

Perfective Prefixes: What They Are, What Flavors They Come in, and How They Are Acquired

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In this paper, I will address the following questions: Do perfective prefixes express lexical or grammatical aspect? Are they a homogeneous group, and if not, what types are there? How can they be analyzed in terms of phrase structure? I will also very briefly review recent work on how are they represented in the mental lexicon of native speakers, how they are acquired by children learning their first language and adults learning a second language, and what they mark in attrited grammars.

1. Lexical vs. grammatical aspect

The term *aspect* refers to the internal temporal structure of events as described by verbs, verbal phrases (VP) and sentences (Comrie 1976, Smith 1991). It is the property that makes it possible for a sentence to denote a completed (terminated) or an incomplete (ongoing) event. Two types of aspectual marking have been identified in natural language. The first type, lexical aspect, also known as situation aspect (Smith 1991), VP aspect or *Aktionsart* refers to a semantic property of predicates which depends on the meaning of the verb and properties of its internal argument and adjuncts. That is, an event can have an inherent limit or endpoint, or it has the potential of continuing indefinitely. By definition, an event with an inherent endpoint is called telic (from Greek *telos* “limit, end, goal”) and an event without inherent endpoint is called atelic. Together with other semantic features, telicity is responsible for dividing all predicates into the four Vendler (1967) classes: accomplishments (*run a mile, run the marathon, drink up*), achievements (*die, realize, find*), activities (*run, run laps*) and states (*know, believe*). Lexical aspect can be expressed by a variety of means: it can be lexicalized in some verbs, but also encoded by derivational morphology, or by inflectional markers on the direct object:

- (1) telic predicates: *eat a piece of cake, drink two beers, find a wallet, realize, sex up a dossier (on WMD in Iraq)*

atelic predicates: *eat cake, drink beer, think about you, know, believe*

Grammatical aspect (also called IP aspect, sentential aspect, or viewpoint aspect) is indicated by perfective and imperfective morphemes. These morphemes reflect “different ways of viewing the internal temporal constituency of a situation” (Comrie 1976:3). The perfective looks at the situation from outside and disregards the internal structure of the situation. The imperfective, on the other hand, looks at the situation from inside and is concerned with the internal structure without specifying the beginning or end of the situation. Thus, by definition the imperfective viewpoint subsumes the habitual and the ongoing viewpoints, since both these meanings are unbounded. Grammatical aspect is best exemplified by the aorist, perfect, and imperfect aspectual tenses, as in Romance languages, English, Bulgarian. It applies to clauses and is most often expressed by inflectional morphology combining tense and aspectual information. Note that both events in (2) are telic, but they differ in grammatical aspect.

- (2) perfective: *I ate a piece of cake last night.*
imperfective: *I was eating a piece of cake when she called.*

Lexical and grammatical aspect are orthogonal aspectual categories, but they interact in interesting ways. Dowty's (1979) Imperfective Paradox shows the effect of the progressive on telic events: the progressive form seemingly "takes away" the built-in endpoint in accomplishment sentences as in (2) above. Such sentences clearly demonstrate the need for two aspectual distinctions: one based on potential endpoints (telicity) and the other based on actual endpoints, which is labeled boundedness (Depraetere 1995, following Declerck 1989). A situation is bounded in time if it has reached a temporal boundary, irrespective of whether the situation has an inherent endpoint or not.

2. Slavic perfective prefixes (preverbs)

Slavic verbal forms exist in simple and derived forms, where the simple form most often denotes an atelic event or state (e.g., *jest' tort* 'eat cake', *ljubit'* 'love') while the perfective form normally denotes telic events (e.g., *s-jest tort* 'eat the cake', *po-ljubit'* 'fall in love') (Brecht,

1984; Paducheva, 1990, a.o.). There are about 19-21 perfective prefixes in Russian (19 in Bulgarian), each combining idiosyncratic lexical meaning(s) with the basic telicity meaning (exemplified in (3b)). Each verb selects for a number of prefixes, with subsequent changes in lexical meaning (cf. 3c,d,e).

- (3) a. pisat' 'write'
b. na-pisat' 'write up'
c. pod-pisat' 'sign'
d. do-pisat' 'write to the end (something that was started)'
e. pere-pisat' 're-write'
f. po-pisat' 'write for a while'

In the above examples, the form in (3a) is the simplex, imperfective form. The addition of the prefix *na-* adds an inherent endpoint to the event of writing and makes the verb perfective. In this example, we can classify *na-* as a purely telic marker, without any additional idiosyncratic meaning, because all it adds to the verbal meaning is a potential endpoint. In (3c,d,e), however, we have prefixes *pod-*, *do-*, and *pere-*, which add lexical meanings of their own to the verbal root meaning, over and above signaling telicity. *Pod-* changes the verbal meaning from *write* to *sign*, while *do-* adds the meaning of finishing off something that had been begun but interrupted. *Pere-* is akin in function to the English prefix *re-*, as in *re-do*, *re-read*. In this sense, we can view perfective prefixes as derivational, not inflectional morphemes. As derivational affixes, all carry some grammatical (categorical) meaning, but not all carry additional lexical meaning.¹

¹ An important caveat is in order. Since all Slavic prefixes are polysemantic, we can only speak of particular 'senses' or 'uses' of each prefix. For example, *na-* has a sense in which it is purely telic (i) and at least three more senses in which it has a telic meaning plus a lexical meaning (ii, iii, iv).

- (i) na-pisat' 'write up'
(ii) na-gotovit' 'cook something in big quantities'
(iii) na-boltat'sja 'chat with someone to one's heart's content'
(iv) na-brosit' 'throw on top of something'

Thus, throughout this paper when I write 'purely telic prefix' I actually mean 'a purely telic sense of a prefix'.

3. Approaches to perfective prefixes

The literature on Slavic aspect is divided on the issue of whether Slavic perfective prefixes fall in the domain of grammatical (viewpoint) or lexical (situation) aspect. Most researchers (Comrie, 1976, among others) agree that Slavic aspectual prefixes mark specific ways of presenting the situation as a process, a telic event, or a state. But it is also true that the vast majority of research on Slavic aspect does not necessarily refer to the two levels of aspect marking. Thus we can only conjecture on how most researchers would solve the viewpoint versus situation aspect issue. Among the ones who do have a clear position, we will distinguish the following positions.

3.1. Perfective prefixes reflect grammatical aspect distinctions. This position can be found in the work of Smith (1991) (cf. Chapter 10 written with Rappaport), Borik (2002). One argument these researchers advance is that perfective prefixes make visible the initial and/or final endpoints of the event (Smith 1991: 231). Another argument is that not all imperfective verbs are interpreted as atelic (cf. (4) from Borik (2002):

- (4) Ja ne pojdú v kafe, ja (uže) jela.
I not PERF-go-PRES in café, I (already) IMP-eat-PAST
'I am not going to the café, I have already eaten.'

Neither is it the case that all perfective verbs are telic. For example, the perfective prefixes *po-* and *pro-* delimit the interval during which the event was in progress, but do not mark a culmination in that event. Again, example from Borik (2002):

- (5) Petja po-iskal knigu.
Petja PERF-search-PAST book
'Petja looked for a/the book.'

3.2. Perfective prefixes are neither grammatical nor lexical aspect markers. This is the approach adopted in traditional grammars of Slavic and more recently by Filip 2001, 2004, a basically lexical-semantics approach as the following quotation suggests: "A prefixed verb in Slavic languages is best seen as a new verb that stands in a derivational relation to its base, rather than being an aspectually different form of the same lexeme." (Filip 2004). For Filip, prefixes are not inflectional morphemes,

as markers of both lexical and grammatical aspect are across languages of the world. They can recur on the same stem, as we can see in the Bulgarian *pisa – na-pisa – po-na-pisa* ‘wrote – wrote up – wrote up a significant part of X’. According to Filip, a prefix’s presence on a verb is neither a sufficient nor a necessary formal indicator of the perfective status of a verb. Finally, she submits that there is no single prefix dedicated to the expression of perfective meaning (telicity) and which has no other idiosyncratic lexical sense.

All of the arguments for the two positions reviewed above are based on undeniable facts. But they strike me as arguments of the following type: “There are some exceptions, hence, the rule does not exist”! These positions, to my mind, “throw the baby out with the bath water.” That is why, following Brecht 1984, Filip 1993, Piñon 1995, Verkuyl 1999, I would like to argue that

3.3. *Perfective prefixes reflect lexical aspect distinctions.* Here I will present an argument for this position from typology: Bulgarian uses both perfective prefixes and aspectual tenses to signal aspect. There is a clear parallel between telicity and perfective prefixes, the aorist/imperfect tenses and boundedness in Bulgarian (and Ancient Slavonic, see Bertinetto 2001).

- (6) (PREFIX + AORIST = *telic, bounded*)
 Ivan pro-čete Vulšebnata planina ot Tomas Man.
 Ivan PV-read-AOR/3sg the magic mountain by Thomas Mann
 'Ivan read 'The Magic Mountain' by Thomas Mann.'
- (7) (NO PREFIX + AORIST = *atelic, bounded*)
 Ivan čete Vulšebnata planina ot Tomas Man.
 Ivan read- AOR/3sg the magic mountain by Thomas Mann
 'Ivan read from 'The Magic Mountain' by Thomas Mann.'
- (8) (PREFIX + IMPERFECT = *telic, unbounded*)
 Ivan pro-čita-še Vulšebnata planina vsyaka godina.
 Ivan PV-read-IMP/3sg the magic mountain every year
 'Ivan read 'The Magic Mountain' completely every year.'
- (9) (NO PREFIX + IMPERFECT = *atelic, unbounded*)
 Ivan čete-še Vulšebnata planina kogato go vidyax.
 Ivan read-IMP/3sg the magic mountain when him (I) saw
 'Ivan was reading 'The Magic Mountain' when I saw him.'

If Slavic prefixes were markers of grammatical and not lexical aspect, then Bulgarian would have two separate grammatical aspect markers. To have the same (or similar) features of two different overt sets of morphemes checked in the same functional category, say, GrAspP, would be a highly marked choice across languages of the world. It is much more logical to treat prefixes as lexical aspect, aspectual tenses as (im)perfective aspect, and then Bulgarian would pattern with Romance and English aspect marking. Furthermore, the Bulgarian telicity and boundedness markers cannot conceivably be checked in the same functional category, as there is a complex interaction between the two. In (8), the presence of the telicity morpheme constrains the interpretation of the unboundedness morpheme to habitual/iterative action only, but the ongoing interpretation as in (9) is crucially lacking. The higher morpheme cannot undo the entailment of the lower morpheme, which suggests hierarchical structure. But at the same time, Bulgarian prefixes are historically related to prefixes in the other Slavic languages. To sum up this argument, it is unlikely that prefixes are lexical aspect markers in some Slavic languages but grammatical aspect markers in others.

3.4. Russian perfective prefixes as a syncretism of both lexical and grammatical aspect. Finally, before going on to describe the types of prefixes, there is a fourth point of view, that of Bertinetto (2001). This author argues that due to the extreme poverty of the inflectional system, the lexical opposition in Slavic languages without overt grammatical aspect had to take on grammatical aspect meanings, giving rise to a “syncretic system” where lexical and grammatical aspect are intertwined. (p. 206) Unfortunately, Bertinetto does not develop his proposal in much more detail, and it is unclear how to evaluate it compared to other, better articulated approaches.

4. There is System to this Madness: Types of perfective prefixes

As we saw above, perfectivity cannot be strictly equated with telicity. There are prefix-less roots that happen to be telic. There are also prefixes that are not real telicity markers. However, as I argued above, to maintain that therefore perfective prefixes are not telicity markers would be to miss an important generalization. Careful examination of prefixes reveals that they are not a homogeneous group (Babko-Malaya, 1999; Di Sciullo and Slabakova, 2005; Filip, 2001), but can be divided into at least

two groups: *internal* and *external* ones. Internal prefixes may change the telicity of the verbal projection they are part of, whereas external prefixes do not have this effect. The external/internal prefix hypothesis accounts for the linear order properties of prefixes, see (10). This configurational asymmetry makes a number of predictions for Slavic, which we will examine with Bulgarian examples. The arguments should hold, *mutatis mutandis*, for the rest of the Slavic languages.

(10) [_v External prefixes [_v Internal prefixes V]]

In Bulgarian, the prefixes *pre-* ('repeated action') and *po-* ('briefly') have adverbial properties in (11b) and (12b) in the sense that they provide adverbial-like modification to the eventuality denoted by the root. On the other hand, the prefix *na-* 'on' has prepositional properties.

- | | |
|---------------------------|--------------------------------|
| (11) a. bojadisam 'paint' | b. pre-bojadisam 're-paint' |
| (12) a. četa 'read' | b. po-četa 'read for a while' |
| (13) a. piša 'write' | b. na-piša 'write out in full' |

I analyze *pre-* and *po-* as external prefixes and *na-* as an internal one. Crucially, I will show that whenever the prefix has an effect on the verb's argument structure and/or lexical semantics, it must be an internal prefix. The configurational difference between prefixes accounts for the linear order properties of prefixes in Bulgarian, as illustrated below. First, external prefixes must precede internal prefixes:

- (14) a. pro-četa 'read in full'
 b. pre-pro-četa 'read in full once again'
 c. *pro-pre-četa 'read in full once again'

Second, in denominal and deadjectival verbs, an internal prefix must come closer to the root than an external one:

- | | |
|----------------------------------|--------|
| (15) a. červja 'make red' | ATELIC |
| b. na-červja 'redden' | TELIC |
| c. *pre-červja 'redden again' | TELIC |
| d. pre-na-červja 'redden again' | TELIC |
| e. *na-pre-červja 'redden again' | TELIC |

Third, external prefixes may be iterated and co-occur, while internal prefixes, as they are in the argument-structure domain of a verbal projection cannot be iterated and cannot co-occur:

- (16) a. pre-pre-iz-bra 're-re-elect'
 b. *iz-iz-bra 'elect'
 c. pre-pre-čerta 're-re-draw'
 d. *na-na-čerta 'finish drawing'

Fourth, when more than one prefix occurs on a given stem, it is only one of them that supplies the event endpoint; the others offer additional meanings similar to adverbial manner modification. Take the examples in (17). The prefix *s-* in (17c) supplies the end point, the prefix *po-* in (17b,d) offers an attenuative meaning of doing something for a little while or to a small degree, and the prefix *iz-* encodes distributivity of the event over a lot of participants. Both *karax se* and *po-karax se* in (17a,b) are grammatical with a durational adverbial like *for an hour*, while the telic verbs in (17c-e) are not. Note also that the adverbial-like prefix *po-* means 'for a while' when attached to the atelic root, but it changes its meaning to 'a little' when added onto a telic stem.

- (17) a. *karax se* 'I quarrelled' ATELIC
 b. *po-karax se* 'I quarreled for a while' ATELIC
 c. *s-karax se* 'I quarrelled' TELIC
 d. *po-s-karax se* 'I quarreled a little' TELIC
 e. *iz-po-s-karax se* 'I quarreled with everyone' TELIC

Next, internal prefixes are part of the argument-structure domain of a verbal projection, and thus they may affect the argument structure of the projection they are adjoined to. Some internal prefixes can add a causer to the argument structure of intransitive verbs (18, 19), as well as change the aspectual class of the verbal projection (20). The external iterative prefix does not alter the aspectual class of the verb (21). In (20) the presence of the internal prefix brings forward a telic interpretation, although the direct object is a bare plural noun. In (21) both a telic and an atelic interpretation are available, as the time adverbial tests show. The actual interpretation of the sentence will be based on discourse context or temporal adverbials positioned higher in the structure.

- (18) decata se smjaxa na klouna
 the children refl laugh-aor/3pl at the clown
 ‘The children laughed at the clown.’
- (19) klouna raz-smja decata
 the clown PERF-laugh-AOR/3sg the children
 ‘The clown made the children laugh.’
- (20) xudožnikət na-risuva kartini za pet časa/*pet časa
 the painter PV-paint-aor/3sg pictures in 5 hours/*for 5 hours
 ‘The painter painted some pictures in 5 hours/*for 5 hours.’
- (21) xudožnikət pre-risuva kartini ?za pet časa/pet časa
 the painter pv-paint-aor/3sg pictures in 5 hours/for 5 hours
 ‘The painter re-painted (some) pictures in 5 hours/for 5 hours.’

Finally, as internal prefixes may change the telicity of the verbal projection they are a part of, they cannot be adjoined to telic predicates, whereas, external prefixes are not subject to this restriction, as they do not affect the telicity of the event.

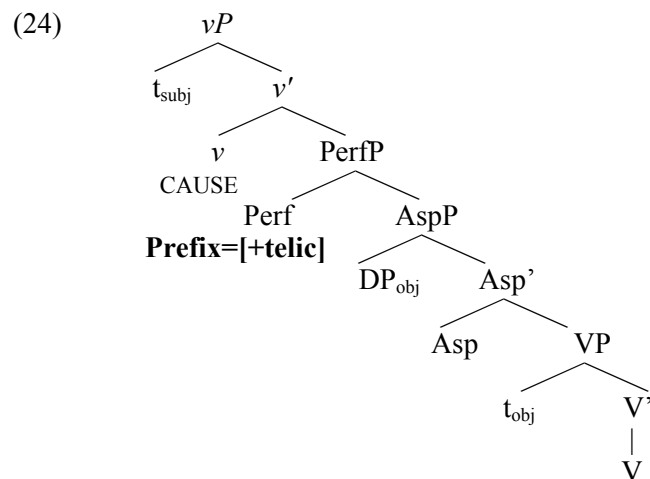
- (23) pre-kupja ‘re-buy’
 #na-kupja ‘finish buying’

Thus, internal prefixes have an effect both on the lexical aspectual class and on the argument structure of the verbal root they attach to. To summarize this section, we have seen that the majority of verbal prefixes in Bulgarian may affect the internal aspectual properties and in particular the telicity of the VP they are adjoined to. There are a limited number of external prefixes that pattern with adverbial modifiers. I suggest they are the exception rather than the rule of aspect marking in Slavic.

5. Phrase structure representation (Slabakova 2001a)

All of the representation in (24) is in l-syntax (lexical syntax) (Hale and Keyser, 1993). The double VP (lower VP and upper *vP*) structure reflects the semantic fact that events may be viewed as having at least two subevents (Dowty 1979): a causative subevent and a resultant state. The upper *vP* denotes the causative subevent and the lower VP denotes the resultant state subevent of the eventive classes. This decomposition is reflected by postulating a null CAUSE morpheme in the head of *vP*. Event participants (arguments) take part in the aspectual composition through case checking in AspP (accusative case) and TP (nominative

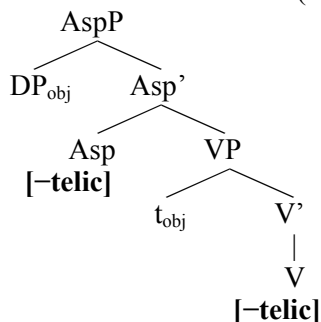
case). AspP is an important functional category for aspect construal. The object moves to the Spec of AspP to check accusative case and the verb moves to the head Asp (Borer 1994, van Hout 1996, Schmitt 1996, Travis 1992). It is at this point, in a spec-head relationship with the verb, that the verb imparts its temporal properties to the object DP in English. Depending on a verbal feature (or type of predicate) and on a nominal feature (quantized or not), the aspect of the whole VP is calculated (Verkuyl 1993). Whenever the object is of specified cardinality the interpretation is one of a telic event. Thus the independently needed mechanism of accusative case checking is also used for aspectual feature checking at the syntax-semantics interface. In Slavic, the telic morpheme is as a rule overt, it is a lexical morpheme, usually a prefix, on the verb. It occupies the head of a functional projection Perfectivity Phrase (PerfP). If a prefix is in the Perf^o, a position from which it c-commands the object, the interpretation is telic. If there is no prefix in Perf^o, then the interpretation is atelic. Consequently, the cardinality of the object in Slavic does not matter for aspectual interpretation, it is only the presence or absence of prefix that signals aspectual class.



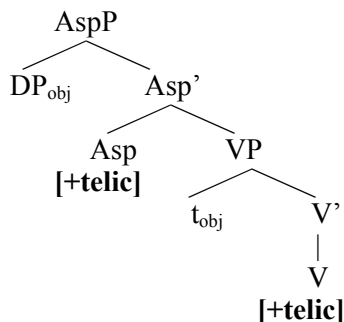
Below are the templates for the four aspectual classes. I believe states and achievement verbs are marked as [-telic] or [+telic] in the lexicon. In this sense, they are atelic and telic roots. When a stative verb takes a prefix, it can only encode inception of the state (e.g., *običam* ‘love’ – *za-običam* ‘fall in love’ – **na-običam* ‘finish loving’).

Achievements, on the other hand, being telic roots cannot be further telicized. Hence, the addition of perfective prefixes to achievement roots can only change the lexical meaning of the whole, but no changes in telicity obtain (e.g., *dam* ‘give’ – *pro-dam* ‘sell’ – *izdam* ‘betray’ – **na-dam* ‘finish giving’).

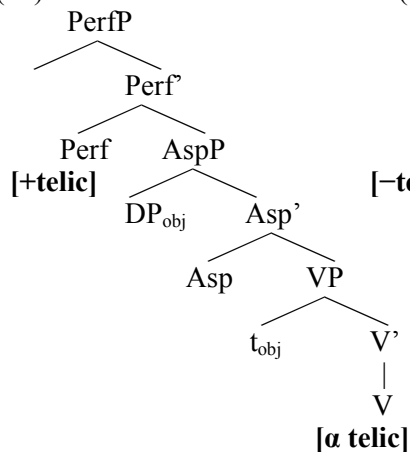
(25) STATE:



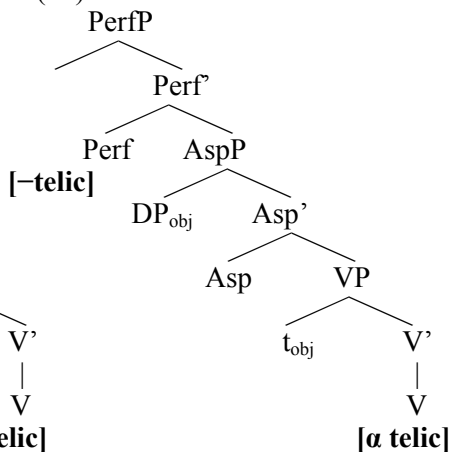
(26) ACHIEVEMENT:



(27) ACCOMPLISHMENT:



(28) ACTIVITY:



The bulk of Slavic roots are neutral with respect to telicity in the lexicon, that is, they are [α telic] roots. Whenever a telicizing derivational morpheme is merged in the template (an internal prefix), the lexical aspect value is calculated as perfective. Whenever there is no telicizing derivational morpheme merged in the template, the lexical aspect value is calculated as imperfective. The external prefixes are

adjoined on top of PerfP to obtain the configuration in (10). In the cases where perfective prefixes are stacked, adjunction also seems a plausible analysis. Only the one closest to the root is the telic morpheme, the others provide lexical meanings.

6. Psycholinguistics of perfectivity (Slabakova, 2001b)

Slabakova (2001b) addressed the question of whether constraints on aspectual semantics play a role in the lexical processing of Bulgarian native speakers. Two universal cognitive constraints were identified: ‘states cannot be delimited’ and ‘telic predicates cannot be further telicized.’ The study investigated how these are obeyed in the productive process of perfective prefix and stem combination in Bulgarian. First, an off-line task ascertained that Bulgarian native speakers have a default semantic interpretation for the prefixes under investigation, *na-*, *pre-* and *za-*. These were combined with a nonce root *camarja* as in (29).

- (29) Včera Ivan na-camari staja-ta
 yesterday Ivan PERF-verb/3sPast room-DET
 a/ Ivan finished verb-ing the room. <== CORRECT
 b/ Ivan continued verb-ing the room.
 c/ Ivan began verb-ing the room.
 d/ Ivan verb-ed the room again.

The prefix interpretation could not have come from the meaning of the root, or even in combination with the root meaning, since in this case the root had no known meaning for the subjects. Answer (c) was chosen in 80.4% of the times for *za-*; answer (a), or pure telicity, was chosen 86.4% for *na-*; and answer (d) was chosen 70% for *pre-*. The results of this experiment unequivocally confirmed the hypothesis that default meanings are part of the lexical representation for prefixes.

The second task in the study was a visual lexical decision task. One experimental condition tested whether achievements + purely telic prefixes are an illegal combination while achievements + lexical prefixes are a possible combination. Meanings of prefixes were based on the results of Experiment 1. The first category (n=10) combined existing achievement stems with purely telic *na-*, e.g. *na-umrja* ‘NA-die’. In this case, the purely telic prefix is trying to telicize an already telic stem, which should be an illegal combination. In the second category, achievement stems were combined with *pre-* (meaning ‘do something

again'), e.g., *pre-umrja* 'PRE-die'. Since it is possible to repeat an already completed event, these combinations were semantically plausible but still unattested. Results show clear legality effects in non-words composed of existing prefixes and stems, thereby supporting decompositional approaches to the mental lexicon. I argued that, after the process of morpheme search, there must be a process of checking for combinatory felicity of the morphemes activated in the lexical access.

7. Child language acquisition

The dominant theory for the child language acquisition of aspect is the Aspect First Hypothesis which claims that children initially use verbal morphology to mark aspect and not tense (Antinucci and Miller 1976, Bronckart and Sinclair, 1973). These claims were primarily based on Germanic and Romance languages acquisition. In the area of Slavic studies, Weist and colleagues (Weist *et al*, 1991; Weist *et al*, 1984) showed that children acquiring Polish produce appropriate tense morphology quite early (age 1;7) and that past tense appears on atelic lexical classes as well as on telic ones. Weist argued that what he called the Defective Tense Hypothesis cannot explain Slavic acquisition facts. Other studies that support this are Brun, Avrutin and Babyonyshev, 1999; Gagarina, 2000; Vinnitskaya and Wexler, 2001.

A recent study, Bar-Shalom 2002, confirmed the Weist *et al* findings. The study was based on naturalistic production of four monolingual children acquiring Russian, ages 1;6—2;11. The children produced the full range of aspectual lexical classes in all the tenses at the earliest age. In addition, they were found to produce “aspectual pairs” of perfective and imperfective verbs quite appropriately. Bar-Shalom argues against the Aspect First Hypothesis. I would like here to concentrate on another finding of hers: the lack of production errors. She found almost no errors in the derivational morphology of aspect, but the few errors, given in a footnote, are very interesting. Varja at age 2:4 produces *za-lomal* instead of *s-lomal* for ‘he/she broke’ and *iz-dali* instead of *ot-dali* for ‘they gave back’. Another subject, Andrej, telicizes the verb *umet* ‘be capable of’ into the form *na-umeli* ‘they learned how to do something’. If we think back to the psycholinguistic experiment, the children are using legitimate telicizing prefixes in legitimate combinations with roots. In other words, these are not telicity-marking errors but errors in the choice of the appropriate derivational prefix for the particular root.

A largely different picture emerges when we look at comprehension of aspect (Weist *et al.*, 1991; Vinnitskaya and Wexler, 2001; Stoll, 1998; Kazanina and Phillips, 2003; van Hout, 2005). Most of these studies, using different methodologies, show that 3-year-old Russian learners know the aspectual semantics of morphologically perfective transitive verbs. However, children have problems comprehending imperfective aspect. The imperfective has an ongoing and an incomplete interpretation, as well as a habitual one. “Children consistently associate perfective aspect with completion (Stoll, Vinnitskaya and Wexler, Weist *et al.*). They relate imperfective aspect to ongoing situations (Weist *et al.*, Vinnitskaya and Wexler) as well as completed ones (Kazanina and Philips in comprehension, Vinnitskaya and Wexler in production). This follows adult behavior. However, children never seem to associate imperfective with incomplete situations, whereas adults do. The conclusion that emerges at this point is that children have acquired the aspectual semantics of the perfective-imperfective, but do not employ it appropriately; “they have not (fully) acquired their aspectual discourse knowledge.” (van Hout, 2005). We will look at the van Hout study in a bit more detail. The children were shown a series of three pictures. In the first one Mickey is playing in the sand, the second shows a closed curtain, and the third is a blank which the child has to supply out of three choices (depending on the description of the event): a completed, and ongoing, and an incomplete castle-building situation.

(30) Experimental protocol from van Hout (2005):

Researcher: One day Mickey Mouse was on the beach. He was playing in the sand. He decided to build a sand castle and got to work. See? But the doors closed, so we couldn't see any further what happened. Let's ask Blue Bird to look behind the doors. Bird, what did you see there?

Bird: *Mickey was building a sand castle.*

Researcher: Is the right picture there?’

Given a perfective sentence, all subjects, from the 2-year-olds on, behaved like adults. In contrast, given an imperfective sentence, children, very much unlike adults, accepted all three kinds of situations: in all 3 conditions, they selected the completed, incomplete or ongoing situations without a clear preference for one over the other. van Hout argues that some knowledge of aspect is established at a very early age; yet children's behavior is not fully adult-like. Target knowledge of perfective aspect is in place, but some property of imperfective aspect is

still missing. van Hout's analysis is that children have acquired the aspectual semantics, but are not yet able to properly anchor the test sentence in the discourse. These findings are in agreement with many other studies in the literature on child language acquisition.

8. Second language acquisition

Here I will report on two studies of how Slavic languages are learned by anglophones, one study (Kozłowska-Macgregor, 2002, 2005) tests near-native speakers of Polish, while the other (Slabakova, 2005) investigates the interlanguage grammar of intermediate and advanced learners of Russian. Kozłowska-Macgregor studied the acquisition of the perfective, pofective and completive meanings of prefixes.² Using a semantic compatibility task, an end-state compatibility task, and a grammaticality judgment task, she tested adult native speakers (n=27), advanced adult L2 speakers (n=15), and adult near-native speakers of Polish (n=14) with English as a native language. To give you a taste of the semantic compatibility task, here is an example. Each test item (n=20) consisted of 2 pairs of sentences. The first pair (1 & 2) contained one sentence with a *po*-marked verb and one with the same verb but marked with a perfective prefix. The second pair (a & b) contained natural/logical continuations of the sentences in the first pair. The subjects' task was to pair up sentences 1 and 2 with sentences a or b based on semantic compatibility.

(31) Example test item from the semantic compatibility task

- | | | | |
|----|--|----|--|
| 1. | Za-bolal mnie zab.
perf(inchoat)-hurt me tooth
I got a toothache | 2. | Po-bolal mnie zab.
pofec-hurt me tooth
I had a toothache for a while |
| | a. | | Poszlam wiec do dentysty.
So, I went to the dentist's |

² Following Siewierska (1991), Kozłowska-Macgregor (2002, 2005) distinguishes between a pofective use of the prefix *po*- versus a completive use:

- | | | | |
|------|--|-----------|--------------|
| (i) | Po-czyta-lam | gazete. | (pofective) |
| | pofective-read-past | newspaper | |
| | 'I read a newspaper <u>for a while</u> ' | | |
| (ii) | Po-zamyk-al | okna. | (completive) |
| | compl-close-freq-past | windows | |
| | 'He <u>finished closing all</u> the windows' | | |

- b. W koncu poszlam do dentysty.
In the end I went to the dentist's

The scores given in the table below are based on accurate matching, in this case of 1 with a, and 2 with b.

Table 1. Accuracy scores on semantic compatibility task from Kowlovska-Macgreggor, 2005

<i>tested contrast</i>	advanced	near-native	control
A. po fective vs. perfective	60.5%	74.7%	92.2%
B. comple tive vs. perfective	69.1%	83.2%	91.7%
C. perfective vs. perfective	80.7%	96.4%	98.9%

Kozloska-Macgreggor shows in this study that progression from one level of complexity to another is possible. The near-native grammar is in most respects like the native grammar in terms of prefix interpretation. Semantic properties like boundedness and affecting a set of objects are already a part of the interpretive system. However, based on all tasks in the study, she argues that even in the near-native grammar, the representation of the highly complex, multifunctional prefix *po-* is incomplete.

Slabakova (2005) tests a much more basic interpretive knowledge: that of the perfective prefix entailments on the interpretation of the sentence. The main task consisted of a test sentence like *Masha (pri-) vezla detej domoj...* 'Masha drove (the) children home' and a choice of three paraphrases: a) but the children are not home yet; b) and the children are at home already; c) both answers above are possible. The test sentences were either perfective (*pri-vezla*) or imperfective (*vezla*). Three different conditions manipulated the form of the objects: either mass or bare plural nouns, singular count nouns (e.g., *buterbrod* 'sandwich'), or nouns modified by overt quantifier or demonstrative (e.g., *etot fil'm* 'this movie'). Results of the interpretation test on the perfective/imperfective contrast in Russian administered to 66 learners and 45 native speakers showed that the acquisition of the grammatical mechanism of telicity marking is not only possible but actually accomplished by the great majority of learners. Even the low proficiency learners as a group have successfully acquired the telicity marking mechanism in the L2.

9. Attrition of aspect

Finally, we will look at some experimental work on how aspect fares in the context of language attrition. The data come from attrited Russian speakers, a.k.a. American Russian speakers (Polinsky 1997, Pereltsvaig, 2005). Pereltsvaig assumes that perfective prefixes in standard Russian are grammatical aspect morphemes, and not lexical aspect markers. Based on the production errors of the American Russian speakers, she claims that their grammar diverges from that of standard Russian speakers. Pereltsvaig argues that the attrited speakers use grammatical aspect morphemes, i.e., the prefixes, to encode lexical aspect, and more specifically, a lexical semantic feature [\pm Bounded Path] that is encoded by the verb only. Thus simplified, the grammar of attrited Russian speakers can encode fewer aspectual distinctions, but is still a highly coherent grammatical system.

10. What next?

If lexical and grammatical aspectual meanings differ (e.g., telicity vs. boundedness, potential vs. actual endpoint reached, complete vs. finished), then Russian, Polish, Czech, etc. internal prefixes should be examined in detail to see which type of aspect they really encode, or both, or neither. In this sense, proposals detailing the syntactic behavior of specific multi-functional prefixes like *po-* in Kozłowska-Macgregor's work are going to be very important for an elaborate theory of Slavic aspectual composition. A virtually untouched area of research is the interaction of aspect and discourse, both within semantic and syntactic approaches. Within L1A, explaining the discrepancy between the very high accuracy production data and the experimental comprehension data, which suggests that not all meanings of the imperfect have been acquired might bring us unexpected revelations. Within L2A, teasing apart the semantic entailment knowledge of perfective prefixes versus the lexical knowledge of the prefixes as mental lexicon entries is the next big step. Within the general field of aspectology, and within Slavic aspectual studies in particular, it seems that the more we know, the deeper we need to dig next.

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