, dominated by high-frequency verbs, such as *dumatʹ*ⁱ [thinkⁱ] ‘thinkⁱ’, *mytʹ*ⁱ [washⁱ] ‘washⁱ’, *pisatʹ*ⁱ [writeⁱ]

‘writeⁱ’, and *čitatⁱ* [readⁱ] ‘readⁱ’. One cluster of this type is based on a Perfective, and consists of the Activity *prinimatⁱ* [take^P-Impf] ‘take, receive’, Natural Perfective *prinjat^P* [take^P] ‘receive^P’, Specialized Perfectives *predprinjat^P* [under-take^P] ‘undertake^P’ and *vosprinjat^P* [up-take^P] ‘perceive^P’, and the Complex Act *poprinimat^P* [awhile-take^P-Impf] ‘take^P (for a while)’. Four clusters of this type are based on suppletive or dual simplex relationships, such as the Activity *brosatⁱ* [throwⁱ] ‘throwⁱ’, with the Natural Perfective *brosit^P* [throw^P] ‘throw^P’, Specialized Perfectives *vybrosit^P* [out-throw^P] ‘throw out^P’ and *perebrosit^P* [across-throw^P] ‘throw over^P’ (note that Specialized Perfectives are also formed from the simplex Imperfective, as in *razbrosat^P* [apart-throwⁱ] ‘scatter^P’), and the Complex Act *pobrosat^P* [awhile-throwⁱ] ‘throw^P (for a while)’.

Activity (*vjazatⁱ* [tieⁱ] ‘tieⁱ’) + Natural Perfective (*svjazat^P* [together-tieⁱ] ‘tie^P’) + Specialized Perfective (*privjazat^P* [to-tieⁱ] ‘attach^P’, *razvjazat^P* [apart-tieⁱ] ‘untie^P’). This group of verbs is also semantically heterogeneous, including generic actions such as *krytⁱ* [coverⁱ] ‘coverⁱ’, sudden actions such as *gasnutⁱ* [gooutⁱ] ‘go outⁱ’, verbs of becoming such as *slabnutⁱ* [weakenⁱ] ‘weakenⁱ’, and verbs expressing needs and desires, such as *želatⁱ* [desireⁱ] ‘desireⁱ’. Six clusters of this type are based on a simplex Perfective, like the Activity *davatⁱ* [give^P-Impf] ‘giveⁱ’ with the Natural Perfective *dat^P* [give^P] ‘give^P’ and Specialized Perfectives *vydat^P* [out-give^P] ‘issue^P’ and *razdat^P* [apart-give^P] ‘distribute^P’. Four clusters of this type contain suppletive verbs, such as the Activity *bratⁱ* [takeⁱ] ‘takeⁱ’, with the Natural Perfective *vzjat^P* [take^P] ‘take^P’ and Specialized Perfectives *sobrat^P* [together-takeⁱ] ‘collect^P’ and *ubrat^P* [away-takeⁱ] ‘remove^P’. Other suppletive examples express positioning, such as the clusters surrounding *saditⁱ/sjaⁱ/sest^P* [sit^{i/P}] ‘sit down^{i/P}’ and *klastⁱ/položit^P* [lay^{i/P}] ‘lay down^{i/P}’. Furthermore, we should note that the Determined motion verbs, which were excluded from the survey but will be discussed in Section 5.2, belong in this common cluster type.

Activity (*plakatⁱ* [cryⁱ] ‘cryⁱ’) + Specialized Perfective (*vyplakat^P* [out-cryⁱ] ‘cry^P out, obtain^P by crying’, *oplakat^P* [around-cryⁱ] ‘mourn over^P’) + Complex Act (*poplakat^P* [awhile-cryⁱ] ‘cry^P (for a while)’). All examples of this cluster type are based on a simplex Imperfective that describes something one can do for a while without having a goal for completion, such as *žitⁱ* [liveⁱ] ‘liveⁱ’, *ljubitⁱ* [loveⁱ] ‘loveⁱ’, *molčatⁱ* [besilentⁱ] ‘be silentⁱ’, *litⁱ* [pourⁱ] ‘pourⁱ’, *terpetⁱ* [rubⁱ] ‘rubⁱ’, *boletⁱ* [hurtⁱ] ‘hurtⁱ’.

3.3.2 Cluster types that are less common, yet well-attested

All attested cluster types that contain a Single Act verb appear in this grouping, and all cluster types that contain a Single Act verb also contain a Complex Act verb.

Activity (*stonatⁱ* [moanⁱ] ‘moanⁱ’) + **Complex Act** (*postonat^p* [awhile-moanⁱ] ‘moan^p (for a while)’). These clusters are all based on an Imperfective simplex, and many of them refer to the production of sounds, such as *bormotatⁱ* [mutterⁱ] ‘mutterⁱ’, *murlykatⁱ* [purrⁱ] ‘purrⁱ’ and *blejatⁱ* [bleatⁱ] ‘bleatⁱ’; some refer to physical presence, such as *torčatⁱ* [protrudeⁱ] ‘protrudeⁱ’ and *prisutstvovatⁱ* [atexistⁱ] ‘be presentⁱ’; and a few express behaviors, such as *drematⁱ* [dozeⁱ] ‘dozeⁱ’, *borot’sjaⁱ* [struggleⁱ-self] ‘struggleⁱ’, and *besedovatⁱ* [converseⁱ] ‘converseⁱ’. Two of the verbs in this group do not form *po-* [awhile-] Perfective Complex Acts, but do have Complex Act verbs formed with other prefixes: *rđetⁱ* [redglowⁱ] ‘glow redⁱ’, with the Complex Act *zardet^p* [begin-redglowⁱ] ‘begin glowing red^p’, and *rokatatⁱ* [rumbleⁱ] ‘rumbleⁱ’, with the Complex Acts *zarokotat^p* [begin-rumbleⁱ] ‘begin rumbling^p’ and *prorokotat^p* [through-rumbleⁱ] ‘rumble^p (for a time)’. Although they are missing from the *Obratnyj slovar’*, *bormotnut^p* [mutterⁱ-once] ‘mutter^p (once)’ and *murlyknut^p* [purrⁱ-once] ‘purr^p (once)’ are well-attested on search engines, and thus *bormotatⁱ* [mutterⁱ] ‘mutterⁱ’ and *murlykatⁱ* [purrⁱ] ‘purrⁱ’ might actually belong to the cluster type consisting of Activity + Complex Act + Single Act.

Activity (*dutⁱ* [blowⁱ] ‘blowⁱ’) + **Specialized Perfective** (*vdut^p* [in-blowⁱ] ‘blow in^p’, *razdut^p* [apart-blowⁱ] ‘inflate, fan^p’) + **Complex Act** (*podut^p* [awhile-blowⁱ] ‘blow^p (for a while)’ + **Single Act** (*dunut^p* [blowⁱ-once] ‘blow^p (once)’). All of these verbs describe cyclic repetitions, such as *lizatⁱ* [lickⁱ] ‘lickⁱ’, *maxatⁱ* [waveⁱ] ‘waveⁱ’, and *kašljatⁱ* [coughⁱ] ‘coughⁱ’.

Activity (*gryztⁱ* [gnawⁱ] ‘gnawⁱ’) + **Natural Perfective** (*razgryzt^p* [apart-gnawⁱ] ‘gnaw^p’) + **Specialized Perfective** (*sgryzt^p* [down-gnawⁱ] ‘gnaw^p up’, *peregryzt^p* [across-gnawⁱ] ‘gnaw^p through’) + **Complex Act** (*pogryzt^p* [awhile-gnawⁱ] ‘gnaw^p (for a while)’ + **Single Act** (*gryznut^p* [gnawⁱ-once] ‘gnaw^p (once)’). This cluster type combines all the possible cluster elements. On the whole these verbs describe repetitive motions, such as *bodatⁱ* [buttⁱ] ‘buttⁱ’, *stučatⁱ* [knockⁱ] ‘knockⁱ’, *kolebatⁱ* [rockⁱ] ‘rockⁱ’, *rezatⁱ* [cutⁱ] ‘cutⁱ’, *časatⁱ* [comb/scratchⁱ] ‘combⁱ, scratchⁱ’, *ščekotatⁱ* [tickleⁱ] ‘tickleⁱ’, *kolotⁱ* [stabⁱ] ‘stabⁱ’. One cluster of this type is based on dual simplexes: Activity *xvatatⁱ* [grabⁱ] ‘grabⁱ’ with the Natural Perfective *xvatit^p* [grab^p] ‘grab^p’, the Specialized Perfectives *otxvatit^p* [off-grab^p] ‘chop^p off’ and *rasxvatat^p* [apart-grabⁱ] ‘snatch^p (to purchase)’, the Complex Act *poxvatat^p* [awhile-grabⁱ] ‘grab^p (for a while)’, and the Single Act *xvatnut^p* [grabⁱ-once] ‘grab^p (once)’.

Activity (*krepnut*ⁱ [strengthenⁱ] ‘get strongerⁱ’) + **Natural Perfective** (*okrepnut*^p [around-strengthenⁱ] ‘get stronger^p’). Nearly all of the verbs with this cluster type qualify as an aspectually unusual semantic type, referred to as “relative transformatives” by Mehlig (1994: 590), and “directed activities” by Croft (ms). Whereas most Completion Acts refer to a situation that cannot be continued once it is completed, these verbs refer to situations that do produce a change of state, but can also be continued after completion. Thus with most Completion Acts, like *on napisal*^p *knigu* ‘he [on-writeⁱ] wrote^p a book’ one cannot continue the narrative about the same situation with a statement like **on ešče boljše napisal*^p *knigu* *‘he [on-writeⁱ] wrote^p a book even more.’ However, it is entirely possible to start with a statement like *on okrep*^p ‘he [around-strengthenⁱ] got stronger^p and then continue to describe the same situation with *on ešče boljše okrep*^p ‘he [around-strengthenⁱ] got even stronger^p. The majority of verbs with this cluster type describe situations of becoming, such as *xripnut*ⁱ [hoarsenⁱ] ‘go hoarseⁱ, *gorknut*ⁱ [embitterⁱ] ‘turn rancidⁱ, *bogatet*ⁱ [enrichⁱ] ‘get richⁱ. A small number refer to human will and emotions, such as *nadejat*ⁱ [hopeⁱ-self] ‘hopeⁱ and *žalet*ⁱ [pityⁱ] ‘pityⁱ. Three of the verbs in this cluster are based on a simplex Perfective, such as *načinat*ⁱ [start^p-Impf] ‘startⁱ with the Natural Perfective *načat*^p [start^p] ‘start^p.

Activity (*xrapet*ⁱ [snoreⁱ] ‘snoreⁱ’) + **Complex Act** (*poxrapet*^p [awhile-snoreⁱ] ‘snore^p (for a while)’) + **Single Act** (*xrapnut*^p [snoreⁱ-once] ‘snore^p (once)’). Most of the verbs with this cluster type refer to sounds, such as *skripet*ⁱ [squeakⁱ] ‘squeakⁱ, *xoxotat*ⁱ [guffawⁱ] ‘guffawⁱ, *vizžat*ⁱ [squealⁱ] ‘squealⁱ. Some verbs refer to bodily movements, namely *drožat*ⁱ [trembleⁱ] ‘trembleⁱ, and to behaviors, namely *riskovat*ⁱ [riskⁱ] ‘take risksⁱ and *spekulirovat*ⁱ [speculateⁱ] ‘speculateⁱ, gambleⁱ. In addition to the eighteen verbs in the survey, the non-determined motion verbs belong in this group (cf. Section 5.2).

3.3.3 Cluster types that are relatively rare

Given the small numbers of base verbs involved (only six or seven for each of these types), it is hard to characterize these groups with any certainty, so I will just offer examples.

Activity (*predvidet*ⁱ [foreseeⁱ] ‘foreseeⁱ’). This is the only cluster type attested in the survey that consists of only one verb, a verb describing an Activity. This type is often referred to as the Imperfective isolates or the “imperfectiva tantum” verbs. Other verbs in our survey include *čajat*ⁱ [hope/expectⁱ] ‘hopeⁱ, expectⁱ, *zdravstvovat*ⁱ [thriveⁱ] ‘thriveⁱ, *zaviset*ⁱ [dependⁱ] ‘depend onⁱ.

Activity (*krepit*ⁱ [strengthenⁱ] ‘strengthenⁱ’) + **Specialized Perfective** (*skrepit*^p [together-strengthenⁱ] ‘fasten together^p, *prikrepit*^p [at-strengthenⁱ]

'attach to^P'). Other verbs with this cluster type include *gnestiⁱ* [pressⁱ] 'pressⁱ', *lipnutⁱ* [clingⁱ] 'clingⁱ', and *paxnutⁱ* [smellⁱ] 'smellⁱ'.

Activity (*pol'zovat'sjaⁱ* [useⁱ-self] 'useⁱ') + **Natural Perfective** (*vospol'zovat'sja^P* [up-useⁱ-self] 'use^P') + **Complex Act** (*popol'zovat'sja^P* [awhile-useⁱ-self] 'use^P (for a while)'). This group includes five more clusters based on simplex Imperfectives: *zvenetⁱ* [ringⁱ] 'ringⁱ', resoundⁱ, *žalovat'sjaⁱ* [complainⁱ-self] 'complainⁱ', *nočevatⁱ* [overnightⁱ] 'spend the night(s)ⁱ', and *diktovatⁱ* [dictateⁱ] 'dictateⁱ'. There is additionally one cluster of this type that is based on a Perfective, with the Activity *pokazyvatⁱ* [show^P-Impf] 'showⁱ', the Natural Perfective *pokazat^P* [show^P] 'show^P', and the Complex Act *popokazyvat^P* [awhile-(show^P-Impf)] 'show (for a while)^P'.

3.3.4 Cluster types that are very rare

One cluster type was attested by only one verb in our survey. Another was not attested in the survey, but is known to exist.

Activity (*ošibat'sjaⁱ* [aroundhitⁱ-self] 'make a mistakeⁱ') + **Natural Perfective** (*ošibit'sja^P* [aroundhit^P-self] 'make a mistake^P') + **Complex Act** (*poošibat'sja^P* [awhile-aroundhitⁱ-self] 'make a mistake^P (for a while)') + **Single Act** (*ošibnut'sja^P* [aroundhitⁱ-once-self] 'make a mistake^P (once)'). Note that there are no unprefixed forms **šibat'sjaⁱ* or **šibit'sja^P* [hit^{i/P}-self]. If there were such forms, (which one would expect, given the fact that verbs with the same root but different prefixes do exist, such as *zašibat'sjaⁱ/zašibit'sja^P* [fixhit^{i/P}-self] 'bruise oneself^{i/P}' and *ušibat'sjaⁱ/ušibit'sja^P* [downhit^{i/P}-self] 'hurt oneself^{i/P}'), this cluster would have Specialized Perfectives, and thus represent a common cluster type. The lack of a truly unprefixed simplex has distorted the apparent shape of this cluster, and this is the result of a historical change which has fused the prefix to the root.

Natural Perfective (*ucelet^P* [survive^P] 'survive^P'). This very simple cluster type, consisting of only a Perfective verb, is unattested in the survey, but known to exist. As discussed above in 3.2, Perfective isolates are rather rare and betray a more complex (not simplex) morphology.

4. Interpreting the data

The results of the verb survey suggest that there are powerful constraints in the structuring of verb clusters in Russian. Furthermore, the patterning of cluster types is clearly at odds with the prevailing traditional model of aspectual pairs.

Most of the possible cluster types are not attested at all, and only about a quarter of the possible types account for over 90% of the verbs in the survey. All of the cluster types attested in the survey contain an Activity. The presence of a Single Act verb in a cluster seems to require the presence of a Complex Act, though the reverse is not true.

These data suggest the following implicational hierarchy, where items to the left of the “>” are included in a cluster prior to items on the right, and where the items in parentheses are optional and unordered:

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

In other words, the minimal cluster contains an Activity. In addition to an Activity, a cluster may contain a Natural Perfective and/or a Specialized Perfective. Thus it is possible to have the structures: Activity, Activity + Natural Perfective, Activity + Specialized Perfective, and Activity + Natural Perfective + Specialized Perfective. Additionally, any of the aforementioned structures can be augmented by adding a Complex Act or by adding both a Complex Act and a Single Act.

This implicational hierarchy describes all and only the cluster structures attested in the survey; all of the attested clusters conform to this hierarchy and all structures that violate the hierarchy are unattested. The only exception to the implicational hierarchy is the existence of Perfective isolates, unattested in the survey but represented by *ucelet*^p [survive^p] ‘survive^p’ and thirteen other verbs in the Russian lexicon, with clusters that contain a Natural Perfective in the absence of an Activity verb.

The overall shape of the implicational hierarchy is significant. The place of Activity as the primary and most essential component of a verb cluster corresponds well to the fact that Imperfective is unmarked in Russian. In the majority of cases base verbs describe Activities, and Activities are the most basic building-block of aspectual clusters. The central role of Activities is likewise reflected in their position in the semantic map.

The optional place of the Natural Perfective and Specialized Perfective underscores the importance of the COMPLETABLE VS. NON-COMPLETABLE distinction. The clusters of verbs that can denote COMPLETABLE Activities have a different structure than the clusters of verbs that can only denote NON-COMPLETABLE Activities. Some base verbs describe Activities that are inherently NON-COMPLETABLE, such as *dremat*ⁱ [dozeⁱ] ‘dozeⁱ’ and *skripet*ⁱ [squeakⁱ] ‘squeakⁱ’. The clusters of these verbs can only be enlarged by a Complex Act, yielding *podremat*^p [awhile-dozeⁱ] ‘doze^p (for a while)’, or by a Complex Act

and a Single Act, yielding *poskripet*^p [awhile-squeakⁱ] ‘squeak^p (for a while)’ and *skripnut*^p [squeakⁱ-once] ‘squeak^p (once)’. Verbs that can describe a COMPLETEABLE Activity will have a Natural Perfective or a Specialized Perfective or both in their structures, giving them a larger number of structures often of greater complexity, even including all five types of verbs, as in the cluster of *ščipat*^{zi} [pinch/pluckⁱ] ‘pinch, pluckⁱ’ illustrated in Figure 6.

We can now compare these results to the model of aspectual pairs. The traditional model suggests that we should expect the Activity + Natural Perfective to be at least a very important, if not the predominant cluster type, but it is not. Less than 10% of the verbs in the survey show this cluster type, and furthermore, as a group they are semantically unusual, since most of them describe situations that can be continued even after the Natural Perfective is achieved. The cluster pattern suggested by the pair model, consisting of only two elements, is also uncommon. Six of the eight cluster types that are common or well-attested contain more than two elements: three contain three elements, two contain four elements, and one contains all five elements. Overall, the presence of a Specialized Perfective seems to be slightly preferred over the presence of a Natural Perfective. Of course aspectual “pairs” are also formed by Imperfective derivation, derived from Specialized Perfectives, but the Activity + Specialized Perfective cluster type is also rare in our survey. However, regardless of whether we are identifying as pairs Activity + Natural Perfective or Specialized Perfective + derived Imperfective Activity or both, the aspectual pair model denies the existence of the larger clusters in which such “pairs” are almost always embedded. The aspectual pair model cannot account for the more complex structures that are prevalent in the data. It also fails to capture the significant patterns revealed by the alternative semantic map I have presented here.

4.1 Dual Simplex and Suppletive types

Throughout the list of citations, I have noted the presence of dual simplex and suppletive types of relationships among verbs in a cluster. I have interpreted “dual simplex” in accordance with Feldstein (2005) and “suppletive” in accordance with Isačenko (1960) and Hippisley *et al.* (2004). These interpretations and the identification of which verbs meet these criteria may not be agreed upon by all scholars, but the clusters model can account for the relevant data regardless of these differences because, as argued below, the behavior of these verbs conforms to the implicational hierarchy. In other words, I recognize the various irregularities of form and have highlighted them in the data, but ultimately it does not matter where one draws the line; all of these verbs behave

according to the implicational hierarchy, whether or not one recognizes them as suppletive.

The distribution of verb forms in clusters containing dual simplexes (which can be thought of as being partially suppletive) and suppletive verbs strongly supports both the importance of the COMPLETABLE vs. NON-COMPLETABLE parameter and the pattern of the implicational hierarchy. The survey contains four clusters with dual simplexes and five clusters with suppletive verbs. Four of these nine clusters have the Activity + Natural Perfective + Specialized Perfective structure: *ložit'sjaⁱ/leč^p* [liedown^{i/p}] 'lie down^{i/p}', *sadit'sjaⁱ/sest^p* [sit-down^{i/p}] 'sit down^{i/p}', *klastⁱ/položit^p* [laydown^{i/p}] 'lay down^{i/p}', and *bratⁱ/vzjat^p* [take^{i/p}] 'take^{i/p}'. Four clusters have the Activity + Natural Perfective + Specialized Perfective + Complex Act structure: *bro^satⁱ/bro^sit^p* [throw^{i/p}] 'throw^{i/p}', *kidatⁱ/kinut^p* [throw^{i/p}] 'throw^{i/p}', *puskatⁱ/pustit^p* [let/drop^{i/p}] 'let/drop^{i/p}', and *govoritⁱ/skazat^p* [say^{i/p}] 'say^{i/p}'. One cluster has the Activity + Natural Perfective + Specialized Perfective + Complex Act + Single Act structure: *xv^aatⁱ/xv^ait^p* [grab^{i/p}] 'grab^{i/p}'. In these clusters, the Complex Act and Single Act verbs are all built from the Imperfective stem; in other words, all NON-COMPLETABLE verbs are built from the Imperfective stem. The Natural Perfective is always represented by the Perfective stem. Specialized Perfectives are built from both the Imperfective and the Perfective stem. This distribution confirms the positions of the Natural Perfective and Specialized Perfective in the implicational hierarchy, constituting a special branch of the hierarchy devoted to verbs that describe COMPLETABLE situations.

5. Brief excursus on problematic types

The two types of verbs that were excluded from the initial survey will be examined here: the biaspectual verbs and the motion verbs (cf. Section 3.1). The biaspectual verbs lack some of the morphological distinctions that most verbs have, resulting in some syncretism within their clusters, but the structures of their clusters conform to the implicational hierarchy given above. The motion verbs make a unique aspectual distinction, however that distinction is well-motivated by the parameters of the conceptual space of aspect. Like the biaspectual verbs, the motion verbs have clusters that conform to the implicational hierarchy. Furthermore, the integration of data from these two types of verbs would not significantly change the patterns outlined in Table 1.

5.1 Biaspectuals

Simply stated, biaspectual verbs are verbs that lack distinct forms for Perfective vs. Imperfective. Biaspectual verbs are similar in some ways to words with syncretic paradigms; much like English *deer*, which is singular or plural depending on context (*that deer* vs. *those deer*), the aspect of a word like *specializirovat^{p/i}* [specialize^{p/i}] ‘specialize^{p/i}’ is disambiguated in context (as asserted by Čertkova 1996: 100–109, Galton 1976: 294, Zaliznjak & Šmelev 2000: 10). In actual practice, however, biaspectual verbs often have some morphology to distinguish between Perfective and Imperfective in at least parts of their paradigms. For the purpose of the survey, I initially eliminated eleven biaspectual verbs from Townsend’s (1975) inventory, but I will analyze them here. These biaspectual verbs produce only two cluster types: two biaspectual verbs have the cluster type Activity + Natural Perfective + Specialized Perfective, which is the most frequent cluster type in the survey; the remaining nine biaspectual verbs have the cluster type Activity + Natural Perfective, which is a well-attested but uncommon cluster type. Here are the data:

Activity + Natural Perfective + Specialized Perfective. The two biaspectual verbs that conform to this cluster type are *rekomentovat^{p/i}* [recommend^{p/i}] ‘recommend^{p/i}’ and *rodit^{p/i}* [givebirth^{p/i}] ‘give birth^{p/i}’. Both of these verbs use some extra morphology, resulting in a redundancy of forms to express Activity and/or Natural Perfective. *Rekomentovatⁱ* [recommendⁱ] ‘recommend^p’ serves to express Activity, and the homonym *rekomentovat^p* [recommend^p] ‘recommend^p’, along with *porekomentovat^p* [along-recommendⁱ] ‘recommend^p’ and *otrekomentovat^p* [off-recommendⁱ] ‘recommend^p’ all express the Natural Perfective. A Specialized Perfective is expressed by *zarekomentovat^p* (*себя*) [fix-recommendⁱ (self)] ‘prove^p oneself’. Three forms, *roditⁱ* [givebirthⁱ], *rožatⁱ* [givebirthⁱ], and *roždatⁱ* [givebirthⁱ] ‘give birth^p’, all express Activity. The Natural Perfective is expressed primarily by *rodit^p* [givebirth^p] ‘give birth^p’, though the prefixed [along-givebirthⁱ] *porodit^p* can be used in this way. However, *porodit^p* [along-givebirthⁱ] usually expresses a Specialized Perfective with the meaning ‘generate^p’, and other Specialized Perfectives are represented by *pererodit^p* [re-givebirthⁱ] ‘regenerate^p’, *vozrodit^p* [up-givebirthⁱ] ‘revive^p’ and *urodit^p* [down-givebirthⁱ] ‘bear^p, bring forth^p’.

Activity + Natural Perfective. The nine verbs from our survey that have this cluster type are: *klassificirovat^{p/i}* [classify^{p/i}] ‘classify^{p/i}’ (but note the alternative Natural Perfective *rasklassificirovat^p* [apart-classifyⁱ]), *annulirovat^{p/i}* [annul^{p/i}] ‘annul^{p/i}’, *diskvalificirovat^{p/i}* [disqualify^{p/i}] ‘disqualify^{p/i}’, *likvidirovat^{p/i}* [liquidate^{p/i}] ‘liquidate^{p/i}’, *modernizirovat^{p/i}* [modernize^{p/i}] ‘modernize^{p/i}’,

populjarizirovat^{p/i} [popularize^{p/i}] ‘popularize^{p/i}’, *specializirovat*^{p/i} [specialize^{p/i}] ‘specialize^{p/i}’, *utrirovat*^{p/i} [exaggerate^{p/i}] ‘exaggerate^{p/i}’, *velet*^{p/i} [order^{p/i}] ‘order^{p/i}’ (but note alternative Natural Perfective form of *povelet*^p [along-orderⁱ] ‘order^p’). For all of these clusters, there are two homonymous forms that express Activity and Natural Perfective.

A sample study performed on a more comprehensive list of biaspectual verbs (from Anderson 2002) revealed that the pattern observed here is representative of the class as a whole. Most biaspectual verbs have the Activity + Natural Perfective cluster type, a smaller portion of them have the Activity + Natural Perfective + Specialized Perfective cluster type, and other types were not found and can be assumed to be non-existent or rare.

5.2 Motion verbs

Russian motion verbs are notorious for their peculiar aspectual behavior, particularly because unprefixated Imperfective motion verbs express a distinction between Determined motion (motion in a single direction, toward a goal) and Non-determined motion (motion not in a single direction, and therefore in random directions, repeated round-trips, or where direction is irrelevant). Rakhilina (2004: 7) characterizes the Determined motion verb *idti*^{i-det} [walk^{i-det}] ‘walkⁱ’ as “always non-arbitrary” and “hence goal-oriented”. I will suggest that the parameters that motivate this distinction are already present in the conceptual space of aspect proposed in Figure 2, and particularly in the COMPLETABLE VS. NON-COMPLETABLE distinction. For Activities, the COMPLETABLE VS. NON-COMPLETABLE distinction is not realized as a formal distinction in Russian verbs, with the one exception of the motion verbs, which do have formally distinct Determined and Non-determined verbs that correspond to the COMPLETABLE VS. NON-COMPLETABLE distinction. The Determined motion verbs express inherently COMPLETABLE situations (because they express a direction), and their clusters contain Natural Perfectives and Specialized Perfectives, but exclude Complex Acts and Single Acts. The Non-determined motion verbs express inherently NON-COMPLETABLE situations, and their clusters lack Natural Perfectives and Specialized Perfectives, but include Complex Acts and Single Acts. When prefixes are added the Determined vs. Non-determined distinction is abandoned (i.e., prefixed motion verbs are not classified as Determined vs. Non-determined), but the COMPLETABLE VS. NON-COMPLETABLE distinction continues to be relevant: Perfectives formed from Determined stems are COMPLETABLE, whereas Perfectives formed from Non-Determined stems are NON-COMPLETABLE. The prefixed forms derived from Determined motion

verbs express Completion Acts, and are either Natural Perfectives or Specialized Perfectives. Perfectivization of the NON-COMPLETABLE Non-determined motion verbs results in verbs that express Complex Acts and Single Acts. Thus there is a complementary distribution among the Perfectives formed from motion verbs corresponding to the COMPLETABLE vs. NON-COMPLETABLE distinction. Additionally, prefixes can be added to the Non-determined motion verbs to create Imperfective Activities that correspond to the Specialized Perfectives. Thus, for example, the Determined motion verb *idti*^{i-det} [walk^{i-det}] expresses ‘walkⁱ’ as a COMPLETABLE motion toward a goal, whereas the Non-determined motion verb *xodit*^{i-nondet} [walk^{i-nondet}] expresses ‘walkⁱ’ as a NON-COMPLETABLE random motion or repetition of round-trips. The Natural Perfective *pojti*^P [along-walk^{i-det}] ‘walk^P’ is formed by adding a prefix to the Determined stem, as are Specialized Perfectives like *vojt*^P [in-walk^{i-det}] ‘walk^P in’ and *vyjt*^P [out-walk^{i-det}] ‘walk^P out’. Parallel prefixed forms derived from the Non-determined stem express the corresponding Activities *vxodit*ⁱ [in-walk^{i-nondet}] ‘walkⁱ in’ and *vyxodit*ⁱ [out-walk^{i-nondet}] ‘walkⁱ out’. The cluster of the Non-determined stem will contain Perfective verbs of the NON-COMPLETABLE types: a Complex Act, like *poxodit*^P [awhile-walk^{i-nondet}] ‘walk^P (for a while)’, as well as a Single Act, such as *sxodit*^P [roundtrip-walk^{i-nondet}] ‘walk^P (on one round trip)’ (a singularization of the repeated cycles of *xodit*^{i-nondet} [walk^{i-nondet}] ‘walkⁱ’, just as *ščipnut*^P [pinch/pluckⁱ-once] ‘pinch, pluck^P (once)’ is a singularization of the repeated cycles of *ščipat*ⁱ [pinch/pluckⁱ] ‘pinch, pluckⁱ’). For any given manner of motion (walking, running, flying) there are two clusters that interact in this way.

The survey of cluster types originally excluded all the motion verbs in Townsend’s (1975) Verb Inventory, namely twelve Determined motion verbs *brestit*^{i-det} [trudge^{i-det}] ‘walkⁱ with difficulty’, *bežat*^{i-det} [run^{i-det}] ‘runⁱ’, *vezti*^{i-det} [convey^{i-det}] ‘carryⁱ (by vehicle)’, *vesti*^{i-det} [lead^{i-det}] ‘leadⁱ’, *gnat*^{i-det} [drive^{i-det}] ‘driveⁱ, chaseⁱ’, *exat*^{i-det} [ride^{i-det}] ‘rideⁱ’, *idti*^{i-det} [walk^{i-det}] ‘walkⁱ’, *lezt*^{i-det} [climb^{i-det}] ‘climbⁱ’, *letet*^{i-det} [fly^{i-det}] ‘flyⁱ’, *nesti*^{i-det} [carry^{i-det}] ‘carryⁱ (on foot)’, *plyt*^{i-det} [swim/sail^{i-det}] ‘swimⁱ, sailⁱ’, *polzti*^{i-det} [crawl^{i-det}] ‘crawlⁱ’, and eight Non-determined motion verbs *brodit*^{i-nondet} [trudge^{i-nondet}] ‘walkⁱ with difficulty’, *vozt*^{i-nondet} [convey^{i-nondet}] ‘carryⁱ (by vehicle)’, *vodit*^{i-nondet} [lead^{i-nondet}] ‘leadⁱ’, *lazit*^{i-nondet}/*lazar*^{i-nondet} [climb^{i-nondet}] ‘climbⁱ’, *letat*ⁱ [fly^{i-nondet}] ‘flyⁱ’, *nosit*^{i-nondet} [carry^{i-nondet}] ‘carryⁱ (on foot)’, *plavat*^{i-nondet} [swim/sail^{i-nondet}] ‘swimⁱ, sailⁱ’, *polzat*^{i-nondet} [crawl^{i-nondet}] ‘crawlⁱ’.¹⁷

The Non-determined stems are particularly productive in the formation of verbs expressing Complex Acts. For example, *letat*ⁱ [fly^{i-nondet}] ‘flyⁱ’ forms many Complex Acts including: *zaletat*^P [begin-fly^{i-nondet}] ‘begin to (be able to) fly^P’, *naletat*^P [amount-fly^{i-nondet}] ‘fly^P a given distance’, *poletat*^P [awhile-

fly^{i-nondet}] ‘fly^p (for a while)’, *otletat^p* [end-fly^{i-nondet}] ‘stop flying^p, stop being a pilot^p’. In addition, some of the Non-determined stems have secondary idiomatic meanings for which there are Specialized Perfectives. For example, *nosit^{i-nondet}* [carry^{i-nondet}] ‘carryⁱ (on foot)’ can also mean ‘wearⁱ’, engendering Specialized Perfectives *zanosit^p* [excess-carry^{i-nondet}] ‘soil by wearing too long^p’, *obnosit^p* [around-carry^{i-nondet}] ‘wear out^p (clothing)’, *raznosit^p* [apart-carry^{i-nondet}] ‘break in^p (shoes)’, and *iznosit^p* [from-carry^{i-nondet}] ‘wear out^p (clothing)’. The Non-determined stem can also refer to bearing a child through pregnancy, which yields *vynosit^p* [out-carry^{i-nondet}] ‘bring forth a child^p’. Given this fact, we may want to class some of the Non-determined motion verbs (or at least some of their meanings) in the Activity + Specialized Perfective + Complex Act + Single Act cluster type, which is somewhat more common.

Motion verbs show a collaboration between a verb cluster of a common type, Activity + Natural Perfective + Specialized Perfective (based on a Determined stem), and a verb cluster of the well-attested type Activity + Complex Act + Single Act (based on a Non-Determined stem). Because the two verb clusters show a complementary distribution of types of Perfectives, together they instantiate the maximal cluster type containing all five elements: Activity + Natural Perfective + Specialized Perfective + Complex Act + Single Act. In other words, the Determined and Non-Determined stems for any given manner of motion team up to create a cluster that is suppletive in a sense similar to that of many other aspectual clusters found in Russian, as identified in the list of citations in 3.3.

The present model not only accommodates the motion verbs, which are notorious for their aspectual complexity, but fully integrates their behavior into that of aspect as a whole in Russian. The motion verbs can be explained using the very same dimensions of the conceptual space of aspect developed in Section 2. The motion verbs realize the COMPLETABLE VS. NON-COMPLETABLE distinction within the OPEN region of the conceptual space. Although the motion verbs are the only Russian verbs that take advantage of this combination of distinctions, their interaction is supported by the model. This model makes it possible to understand the Determined vs. Non-determined distinction as a realization of the existing parameters that govern Russian aspect as a whole. And the structure of verb clusters based on motion verb simplexes conforms to the patterns of verb clusters in the rest of the verbal lexicon.

5.3 Conclusions on problematic types

The biaspectual verbs and the motion verbs present some unusual combinations of form and meaning, with a lack of distinctiveness in form for the

biaspectual verbs and an added aspectual distinction for the motion verbs. However, the overall behavior of both groups of verbs is fully consistent with the proposed model of conceptual space. Both groups of verbs present cluster types that are very common or at least very well-represented in the rest of the lexicon. Furthermore, the aspectual behavior of the motion verbs is fully integrated into the model, requiring merely a fuller realization of the potential interaction between the *COMPLETABLE VS. NON-COMPLETABLE* and *OPEN VS. CLOSED* distinctions.

6. Conclusions

This article provides a model of aspectual clusters of Russian verbs that can replace the traditional model of the aspectual “pair”. The model is predicated upon a semantic map that conflates aspectual and actional parameters and thus motivates the distinction of four different types of Perfectives in addition to Imperfective Activities. The semantic map makes it possible to show how aspect and actionality distinctions interact. Given the map and the distinctions it provides, one is in turn able to identify all the types of aspectual/actional relationships that can exist among verbs and to predict what structures of aspectual clusters are theoretically possible. The map highlights the central role of Activities as well as the fact that the various Perfectives are related to each other via corresponding Activities. A multiply-stratified sample of the population of Russian verbs attests to the existence of only a subset of the theoretically possible aspectual cluster types, and all attested clusters conform to a single implicational hierarchy. It can be shown that all examples with atypical relations between morphological form and aspect (suppletive, dual simplex, biaspectual, and motion verbs) likewise conform to the hierarchy.

In addition to facilitating the distinctions that make analysis of aspectual clusters possible, the proposed semantic map provides several crucial insights into the Russian verb system. The map accommodates the interaction of the *OPEN* parameter with the *COMPLETABLE VS. NON-COMPLETABLE* distinction in the differentiation of Determined vs. Non-determined motion verbs. The map likewise reveals that the verb clusters of the Determined and Non-determined stems collaborate to constitute a larger cluster incorporating all the aspectual/actional distinctions available among Russian verbs. Finally, the semantic map exposes the central role of Activities in aspectual clusters: the *OPEN* Activities serve as a sort of Grand Central Station in the structuring of clusters because the various Perfectives are formed not from each other, but from related

Activities (cf. Figure 5). In the web of aspectual relationships, each Perfective is tied back to a corresponding Activity. This latter fact is one that is inherent in the map, but not in the hierarchy.

The semantic map proposed for Russian aspect contributes to our understanding of the practical problems posed by Russian verbs, and it probes some issues relevant to the larger theoretical issues concerning conceptual space and semantic maps. The model presented here is an improvement over the traditional model of aspectual “pairs” because it accounts for the real complexity attested in the Russian verb system. This model also provides more information about how the Perfective and Imperfective verbs are related to each other, embodied in the highly constrained set of connections and implicational hierarchy. Given the strong preferences for this well-defined set of combinations of various Perfective and Imperfective verbs, it would make sense for both linguists and pedagogs to class verbs according to their cluster types, rather than merely seeking to identify “pairs”.

The arrangement of the conceptual space makes some specific predictions about Russian aspect. What remains to be determined is whether this model can be applied cross-linguistically. The typologically unusual characteristics of Slavic aspect may make certain comparisons impossible, however it should be possible to investigate the cross-linguistic importance of the parameters of the conceptual space suggested here.

Notes

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1. I am not the first to raise doubts about the validity of the “pair” model. Isačenko (1960: 159) raised the objection that the methods of aspectual analysis created “the entirely false impression that ‘pairedness’ (‘aspectual correspondence’) was the ‘norm’ for the Slavic verb”. Bertinetto & Delfitto (2000: 210), in describing the “bipolar” (Perfective vs. Imperfective) contrasts of Russian verbs, state that “although some pairs lack one of the two poles,...in quite a few cases one (or both) of the two poles comprises more than a single member”. Tatevosov (2002: 369–70) cites the fact that a given Imperfective Russian verb often has multiple “pairings”.

2. Both Dahl (1985: 71–72) and Smith (1991: 277) point out this typological correlation concerning the markedness values of Perfective and Imperfective. Markedness here refers to an asymmetrical functional relationship in the sense described by Battistella (1996), Comrie (1983) and Janda (1995).

3. Bertinetto & Delfitto (2000: 189) assert that the Perfective vs. Imperfective distinction in Slavic “belongs to the domain of actionality rather than aspect proper”, yet that this distinction interacts with other actional distinctions in Slavic. I have opted to maintain a more traditional differentiation between what are normally termed “aspect” and “Aktionsart” in Russian. Either way, the point is that the dimensions interact, whether or not we can be certain of where to draw the line between aspect and actionality.

4. Here are examples illustrating that gnomic States can be described using both Imperfective and Perfective verbs: *Ryby dyšatⁱ žabrami*. ‘Fish breatheⁱ with gills.’ *Vot primer iz škol'nogo učebnika matematiki, kotoryj rešit^p ljuvoj vos'miklassnik*. ‘Here is an example from a math textbook which any eighth-grader can solve^p [literally: any eighth-grader solves^p].’

5. Here and elsewhere in the article, motion verbs will be tagged with superscript “det” to indicate Determined and superscript “nondet” to indicate Non-determined. It is of course possible to identify a destination with a Non-determined motion verb, as in *xodit^{i-nondet} v školu* [walk^{i-nondet}] ‘walkⁱ to school’, but this construction can also be translated as ‘attend school’, because it describes a habit of repeated trips, not something that can be completed. In other words, arrival at school does not bring *xodit^{i-nondet} v školu* [walk^{i-nondet}] ‘walkⁱ to school’ to an end, it is just part of the repeated cycles of the habit of attending school. For more on motion verbs, see Section 5.2.

6. This verb looks like a derived Perfective verb because it contains the common Perfectivizing prefix *u-* plus the same root that appears in the adjective *mertvyj* ‘dead’, but there exists no simplex base verb **meretⁱ*.

7. The total number of base verbs in the survey is 285, and this number exceeds the number of clusters because there are two instances where two verbs of a single cluster were in the survey. These are *vzjat^p* [take^p] ‘take^p’, *bratⁱ* [takeⁱ] ‘takeⁱ’ and *kinut^p* [throw^p] ‘throw^p’, *kidatⁱ* [throwⁱ] ‘throwⁱ’.

8. The productive perfectivizing prefixes (including orthographic variants) are: *v(o)-*, *vz(o)-/vs-*, *vy-*, *do-*, *za-*, *iz(o)-/is-*, *na-*, *nad(o)-*, *o(b/bo)-*, *ot(o)-*, *pere-*, *po-*, *pod(o)-*, *pri-*, *pro-*, *raz(o)-/ras-*, *s(o)-*, *u-*. The semantic contributions of the prefixes to the verbs they perfectivize are the subject of a vast literature, and lie beyond the scope of this article.

9. The complexities of motion verbs will be dealt with in more detail in Section 5.2. There are, of course, prefixes that do produce Perfectives from Non-determined simplexes, such as *po-* [awhile-] which yields the Complex Act *poxodit^p* [awhile-walk^{i-nondet}] ‘walk^p (for a while)’ and *s-* [roundtrip-] which gives us the Single Act *sxodit^p* [roundtrip-walk^{i-nondet}] ‘make one round trip^p’ (but note the homonymous *sxoditⁱ* [down-walk^{i-nondet}] ‘descend^p’).

10. There are three Imperfectivizing suffixes (three morphemes) in Russian, however two of them have graphemic variants, *-aj/-jaj* and *-yvaj/-ivaj*, due to the spelling rules of Russian orthography. The *-vaj* suffix is the only one no longer used to productively derive

Imperfectives from new verbs entering the lexicon, but it is the standard suffix used with several classes of existing verbs.

11. Russian has two *-nu* morphemes, a “non-disappearing” *-nu* suffix and a “disappearing” *-nu* suffix (the labels refer to the behavior of the suffix in inflection). It is the “non-disappearing” suffix that is relevant here, because only the “non-disappearing” *-nu* is used in deriving aspectually related verbs. There are four exceptional Imperfective “non-disappearing” *-nu* verbs in Contemporary Standard Russian, but they are irrelevant to this study because they are not examples of aspectual suffixation.

12. There are some apparent counterexamples to this claim, among them the oft-cited cluster *čitatⁱ* [readⁱ] ‘readⁱ’, *pročitat^p* [through-read^p] ‘read^p (through)’, *pročityvatⁱ* [through-readⁱ-Impf] ‘readⁱ (through)’ in which it appears that an Imperfective has been derived from a Natural Perfective. This is a rather unusual example, and I will side with Mehlig (1997, 2003) who affirms that Imperfectives are derived from Specialized Perfectives and that verbs are often polysemous. In other words, I will claim that *pročitat^p* [through-read^p] ‘read^p (through)’ has two meanings, one which is the Natural Perfective of *čitatⁱ* [readⁱ] ‘readⁱ’ and means merely ‘read^p’, and another which means ‘read through^p’, and that *pročityvatⁱ* [through-readⁱ-Impf] ‘read throughⁱ’ is derived from the latter, not the former.

13. For more on dual simplex verb associations, see Feldstein 2005. Not all scholars will agree with Feldstein that these groups of verbs are really dual simplexes rather than being related by derivational morphology. However, the point is that the cluster model can accommodate these verbs regardless of whether the relationship is considered to be dual simplexes or aspectual derivation.

14. Zaliznjak 1980 is a reverse dictionary, which facilitates the search for verbs with the same stem but different prefixes. Because it does not provide meanings or much other information, it contains many more verbs than ordinary dictionaries do, and thus is a better source for locating Specialized Perfectives.

15. Hyug Ahn and I performed diligent searches for authentic data to support the designation of Complex Acts, using the standards set by the Linguists for Responsible Use of the Internet website, <http://www.unc.edu/~lajanda/responsible.html>.

16. The remaining thirteen verbs are: *vosprjanut^p* [cheer up^p] ‘cheer up, take heart’, *vstrepenut^{’sja}^p* [rouse^p-self] ‘rouse^p oneself’, *grjanut^p* [burst^p] ‘burst, crash out^p’, *naskučit^p* [bore^p] ‘bore^p’, *opomnit^{’sja}^p* [come to senses^p-self] ‘come to one’s senses^p’, *očnut^{’sja}^p* [regain consciousness^p-self] ‘regain consciousness^p’, *očutit^{’sja}^p* [find^p-self] ‘find oneself at a location^p’, *poskol’znut^{’sja}^p* [slip^p-self] ‘slip^p’, *ruxnut^p* [collapse^p] ‘collapse^p’, *skončat^{’sja}^p* [end^p-self] ‘die^p’, *sostojat^{’sja}^p* [happen^p-self] ‘happen^p’, *uliznut^p* [slip away^p] ‘slip away^p’, *xlynut^p* [gush^p] ‘gush^p’.

17. There is some imbalance in representation here due to the fact that the determined motion verbs tend to belong to unproductive or irregular verb types (all of which are fully represented in the Verb Inventory), whereas the non-determined verbs belong to productive types (for which the Verb Inventory gives only representative samples).

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