

Aspectual Pairing in Polish

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Aspectual Pairing in Polish

Aspectuele Paarvorming in het Pools
(met een samenvatting in het Nederlands,
en een samenvatting in het Pools)

Proefschrift

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door

Anna Katarzyna Młynarczyk

geboren op 22 december 1973 te Dąbrowa Górnicza

Promotores: Prof. dr. H.E. de Swart
Prof. dr. H.J. Verkuyl
Prof. dr. P.R. Blackburn

Objawienie

Zbigniew Herbert

dwa może trzy
razy
byłem pewny
że dotknę istotę rzeczy
i będę wiedział

tkanka mojej formuły
z aluzji jak w *Fedonie*
miała także ścisłość
równania Heisenberga

siedziałem nieruchomo
z załzawionymi oczami
czułem jak stos pacierzowy
wypełnia trzeźwa pewność

ziemia stanęła
niebo stanęło
moja nieruchomość
była prawie doskonała

zadzwoił listonosz
musałem wylać brudną wodę
nastawić herbatę

Sziwa podniósł palec
sprzęty nieba i ziemi
zaczęły wirować

wróciłem do pokoju
gdzież ten pokój doskonały
idea szklanki

rozlewała się na stole

usiadłem nieruchomo
z załzawionymi oczami
wypełniony pustką
to znaczy pożądaniem

jesli zdarzy mi się to raz jeszcze
nie ruszy mnie ani dzwonek
listonosza
ani wrzask aniołów

będę siedział
nieruchomy
zapatrzony
w serce rzeczy

martwą gwiazdę

czarną kroplę nieskończoności

Revelation

by Zbigniew Herbert

two perhaps three
times
I was sure
I would touch the essence
and would know

the tissue of my formula
made of the allusions as in
the Phaedo
had also the rigour
of Heisenberg's equation

I was sitting immobile
with watery eyes
I felt my backbone
fill with sober certainty

earth stood still
heaven stood still
my immobility
was nearly perfect

the postman rang
I had to pour out the dirty wa-
ter
put on the tea

Siva lifted his finger
the furniture of heaven and earth
started to whirl again

I returned to my room
where is that perfect peace

the idea of glass
was being spilled all over the
table

I sat down immobile
with watery eyes
filled with emptiness
that is with desire

If it happens to me once more
I shall be moved neither by
the postman's bell
nor by the shouting of angels

I shall sit
immobile
my eyes fixed
upon the heart of things

a dead star

a black drop of infinity

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Chapter 1

A little Polish Lesson

This thesis studies aspectual pairing in contemporary Polish. The purpose of this chapter is to set the stage for the work that follows. We begin in Section 1.1 by introducing the reader to some basic concepts of Polish aspect at the level of verb.¹ We hope this section will give readers with no previous knowledge of Polish some grasp of the role verbs play in the Polish aspectual system. We also want to convey a sense of why it is that many linguists regard the Polish aspectual system as complex, even somewhat mysterious. By the end of the section the reader will be acquainted with some notions that play an important role in this thesis (for example, what aspectual pairs are) and will have a basic awareness of some of the issues that make the study of Polish aspect difficult and controversial. We conclude the section by briefly sketching the central claim of the thesis: namely that the vast majority of Polish verbs really do come in aspectual pairs, and that far from being a mysterious process, aspectual pairing in Polish is simple and regular, and gives rise to a semantically significant verb classification. Following this, in Section 1.2 we discuss in detail the evolution of the Polish aspectual system. Although the argumentation in this thesis is synchronic, we feel that a diachronic perspective on aspectual pairing in Polish is crucial for a full understanding of the issues involved. In particular, we feel that a diachronic perspective enables us to see how the kind of verb classification we shall propose later in the thesis could have arisen; this section supplies the necessary background information. Finally, in Section 1.3 we present a chapter by chapter overview of the work that follows.

1.1 Aspect in contemporary Polish

This thesis is concerned with aspectual pairing in contemporary Polish. But what is aspect and what do we need it for? In what follows we will attempt to give an informal explanation of some of the most notable features of the Polish aspectual system. We

¹Aspect is a phenomenon that plays a role at many levels of language, such as the verb phrase level, the sentential level, and the discourse level. As the title of this thesis indicates, this thesis is almost wholly concerned with the role of verbs in the Polish aspectual system.

shall try, as far as possible, to avoid theory-laden terminology. Roughly speaking we shall attempt to explain the basic concepts in much the same way that a teacher of Polish as a second language would explain them to a student.

In English, if you want to say that (at the present moment) something is happening, then the sentence in which you describe the activity of interest will be in the present progressive tense: for example, *Janusz is writing a letter*. On the other hand, if you want to assert that some state holds (at the present moment) you will use a sentence in the simple present tense: for example, *Marta believes Piotr*. In Polish, the corresponding sentences would be *Janusz pisze list* and *Marta wierzy Piotrowi*.² The verbs involved (*pisać* ‘to write’ and *wierzyć* ‘to believe’) are called *imperfective* verbs, and their occurrences in the above sentences are in the present tense. Present tensed imperfective verbs can be used either to assert that a process is ongoing at the present moment (as *Janusz pisze list* does) or that a state holds at the present moment (as *Marta wierzy Piotrowi* does). Although in English we are forced to use distinct tense forms, in Polish we are not.

Time passes, and present states of affairs become past. If you want to talk about them, you need to ‘move back’ in time to the particular moment at which they were true. In English you do that by putting the sentence into the past tense. Imagine you want to talk about the writing of a letter some time ago by Janusz, or about Marta’s (now long vanished) belief in Piotr. All you need to do in English is transpose the previous present tensed sentences into the past tense: *Janusz was writing a letter* and *Marta believed Piotr*. And you can do the same in Polish. You simply put the sentences in the past tense (Polish has only one) to obtain *Janusz pisał list* and *Marta wierzyła Piotrowi*. Just as before, you are presenting the process as ongoing and the state as holding at a particular time — however, because you used the past tense, you are expressing that the particular moment belongs to the past. (A book on Polish grammar would tell you that what you did was to change the tense of the sentences while leaving their aspect intact.)

So far, the two languages seem fairly similar. In both, tense inflections serve to locate events and states at various temporal locations, and if anything it is English (with the distinction it draws between the present progressive and the simple present tense) which seems slightly more exotic. But now for something intrinsically Polish (something which has counterparts in other Slavic languages). Every Polish native speaker knows that the verb *pisać* does not live alone. It has a twin, *napisać*. And this is the verb that native Polish speakers reach for when they need to talk about completed actions. For example, whereas an English speaker would (once again) change the tense and say *John wrote a letter*, a Polish speaker would reach for the twin verb and say *Janusz napisał list*. This asserts that the Janusz letter-writing activity occurred in the past (the tense inflection gives us that) and that the activity was completed (the use of the verb *napisać* tells us this). The pair *pisać/napisać* is the first example in this thesis of a Polish aspectual pair.

Now, the native English speaker who has never encountered Polish before may feel

²In the second sentence *Piotr* is written *Piotrowi* because the verb *wierzy* needs its argument in the dative case.

slightly suspicious. Why do we say that *pisać* and *napisać* are twins? That is, why do we talk as if they were distinct verbs? After all, it is fairly obvious that *napisać* is formed from *pisać* by some sort of prefixation process. Moreover the relationship between the two forms seems very close — every bit as close as the relationship between (say) the English words *writing* and *wrote*. But we're not tempted to describe *writing* and *wrote* as 'twin verbs' (they're clearly just inflectional variants of one verb). So what justifies our use of this fanciful terminology for the Polish verbs?

This question is not as naive as it may seem, indeed it opens the door to a host of issues that have been debated for well over a century, as we shall see in the following chapter. But although we cannot dismiss this question, we can immediately point to some facts which show that, whatever the relation between Polish aspectual twins may be, it is far more interesting than the relation that holds between (say) *writing* and *wrote*.

For a start, while every Polish native speaker can instinctively reach for a verb's aspectual twin, there is not one 'twinning mechanism' but two. In *pisać/napisać* we have an example where the perfective twin is built by prefixation of an underlying imperfective verb. But there are verbs where the underlying verb form is perfective (for example, *kupić* 'to have bought') and an imperfective form is built from it by a process that is usually called 'suffixation' (the imperfective twin of *kupić* is *kupować* 'to be buying'; as this example shows, more than mere suffixation can be involved in this process). Furthermore, there are a handful of Polish aspectual pairs where it is meaningless to talk of a 'twinning mechanism'. For example *brać* 'to be taking' has as its aspectual twin the perfective verb *wziąć* 'to have taken'. There is no morphological link whatsoever between these forms — we simply have a pair of aspectually paired verbs, one of which deals with ongoing actions, the other with completed actions. (Such twins are traditionally called *suppletive pairs*. They are a remnant of an earlier stage in the evolution of Polish, and only a handful of them remain, but as the *brać/wziąć* example shows, some suppletive pairs are heavily used.) In short, whatever the link between the verbs in an aspectual pair is, it is evidently more interesting (and more complex) than the link between English verb forms such as *writing* and *wrote*.

Second, it is important to realize that each verb in a verb pair is 'self-contained' as far as tense inflections are concerned. For example, above we used *napisać* in a past tensed sentence, but even though *napisać* deals with completed reading events there is nothing intrinsically past-tensed about it: it *can* be used in the present tense, and indeed so can *kupić* and *wziąć* and all Polish perfective verbs. All in all, there is at least prima-facie motivation for referring to pairs like *pisać/napisać*, *kupić/kupować*, and *brać/wziąć* as 'twin verbs'.

As we've just mentioned, perfective verbs can be used in the present tense. But what do they mean when used in this way? Actually we have to be careful when talking about 'the' meaning of Polish perfective verbs, as for some of them there is a striking semantic irregularity. But let's put this aside for a couple of paragraphs and concentrate on 'ordinary' Polish perfectives. What is their present tense meaning?

Consider, for example, the sentence *Janusz napisze list*. Given the aspectual infor-

mation (the use of *napisać* rather than *pisać*) this sentence is asserting the completion of some writing episode. However in this sentence *napisać* has the present tense form *napisze*. Now, logically speaking the completed writing cannot be taking place at the present moment (for if it was taking place now, it could not be completed) and in fact, this morphologically present tensed sentence behaves semantically like a future tensed sentence: the best English translation for it is probably *John will have written a letter*.

Let's consider more examples, this time involving the pair *kupić/kupować*. The imperfective member of this pair is *kupować* ('to be buying') and the perfective member is *kupić* ('to have bought'). So to assert that a buying activity is ongoing, a Polish native speaker would reach for the verb *kupować*. The present tensed usage of *kupować* locates the buying at the utterance time: for example *Piotr kupuje książkę* means *Piotr is buying a book*. The past tense usage of *kupować* locates the buying at some past time: for example *Piotr kupował książkę* means *Piotr was buying a book*. On the other hand, to assert that a buying activity is completed, a Polish native speaker would reach for the twin verb *kupić*. The past tense usage of *kupić* locates the completed buying event at some past time: for example *Piotr kupił książkę* means *Piotr bought a book*. The present tensed usage of *kupić* locates the completed buying event at some future time: for example *Piotr kupi książkę* means *Piotr will have bought a book*.

Let's summarize what we have learned from the writing and buying examples. First, in these examples the semantic relation between the perfective and imperfective forms was clear: the perfective form was for completed processes, the imperfective for ongoing processes. That is, they code for a simple binary opposition: the usual Polish terminology for this opposition is *dokonany* (completed) versus *niedokonany* (non-completed). Moreover, the distinction between completed and ongoing was manipulated by the Polish tense system in a straightforward way; the only point that needs to be kept in mind is that perfective verbs in the morphological present tense have a future tense readings. It is also worth emphasizing that our talk in the above examples of Polish native speakers 'reaching' for the aspectually appropriate verb should be taken seriously. There is no native speaker intuition concerning 'directionality' or 'difference of process' in the use of imperfectives and perfectives. As we have seen, in some verbs the perfective form (for example, *napisać*) is formed out of an underlying imperfective form (*pisać*), via a prefixation process that many linguists would argue is a clear example of derivational morphology. On the other hand, in some verbs the imperfective form (for example, *kupować*) is formed out of an underlying perfective form (*kupić*), via a 'suffixational' process that many linguists would argue is a clear example of inflectional morphology. Furthermore, in yet other verbs (namely verbs in suppletive pairs such as *brać/wziąć*) all linguists (as far as we are aware) would agree that there is no morphological link whatsoever between the two verbs. But the native Polish speaker is blind to this diversity — the native speaker simply chooses the appropriate member of the pair (perfective or imperfective) appropriate for the communicational task at hand. There is no consciousness that considerable theoretical complexity hides beneath the surface; as far as the native speaker is concerned, the workings of the pairing system are a 'black box'.

As we have presented it so far, the semantic distinctions drawn by the Polish as-

pectual system are very regular: the choice between imperfective and perfective forms corresponds to the binary opposition between ongoing and completed. However, as we mentioned above, there is a striking semantic irregularity: perfectives of state verbs don't code for completion at all — in fact they code for exactly the reverse. Let's consider the matter.

We have already given examples involving a state verb, namely *wierzyć* ('to believe'). As we mentioned, this is an imperfective verb (thus it is better translated as 'to be believing'). We saw that the English sentence *Marta believes Piotr* could be rendered in Polish as *Marta wierzy Piotrowi*, and that the English sentence *Marta believed Piotr* could be rendered as *Marta wierzyła Piotrowi*. Thus, as far as imperfective state verbs are concerned, there is nothing semantically anomalous: the use of the imperfective simply means that the state is holding at some time.

But every Polish native speaker knows that *wierzyć* has a perfective twin, namely *uwierzyć*. But what does it mean? Well, when used in the past tense, as in *Marta uwierzyła Piotrowi*, it means *Marta began/had begun to believe Piotr*, and when used in the present tense, as in *Marta uwierzy Piotrowi*, it means that *Marta will start to believe Piotr*. That is, far from asserting the completion of the state of believing, *uwierzyć* is a way of picking out the *starting* point of the belief. To use the traditional terminology, *uwierzyć* has an *inchoative* (or *ingressive*) reading, and so do all other perfective Polish state verbs.

This is an interesting anomaly. Moreover it is a widespread one. It is not confined to Polish, or even to the Slavic languages — Comrie observes that there are similar effects in Spanish, Ancient Greek, and Mandarin Chinese (Comrie, 1976, page 18-20). Unfortunately, it is hard to get a solid theoretical handle on why perfectivised state verbs should behave like this. There is perhaps an intuition that whereas it is the endpoint that is important to processes, it is the beginning (or 'inception') that is important to states. If this were so, then perhaps we could argue that the function of a perfective verb was to view an eventuality from the perspective of its most important point: this could explain why perfective process verbs have completion readings and perfective state verbs have inchoative readings. However, in the absence of any really convincing account of why it is that inceptions are crucial to states and conclusions crucial to processes such an argument would merely shift the problem rather than solve it. In this thesis we are not going to try and explain why perfective state verbs behave in this way; we'll simply accept their inchoative readings as a fact of contemporary Polish.

That concludes our informal introduction to the role verbs play in the aspectual system of contemporary Polish. And, given our account, it must seem that verbs play a rather straightforward and (with the exception of perfective state verbs) semantically regular role. However, at the start of the chapter we warned the reader that the study of aspect in Polish (and indeed, in Slavic languages generally) is regarded as difficult and controversial. The following quotation gives an idea of the sentiments that the study of aspect sometimes inspires:

The study of aspect has been likened to a dark and savage forest full

of “obstacles, pitfalls, and mazes which have trapped most of those who have ventured into this much explored but poorly mapped territory.” (Macaulay, 1978, page 416ff.), quoted after (Binnick, 1991, page 135)

Why the controversy? Quite simply, the informal account of Polish aspect which we have just given — which we think is close to the kind of pre-theoretical account of Polish aspect you will find in elementary texts — simplifies (perhaps oversimplifies) a number of issues. First, our informal account treats prefixation and suffixation as simply two alternate ways of producing aspectual pairs: many Slavic linguists would object to this. Second, our informal account did not draw attention to a complicating factor concerning prefixation in Polish. Thirdly, the account given above was verb centered and emphasized the role of certain (temporal) binary oppositions (such as completed versus ongoing). However some recent Western work has emphasized the role of the verb phrase level and the importance of non-temporal notions in the analysis of Slavic aspect. Let’s briefly discuss each of these issues.

Prefixes versus suffixes

Many Slavic linguists draw a sharp distinction between prefixes and suffixes. They view prefixation as a derivational process, and ‘suffixation’ as an inflectional (or grammatical) process. Such linguists typically view aspect as an ‘obligatory grammatical category’ of Polish verbs. Now, grammatical variants of a verb are not thought of as differing in lexical meaning (for example, in English we don’t think of *writing* and *wrote* as differing in lexical meaning, they merely differ as regards tense). Moreover, the purpose of a derivational process is to create new words (and, hence, presumably, to embody new meanings). If all these ideas are combined (and traditional Slavic linguists tend to combine them) then we reach the following conclusions:

1. A pair such as *kupić/kupować* (and indeed any pair in which an imperfective form is built from a basic perfective form by suffixation) is a ‘true’ aspectual pair: they are grammatical variants of each other (as suffixation is a grammatical operation) and there is no difference in lexical meaning, only in aspectual value.
2. A pair such as *pisać/napisać* (and indeed any pair in which a perfective form is built from a basic imperfective form by prefixation) is not a ‘true’ aspectual pair: they are entirely different words (prefixation being a derivational operation) and there is a difference in lexical meaning in addition to the change in aspectual value.

While this view has a certain elegance, it also has a clear drawback: it fails to address the native speaker intuition that verbs come in aspectual pairs. The vast majority of aspectual pairs in Polish are formed via prefixation — if only the verb pairs formed by suffixation are legitimate, verb pairing in Polish becomes a marginal phenomenon.

Moreover, the viewpoint sketched above (which is probably fairly close to the ‘received’ view — if such a thing exists — in Slavic linguistics) generates controversy. Why? Well, it is certainly true that prefixisation in Polish is predominately derivational. Here, for example, is a table listing various verbs formed by prefixisation from *pisać*:

<i>pisać</i> ‘to write-impf’	<i>napisać</i> ‘to write-perf’
	<i>popisać</i> ‘to write-perf’
	<i>podpisać</i> ‘to sign-perf’
	<i>przepisać</i> ‘to copy-perf’
	<i>przepisać</i> ‘to prescribe-perf’
	<i>dopisać</i> ‘to add more writing-perf’
	<i>spisać</i> ‘to make a list of/to draw up-perf’
	<i>wpisać</i> ‘to write in-perf’
	<i>zapisać</i> ‘to write down/to take down-perf’

Clearly the majority of these verbs have distinct (though related) lexical meanings from *pisać*. However matters are far less clear with *napisać* (a verb we have already discussed) and indeed with *popisać* (a verb we will frequently encounter later). Even supporters of the ‘suffixisation only’ view of aspectual pairing are hard pressed to point to any concrete change in lexical meaning in these examples: both verbs change the aspectual value of *pisać*, and assert that the writing is completed (but there is an interesting difference between *napisać* and *popisać*, which we will analyse in detail later in the thesis, concerning the kind of writing episode that was completed). Some supporters of the ‘suffixisation only’ view have developed ingenious arguments to show that some extra component of meaning change (over and above completion) has crept in, while opponents of this view have developed equally ingenious arguments to show that they have not.³ Other ‘suffixisation only’ writers concede that the meaning change involved is minimal and try to develop a theoretical position which accommodates such intimately linked pairs as *pisać/napisać* (and *pisać/popisać*). For example, Czochralski, in what is probably the most detailed investigation of the Polish aspectual system describes *pisać/napisać* as being an example of ‘resultative Aktionsart’ that has given rise to ‘secondary pairs’ in order to fulfill a communicative need (Aktionsart is a German word which means ‘manner of action’; we discuss Aktionsart and its relationship with aspect in the following chapter).

One final remark. The received view on suffixisation is not completely watertight (as some ‘suffixisation only’ authors such as Isačenko concede). For a start (as the *kupić/kupować* example shows) ‘suffixisation’ can be a complex process: here there is a vowel change (*i/a*), and a suffix *-ow-* is also added (one could also say that *-i-*

³A note for readers who know no Polish. All the verbs in the above table are perfective. In Polish, whenever a verb is derived from a basic imperfective verb by prefixisation, the resulting verb is perfective. So the dispute is not about whether prefixisation forms perfective verbs from basic imperfective verbs (it is clear that this always happens) — rather it is about whether it is possible for a prefixisation to create a perfectivised verb without changing the lexical meaning.

is replaced by *-owa-*). Moreover, ‘suffixisation’ is a process that can be involved in lexical change (though not in nearly such a productive way as prefixisation is). We’ll have more to say on this topic later in the thesis.

Empty prefixes

There is another important remark we need to make about the aspectual twins formed by prefixisation: the formation process is non-uniform. Although we did not emphasize it in our informal introduction, the alert reader will have noticed that the aspectual twin of *pisać* was formed using the prefix *na-*, whereas the aspectual twin of *wierzyć* was formed using the prefix *u-*. And this is a general phenomenon in Polish — different imperfective verbs are linked to their perfective aspectual twins via a seemingly haphazard choice of prefixes. To give three more examples, the perfective aspectual twin of *robić* (‘to be doing/making’) is formed using the prefix *z-*, the perfective aspectual twin of *gotować* (‘to be cooking’) is formed using the prefix *u-*, and the perfective aspectual twin of *czytać* (‘to be reading’) is formed using the *prze-*. That is, in Polish there is no special prefix the only task of which is to form a perfective aspectual twin out of a basic imperfective verb (indeed, as far as we are aware, no Slavic language has such a prefix, though Lithuanian, a language from the closely related Baltic group, apparently does (Hewson and Bubenik, 1997, page 84)). To be sure, there are some rule-of-thumb regularities about which prefixes go with which verbs, and there is one prefix (namely *z(a)-*) which is used more than any other. Nonetheless, non-Polish speakers who want to learn the language face a tedious task here: the perfective twins corresponding to basic imperfective verbs via prefixisation simply have to be learned by heart.

Time to introduce an important piece of terminology. The prefix used to form the aspectual twin of an imperfective verb is traditionally called the ‘empty prefix’ for that verb. For example, the empty prefix for *pisać* is *na-*, and the empty prefix for *wierzyć* is *u-*. Why ‘empty’? The idea is that the ‘empty prefix’ does not change the meaning of the basic imperfective verb — it simply forms a twin verb that differs only in aspectual value (it will be perfective). Of course, someone who takes a ‘suffixisation only’ view of aspectual pairing will deny that there are any empty prefixes in Polish at all — or to be more precise, such a person will deny that any prefixisation can ever truly be empty. A ‘suffixisation only’ theorist will insist that every prefixisation must always contribute some lexical meaning change in addition to the change in aspectual value.

Another remark. Originally, Polish prefixes were prepositions. If we think about these items independently, then they can have a prepositional meaning. Simplifying somewhat (these prepositions can have several meanings) we might say that *na-* means ‘on’, *z-* means ‘with’, *u-* means ‘at’, and *prze-*, if associated with the preposition from which it derives (namely, *przez*), means ‘through’. However they do not retain these meanings when used as prefixes to build aspectual pairs. To put it another way, in the complex perfective verbs formed by prefixisation, the prefixes are ‘emptied’ from their lexical meaning; they merely contribute the completion meaning to the basic verb.

Or at least, that's the way that someone who believes that prefixation is a legitimate way of forming aspectual twins would view matters. Some authors who follow a 'suffixation only' view argue that empty prefixations can never be truly empty precisely because the prefixes carry with them some remnant of the original prepositional meaning, and that this remnant gives rise to change in lexical meaning.

Verb versus verb phrase

Our informal presentation of Polish aspect was verb-centered and stressed the role of certain binary oppositions in the semantics of aspect (ongoing versus completed for most verbs, and ongoing versus inchoative for state verbs). Recent Western work suggests that this traditional view may be oversimplified. The title of a recent book by Henk Verkuyl gives a good indication of the path explored in this line of work: "*Aspectual issues. Structuring Time and Quantity*". The word 'time' will not come as a surprise — but what about 'quantity'?

Roughly speaking, these theories emphasize that the role the verb phrase plays in the semantics of aspect must not be underestimated, and stress the link between Slavic perfectivity/imperfectivity and Germanic determiners. Some versions of these approaches suggest that there is a link between Slavic markers of perfective aspect and Germanic definite articles; other versions stress the link between imperfectivity and the lack of a definite article. For example, some researchers in this tradition argue that perfectivity (which we introduced above simply in terms of temporal completion) requires an argument whose quantity is determinate: while we can say *Piotr was drinking/drank vodka* (note that *vodka* in this imperfective sentence has no determiner), in its perfective counterpart we have to say that *Piotr drank the vodka* (note the definite article *the*).

This line of work is important for several reasons. For a start, such ideas lie at the heart of much recent formal work. Moreover, by drawing attention to the role of the verb phrase, and the importance of non-temporal concepts, they suggest that traditional Slavic approaches may be too narrow. Thirdly, the link made between Germanic determiners and Slavic aspectual markers emphasizes that a deeper understanding of Slavic aspect may require not merely comparison amongst the Slavic languages themselves, but comparisons with more distantly related languages.

Sketchy as the above remarks are, the reader should now be in a position to appreciate why the study of Polish aspect can get complicated. Given this, it may be useful to outline right away the line this thesis is going to follow, and the position it takes on the three issues just mentioned.

The starting point of this thesis is the view that the native speaker intuition that Polish verbs come in pairs is an intuition well worth taking seriously. We will do so as follows. First, we abstract away from the difference between derivational and inflectional processes and simply talk of *formants*. We will isolate four formants: empty prefixes, the delimitative *po-* prefix, the semelfactive *-na-* suffix, and the type of 'suffixation' discussed above (as we shall see, all four formants have long been discussed in the aspectual literature). Secondly, we define what it means for a pair of verbs to

be aspectual twins. Crucially, we do this in a way that does *not* appeal to subtle semantic judgments. In our view, the sort of semantic judgments made in discussions of (say) the existence or non-existence of empty prefixes are not sufficiently robust to form the basis for a theory. Instead, we introduce a generalised form of a classic test known as the *secondary imperfectivisation test*, and define a mirror image test called the *secondary perfectivisation test*. Roughly speaking, the secondary imperfectivisation test tells us that a perfective verb v_2 formed from a basic imperfective verb v_1 by one of our formants is an aspectual twin of v_1 only if it is impossible to obtain another imperfective verb v_3 by applying a formant to v_2 . Under this criterion, *napisać* turns out to be an aspectual twin of *pisać*, for it is not possible to apply any further formants to *napisać*. To put it another way: the only way back to imperfectivity is to ‘undo’ the *na-* prefixation and return to the original imperfective verb *pisać*. That is (to use the traditional terminology) *napisać* cannot be ‘secondarily imperfectivised’. On the other hand, *podpisać* (‘to have signed’) which like *napisać* is formed from *pisać* by the application of a prefix, is *not* an aspectual twin of *pisać*. Why not? Because it *is* possible to ‘secondarily imperfectivise’ this verb. In particular, by making use of the ‘suffixation’ formant we obtain *podpisywać* (‘to be signing’). That is, *podpisać* fails the secondary imperfectivisation test, and hence it is *not* an aspectual twin of *pisać*. Rather, it should be thought of as a basic perfective verb, whose aspectual twin is *podpisywać*.

We then ask a rather simple question which does not seem to have been asked before: which verbs form aspectual pairs with which formants? When we classify Polish verbs on this basis (using the secondary imperfectivisation and perfectivisation tests as our criteria for what constitutes an aspectual pair) we discover that there are five aspectually basic classes of Polish verb (and a further eight classes formed from them by formant application). And something interesting emerges. Although our verb classes were defined purely in terms of the formants they use (that is, they were not defined using semantic criteria) they turn out to have semantic significance: class₁ verbs turn out to be states or gradual transition verbs, class₂ verbs turn out to be process verbs, class₃ verbs are culminating process verbs, class₄ verbs are unitisable process verbs, and class₅ verbs are culmination verbs (the terms ‘culminating process’ and ‘culmination’ are taken from Moens and Steedman (1987); we use the term ‘unitisable process’ to describe such Polish verbs as *pukać* (‘to be knocking’) which describe eventualities which can be broken up into a sequence of ‘units’).

The resulting system is a mixture of traditional and non-traditional ideas. To give one of the novel consequences of our analysis, the verbs in some of our imperfective verb classes turn out to have more than one perfective twin. For example, according to the secondary imperfectivisation test, not only is *napisać* as aspectual twin of *pisać*, so is *popisać*. Now, *pisać* is a class₃ verb (that is, a culminating process verb) and according to our classification all class₃ have two perfective twins, one formed by its empty prefix and one formed by the delimitative *po-* prefix. Indeed, according to our analysis the verbs in class₄ (that is, the verbs we call unitisable process verbs) have three perfective twins!

On the other hand, much turns out to be fairly traditional: imperfectives code for

ongoing eventualities, and perfectives (with the exception of perfective state verbs which code for inchoativity) code for completed eventualities. But there is an important twist: some perfectives are fussy about the *kind* of completed eventuality that they want. For example, consider the imperfective verb *pisać* ('to be writing'), a culminating process verb. Its perfective twin *napisać* demands that a reading event *which reached its culmination point* be completed, whereas its perfective twin *popisać* demands that a reading event which did *not* reach its culmination point be completed. Perfective forms of class₄ verbs (unitisable process verbs) can be even fussier. For example, the verb *pukać* ('to be coughing') belongs to class₄ (that is, it is a unitisable process verb) and hence has three perfective twins: *puknąć*, *popukać* and *zapukać*. These demand the completions of a minimal, a non-minimal, and an arbitrary, knocking event respectively (the form *puknąć* is what would traditionally be called the 'semelfactive' form of the verb).

We have given few details here, but as we shall see in Chapters 4 and 5 it is possible to make these ideas precise and to develop a model-theoretic semantics that draws the kinds of semantic distinctions just noted. So instead of discussing them further here, let us consider where this thesis stands on the three issues mentioned above.

As should be clear, the approach developed in this thesis differs from many traditional Slavic analyses by taking seriously the native speaker intuition that most Polish verbs are paired. This means that we accept both prefixation and suffixation as legitimate methods of pair formation: for us, they are simply alternative formants, and have equal theoretical status. On the other hand, we agree with traditional views that the level of verb has a special role to play in Polish aspect. In our view, the verbal level is the ultimate source of the aspectual distinctions made in contemporary Polish. While the role of verb phrases is clearly important, it only comes into play after the verb has made its contribution. As the semantic account we shall develop in Chapter 4 (and formalize in Chapter 5) will make clear, important (temporal) semantic contributions are made at the verbal level. Finally, we feel that the traditional view that verbal-level aspectual distinctions in Polish are concerned with temporal binary oppositions is essentially correct. But to this traditional view we add the observation that certain classes of imperfective verbs (namely, culminating process verbs and unitisable process verbs) have more than one perfective twin. These 'extra' twins enable further distinctions to be drawn about the kind of eventuality that has been completed.

1.2 The evolution of Polish aspect

The reader should now have a reasonable picture of the basics of verbal aspect in contemporary Polish, some understanding of why the study of Polish aspect can get complicated, and a preliminary idea of where this thesis is heading. But our account so far has been synchronic, and in our view a full understanding of Polish verbal aspect requires a diachronic perspective too. Accordingly, in this section we describe in detail how verbal aspect in Polish evolved. Readers uninterested in this topic can skip directly to the end of this chapter (where they will find a chapter-by-chapter overview of the thesis) without losing track of the main line of argument (though such readers

should be warned that one section of the final chapter requires some familiarity with the material presented here).

We start by presenting the following schematization of the evolution of Polish aspect:

1. Proto Indo-European family: until 30th century B.C.
2. Development of the proto-languages of the Indoeuropean language families: 30th – 11th/10th century B.C.
3. Formation of the Balto-Slavic family: 10th – 6th B.C.
4. Development of the Proto Slavic family: 6th/5th century B.C.– 6th/7th century A.D.
5. Development of the West-Slavic family: 7th – 10th century.
6. Old-Polish: 10th – 15th/16th century.
7. Middle Polish period: 16th — 18th century (1772).
8. New Polish period: 1772 – 1939.
9. Contemporary Polish.

This periodization of the Polish language is conventional, and parts of it are more closely connected to social and national developments than to linguistic realities. Nonetheless, it will be a useful guide in what follows.

1.2.1 Aspect in Proto Indo-European

Aspect in Proto Indo-European was a lexico-wordformational category: the basic aspectual opposition between completed and ongoing events was formally expressed by the opposition between *flexion themes*. The Proto Indo-European flexion theme consisted of the root (that is, the lexical element) and the theme suffix (that is, a theme-forming element); some flexion themes were identical to the root. A flexion theme together with a flexion ending made up a Proto Indo-European verb form. Some researchers refer to the two flexion themes as ‘aspectual themes’ (Długosz-Kurczabowa and Dubisz, 2001, page 283-284).

Długosz-Kurczabowa and Dubisz (2001) write that the differentiation of aspectual themes characteristic for Proto Indo-European are echoed in Greek (for example, Old Greek imperfective *deik-ny-nai* ‘to be showing’ and perfective *deik-s-nai* ‘to have shown’) and Latin (for example, imperfective *dīc-ēbā-m* ‘I was saying’ and perfective *dīx-i* ‘I said’) (Długosz-Kurczabowa and Dubisz, 2001, page 283).⁴

⁴The comparison of the differentiation of aspectual themes of Proto-Indoeuropean to the aspectual systems of Greek and Latin may give a very first impression of how the aspectual encoding by means of aspectual themes might have look like. But it should be kept in mind that there are important differences between the Latin and the Greek aspectual systems (Kuryłowicz, 1964, page 90ff.).

Late Proto Indo-European

The Late Proto Indo-European period was marked by the development of dialects, which would later crystallise into proto languages of the Indoeuropean language family (such as Proto Italic, Proto Germanic, Proto Slavic, and so on). The interactions between these dialects triggered several morphological processes, an important example of which is the process of ‘morphological perintegration’: a shift of the border between root and formant in a word as a result of the secondary decomposition of that word into morphological elements.

In the process of morphological perintegration the three-element structure of the Late Proto Indo-European verb (consisting of a lexical element, a theme-forming element and an ending) started to shift into a two-element structure (consisting of a lexical element and an ending). As a result of this process, the flexion theme of the verb did not consist any longer of two elements (that is, a lexical element and a theme-forming element), but formed one single unit (in which the two elements were collapsed). The transformation of the three-component structure of a verb into a two-component structure proceeded slowly, so that in the Proto Slavic period there still existed verbs which were not yet affected by this morphological change. The process of morphological perintegration was conditioned by phonetic changes and tendencies to analogy, and was connected to the disappearance of the paradigm-forming function of theme-forming suffixes (Długosz-Kurczabowa and Dubisz, 2001, page 266).

As the distinction between the two flexion themes was becoming less and less sharp, it was getting harder and harder to clearly mark the fundamental distinction between completed and ongoing events; the aspectual system of the Late Proto Indo-European started to have gaps.

At the same time, there started to develop flexio-temporal means of encoding the distinction between completed and ongoing events. The development of aspectual tenses has decisively affected the majority of Indoeuropean (proto) languages. Indeed, in the majority of Indoeuropean (proto) languages, these flexio-temporal means *took over* the semantic functions of the Proto Indo-European opposition between aspectual themes, and matters have remained this way until the present day (think of contemporary French and its use of the *Imparfait* and *Passé Simple*).

However in Proto Slavic the aspectual tenses were just a temporary phenomenon: roughly, they developed in Late Proto Slavic, and in Old Polish they represented relics from the past. Moreover, aspectual tenses were never the only means of marking aspectual distinctions in (Proto) Slavic languages, and researchers generally argue that they never were the dominating aspectual system (see for instance Lehr-Splawiński and Bartula (1959) on Old Church Slavonic). This is because Proto Slavic retained many characteristic features of the Proto Indo-European verbal flexion, including the encoding of aspect by lexico-wordformational means. Researchers agree that as far as verbal flexion is concerned, Proto Slavic was the most conservative of the proto languages of the Indo-European family — indeed, that it practically represents a *continuation* of the Proto Indo-European verb system; see for instance Klemensiewicz et al. (1965), Rospond (1971), Długosz-Kurczabowa and Dubisz (2001). Nonetheless, for a certain period of time there co-existed two aspectual systems.

1.2.2 Aspect in Proto Slavic

Let us examine in more detail the (competing) aspectual systems of Proto Slavic. As we have just noted, Proto Slavic like other proto languages of the Indo-European family, was confronted with the reality of fading away of the difference between the two aspectual themes, and so with the growing difficulty of clearly expressing whether an event was completed or ongoing. Two ways of filling the aspectual gaps were on offer. One was to make use of the innovative aspectual tenses. The other was to keep what remained of the old Proto Indo-European lexico-wordformational means of encoding aspect, and try to hijack new wordformational means to cover the gaps. As we have said, the first, innovative way, was taken and consistently followed by most Indoeuropean proto languages. But Proto Slavic, although keen to explore this new way of expressing aspect, was essentially conservative: the flexio-temporal means of expressing aspect were a temporary innovation of Late Proto Slavic. During the period between Late Proto Slavic and Old Polish, aspectual tenses first lost their aspectual functions and then they disappeared. It were the lexico-wordformational means of encoding aspectual distinctions that established themselves in Polish. In what follows, we first discuss the lexico-wordformational system of aspect, and then we turn to the flexio-temporal aspectual system; we summarize the discussion by making some general remarks about the aspecto-temporal information expressed by Proto Slavic verbs.

The lexico-wordformational system of aspect

Due to its strong commitment to the mechanism of the Proto Indo-European aspectual system, Proto Slavic constantly ‘hijacked’ new wordformational means for aspectual purposes: that is, it reached for a wordformational morpheme and used it to cover a gap in the system of aspect. Let’s make this point more vivid. Suppose that Proto Slavic was confronted with a situation that there existed a verb expressing completion of a certain sort of event, but that there did not exist a verb expressing that the event of that sort was in progress. What did Proto Slavic do? In such a case, Proto Slavic reached for a word-formational morpheme and used it to derive an aspectual twin verb for the single (unpaired) verb. As a result of this twinning process, the two verbs (one basic and one derived from it by means of a hijacked wordformational morpheme), both referred to the same sort of event, but one of them (namely, the basic verb) expressed that that event was completed, and the other (namely, the derived verb) expressed that that event was ongoing. At some point, due to the — as researchers describe it, very intense and lively — process of aspectual pairing, enough verbs had an aspectual twin to push out the opposition between completed and non-completed tenses. Długosz-Kurczabowa and Dubisz say that an important reason for the disappearance of aspectual tenses in Slavic was that aspect had already been established in Proto Slavic as a category with lexico-wordformational-phonological carriers (Długosz-Kurczabowa and Dubisz, 2001, page 284).

That is, from a diachronic perspective the process of aspectual pairing lies at the heart of Slavic aspect, and we shall now introduce some ideas that will help us to

understand it better. We shall discuss the concept of aspectual pairs, and explain what it means for one member of an aspectual pair to be basic, and what it means for the other to be derived from it by means of an aspectual formant. We also discuss the idea of hijacking and give some examples of hijacked formants.

Aspectual pairs We might say that an aspectual pair is a pair of verbs, both of which can be used to describe the same sort of event, but of which one refers to the event of that sort as completed, and the other refers to it as ongoing.⁵

But doesn't this description of an aspectual pair mean that the Proto Indo-European verb system could be characterized as consisting of aspectual pairs? After all, we said that most verbs in Proto Indo-European came in two different aspectual themes. Nonetheless, if formal criteria are considered, we cannot talk of aspectual pairs in Proto Indo-European in quite the same way as in Slavic languages. Why not? Because in Proto Indo-European, the pairs of verbs minimally differing in aspect were both 'basic', in a sense in which (most) Slavic verbs forming aspectual pairs are not. That is, in Proto Indo-European, it was not the case that one member of such a pair was derived from the other. But in Slavic, the relation between the members of an aspectual pair crucially relies on the fact that one verb is basic (in the sense of word-formational, and not morphemic analysis, as we shall soon explain) and the other is derived from it by means of a formant (that is, a hijacked word-formational morpheme). In this sense one could say that one verb of a Slavic aspectual pair codes for aspect 'lexically', and the other expresses aspect by 'word-formational' means. But how did such kind of structure of a (Proto) Slavic aspectual pair develop from Proto Indo-European?

The sort of structure that characterizes a (Proto) Slavic aspectual pair seems to be the result of the fact that Proto Slavic inherited a verb system with aspectual gaps. The Proto Indo-European inheritance did not make all verbs available in the two (aspectual) flexion themes. So Proto Slavic hijacked word-formational means to reconstruct the verb that in Proto Indo-European was built by means of the contrasting flexion theme. But why did the reconstruction of aspectual counterpart verbs trigger off a whole re-structuring of the inherited system of aspect?

Proto Slavic created aspectual mates for single (unpaired) verbs by hijacking existing word-formational morphemes, and by creating new morphemes for the purpose of hijacking. For instance, if there existed a single (unpaired) verb referring to an ongoing event, a prefix was hijacked as a formant to derive a completed twin for that verb — clearly, the process of prefixation unambiguously marked which verb was basic, and which was derived from it. But the existing morphemes were not enough to meet the huge task of covering all the gaps, and new morphemes had to be created. New morphemes, in particular, suffixes, were extracted from existing verbs. As a result of this, the verbs from which a suffix was extracted became morphologically re-interpreted: that is, the originally basic verb was gradually re-analysed as derived. Let's explain this by means of an example. The suffix *-nq-* formed a flexion theme of

⁵This working definition doesn't cover perfective state verbs (these have inchoative readings) but it suffices for present purposes.

a certain conjugational class that for the most part consisted of verbs denoting completed events. These verbs had their ongoing correlatives in verbs containing *-a-* (and hence belonging to a different conjugational class). The suffix *-nq-* started to grow independent: already in Proto Slavic, it started to be used as a perfectivising formant outside of its own conjugational class. As a result of a growing productivity of the suffix *-nq-* (which later changed to *-nq-*), verbs containing it got re-interpreted as derived; and the corresponding verbs containing suffix *-a-* established themselves as basic.

Now that the distinction between the basic and the derived verb has come to play such an important role in our discussion, time is ripe to explain the notion of a ‘formant’, which makes all the difference.

Remarks on formants and morphemes We said that the concept of an aspectual pair, as we use it, crucially relies on the idea that one verb is basic and the other is derived from it by means of an aspectual formant. But we also saw that several word-formational means have been employed to derive aspectual twins. May we generalize over suffixisation and prefixisation as a mechanism of forming aspectual pairs? Or to put it another way: don’t we lose some important information when we ignore the differences between suffixes and prefixes, and simply call them both ‘formants’? No, we don’t think so. Abstracting away from whether suffixisation or prefixisation is used in deriving words is a fully justified strategy in morphological investigations. Moreover, as shall become clear in Chapter 4, where we investigate aspectual pairing in contemporary Polish, working at a higher level of formants enables us to see patterns of aspectual pairing.

There are two basic ways of thinking about the structure of words, and the two determine the distinction between what is traditionally called a ‘word-formational’ and a ‘morphematic’ analysis (Długosz-Kurczabowa and Dubisz, 2001, page 338), (Klemensiewicz et al., 1965, page 162), (Rospond, 1971, page 151f.); for more details see Puzynina (1977). While the word-formational analysis is concerned with the mechanism of deriving new words, the morphematic analysis is concerned with precisely analysing their structure.

A morphematic analysis decomposes a word into its smallest meaningful elements: that is, morphemes. A word-formational analysis, on the other hand, makes clear the *mechanism* of creating a word — which is thus always thought of as consisting of two components: a ‘theme’, or a ‘stem’ and a formant; (a ‘theme’ might well consist of a ‘root’ and a ‘theme-forming suffix’, but these two elements are not distinguished in the word-formational analysis). The two-element word-formational analysis relates to the idea of a two-element apperception, consisting of ‘genus proximum’ and ‘differentia specifica’. In word-formational analysis, it is a daily practice to speak of a ‘basic’ and a ‘derived’ verb, the derived verb being derived from the basic verb by means of a formant.

We will use the notion of formant in order to make clear the *mechanism* of aspectual pairing in Polish. We will speak of an aspectual pair as consisting of a basic and a complex verb, whereby the latter is derived from the former by means of an aspectual formant. An aspectual formant is a morpheme that is used to create an aspectual

pair — be it a prefix or a suffix. It is important to interpret our use of the term ‘basic verb’ within the context of the word-formational and not the morphematic analysis, for the verbs that we call basic can very well (and indeed often do) have a complex morphematic structure.

Now that the reader has some understanding of what a basic verb of an aspectual pair is (and thus what it means for aspect to be ‘lexically’ encoded) it is time to move to a more ambitious task: understanding how aspectual twins were created. We shall first explain what it means for a word-formational morpheme to be hijacked, and then we shall give some concrete examples of word-formational means hijacked for the purpose of aspectual pairing.

Hijacking The process of hijacking word-formational means for the purpose of deriving aspectual twins for unpaired verbs was an extremely important and productive process in Proto Slavic, and in contemporary Polish it still occurs when an aspectual twin is needed (we’ll see some nice examples in the last chapter when we consider some contemporary Polish computer terminology).

But what exactly do we mean when we say that a word-forming morpheme was “hijacked” for aspectual purposes? The idea behind this term is that a morpheme that is or was used for word-formational purposes becomes employed to derive an aspectual twin for a verb that lives alone.

Our metaphor of hijacking incorporates a basic observation from the study of morphology: namely, that a morpheme can be used for both word-formational (derivational) and grammatical (inflectional) purposes. Often, we only can judge in a particular context what function of a morpheme we are actually dealing with (Rospond, 1971, page 151f.). Hence, it seems more accurate to think of morphemes as being *used* for word-formational or grammatical purposes rather than *being* word-formational or grammatical morphemes. For instance, Klemensiewicz et al. list all verbal suffixes and prefixes from Old Polish and demonstrate how most of them have these two functions (Klemensiewicz et al., 1965, page 242-253). The same strategy is applied by Rospond, who discusses the different morphemes that have combined with verbs since the early stages of Slavic (Rospond, 1971, page 226f.). Rospond remarks that often it is hard — or indeed impossible — to distinguish a grammatical morpheme from a word-formational one due to the permanent interrelation between the historical development of both kinds of morphematic elements.

Aspectual formants Which morphemes were hijacked to be aspectual formants? As we said above, Proto Slavic hijacked prefixes and suffixes as formants. But we also remarked that some formants were already there, ready to be hijacked, but some others had to crystallise out first. Let us consider the employed formants in some more detail.

It seems that prefixes were (and are) particularly attractive means of aspectual pairing. Rospond notices that in Old Polish, prefixes were the most widely used class of affixes applied to verbs. He points out that the fundamental function of prefixes had an aspectual character:

‘In contrast to nouns, verbs do not have many suffixes at their disposal, but they are characterized by a rich prefixation. The fundamental function of prefixes is to express aspect — in particular, it expresses perfectivity (*napisać* ‘to write-perf’), or verbal sort, that is several modifications of the way the completed or non-completed action (state) took place (‘to swim’ — ‘to swim around’, ‘to swim off’, ‘to swim across’, etc.)’ (Rospond, 1971, page 229).

Długosz-Kurczabowa and Dubisz (2001) write that in Proto Slavic, the innovative use of prefixes for the purpose of marking aspectual distinctions, happened on a broad scale.

It should be noted that the Proto Slavic prefixal formants were not so strongly grammaticalized as they are in contemporary Polish. That is, the closeness between an aspectual prefix and the basic verb with which it combined was much looser than it is nowadays. There was a great deal of freedom in the application of prefixes: formally different prefixes did not necessarily induce semantic differences (perhaps one could say that there existed many ‘prefixal doublets’). Indeed, only in the last thirty years of the 19th century and at the beginning of the 20th century did a stabilization of the prefixation process take place: as Długosz-Kurczabowa and Dubisz (2001) put it, ‘prefixes became semantically (stylistically, or chronologically) specialized’ (Długosz-Kurczabowa and Dubisz, 2001, page 344). But in spite of this difference the fact remains that hijacking prefixes as aspectual formants was an important — maybe the most important — point in the history of Slavic aspect. It helped fix what we regard as the most fundamental fact about contemporary Polish aspectual pairs: namely that one member of the pair can be regarded as basic, and the other as derived from it by means of a formant.

But there were (and are) also suffixes employed to derive imperfective twins of perfective verbs. Where did they come from? In general, a great number of suffixal formants — among which, aspectual formants — developed in the process of morphological perintegration and absorption (Klemensiewicz et al., 1965, page 172), typically conditioned by the tendency to analogy. An important characteristic of the evolution of aspectual suffixes that started in Proto Slavic and continued for many centuries, was the striving for uniformity. The origin of suffixal aspectual formants can be traced back, more or less directly, to theme-forming morphemes of Proto Indo-European. Three suffixes should be mentioned as the most important and most productive among the suffixes that were hijacked for aspectual pairing: *-ja-*, *-va-*, *-nq-*.

The formant *-ja-* later developed into *-a-*. It was used to describe iterative and non-completed single events (Klemensiewicz et al., 1965, page 246). Rospond writes that the formant *-ja-* was one of the most productive carriers of iterativity, and it was accompanied by the extension of the root vowel (Rospond, 1971, page 228) (as the reader shall see in Chapter 4, in contemporary Polish the process of morphological change is often accompanied by changes in the root vowel). Lunt (1974) says that this suffix was a productive way of forming imperfective forms of verbs from different conjugational classes (Lunt, 1974, page 79). Some researchers call the formant *-ja-* a ‘durative theme suffix’ (Moszyński, 1984, page 266), (Długosz-Kurczabowa and

Dubisz, 2001, page 278). Interestingly, this suffix as part of the formant *bě-ja-x'* (that is, the sygmatic aorist form of the durative theme *bě-ja-*) became a part of the theme suffix *-ax-* that in Late Proto Slavic derived Imperfect tense forms. Later, it became more and more independent, and in 14th and 15th century Polish it was used more and more often with other verbs, by analogy (Lehr-Splawinski, 1951, page 174).

The formant *-va-* later developed into *-wa-*. It was even more clearly distinguished and more expansive than the formants *-ja-* and *-a-*. It also coded for iterated and ongoing events. It formed the basis for a couple of other formants that developed from it in the process of morphological perintegration and absorption — in particular, it formed the basis for the absorptive formants *-ava-* and *-yva-*, which later collapsed with *-ova-* (with its original structure *-ov-a-*) that was a theme of a certain conjugational class, and by analogy got directly hijacked for the purpose of imperfectivisation. Formant *-ywa-*, as the most expansive variant of *-wa-*, later started to push out its competitors. The descendants of *-wa-* got into close interaction with *-a-*.

The formant *-nq-* later developed into *-nq-*. Apart from its important word-formational functions (namely, forming a conjugational theme, and deriving verbs from nouns and adjectives), it expressed completed, and in particular, momentaneous events (Rospond, 1971, page 229), (Klemensiewicz et al., 1965, page 246), among others. This 'semelfactive' *-nq-* suffix is one of the four formants on which our classification is built.

Aspectual pairing Długosz-Kurczabowa and Dubisz (2001) write that in Proto Slavic the 'complete and incomplete wordformational shape of the verb was established' (Długosz-Kurczabowa and Dubisz, 2001, page 285). Lunt (1974) observes that the process of aspectual pairing was an important process marking Proto Slavic. He argues that the system of aspectual pairs permeated the whole verbal system of Old Church Slavonic (the language of the oldest Slavic manuscripts). Like Długosz-Kurczabowa and Dubisz (2001) for Polish, Lunt argues for Old Church Slavonic that the formation of aspectual pairs was an important 'part of the word-formation of verbal stems' (Lunt, 1974, page 74). Lunt writes:

The formation of new prefixed forms and of mates of the opposite aspect for various newly-created or already extant verbs must have been an active process in OCS as it is in all modern Slavic languages. It is certain that the suffix *-aj* (with or without modification of the root), and, to a lesser extent *-ova*, were productive for making imperfectives to various other classes of verbs, and it is probable that *-nq* was productive for making perfectives. Patterns of like formations could easily be extended. (Lunt, 1974, page 79)

Similarly, Dostál (1954) describes the Proto Slavic system of verbs. He argues that in order for the aspectual system, based on the opposition between completeness and non-completeness, to work, it is necessary to have available a pair of verbs for each lexical meaning. He argues that in order to meet this need, Proto Slavic used suffixes (in particular, the iterative suffixes) to imperfectivize perfective verbs, and different

prefixes to perfectivize imperfective verbs. He remarks that both processes were very lively.

Putting it all together Here is a list of the lexico-wordformational carriers of aspect used in Proto Slavic (Długosz-Kurczabowa and Dubisz, 2001, page 284).

- Aspectual ambivalence
Depending on the context, a given verb could express the meaning of perfectivity or imperfectivity, which can be interpreted as the result of fading away of the Proto Indo-European difference between two aspectual themes. Some examples of such Proto Slavic verbs are **iti* ‘to go’, **viděti* ‘to see’, **vitati* ‘to welcome’.⁶
- Homonymy of aspectual pairs
Similar in shape and cause to aspectual ambivalence. Some examples are: Proto Slavic imperfective **pomazati* - *pomazajǫ*, *pomazaješi* vs. perfective **pomazati* - *pomažǫ*, *pomažeši*.
- Suppletion of the suffixless themes
A result of Proto Indo-European aspectual differences in themes. Compare Proto Indo-European imperfective **Ees-* ‘to be’ vs. perfective **bhūH-* ‘to have become’; Proto Slavic imperfective **jes-* (present theme), **bě-* (past theme) vs. perfective **bǫd-* (present, future theme), **by-* (past theme).
- Differentiation of the theme suffixes
These suffixes extended the lexical morpheme and built a new form of the flexion theme. At the same time, they encoded the perfective and imperfective aspect. For instance, Proto Slavic imperfective **dvig-a-ti*, **sěd-a-ti* vs. perfective **dvig-nǫ-ti*, **sěd-ǫ-ti*.
- Vowel alternations in the roots of prefixed verbs
Examples: imperfective **prinositi* ‘to be bringing’ vs. perfective **prinesti* ‘to have brought’, imperfective **isceljati* vs. perfective *isceliti*.
- Suppletion of the roots of prefixed verbs
Example: imperfective **proxoditi* ‘to be coming’ vs. perfective **proiti* ‘to have come’.
- Aspect-forming prefixes
They introduce the meaning component of completion. Examples are: imperfective **xvaliti* ‘to be praising’ vs. perfective **poxvaliti* ‘to have praised’, **pisati* ‘to be writing’ vs. perfective **napisati* ‘to have written’, **dělati* ‘to be doing, making’ vs. perfective **s’dělati* ‘to have done, made’, **lubiti* ‘to like, love’ vs. perfective **v’zľubiti* ‘to have started to like, love’.

⁶The asterisk (**) is used to mark the reconstructed verbs.

Długosz-Kurczabowa and Dubisz (2001) write that the majority of the lexico-wordformational carriers of aspect just listed were simply inherited from Proto Indo-European; ‘aspect-forming prefixes’ form the only genuinely innovative part of the list. Let’s spell this out a little. The ‘suppletion of the suffixless themes’ and the ‘suppletion of the roots of prefixed verbs’ is a direct Proto Indo-European inheritance. The ‘aspectual ambivalence’ and the ‘homonymy of aspectual pairs’ are the result of fading away of the Proto Indo-European opposition between aspectual themes. The origin of the ‘differentiation of the theme-suffixes’ and the ‘vowel alternations in the roots of prefixed verbs’ can be traced back to the Proto Indo-European differences in aspectual themes.

So in Proto Slavic, the development of the suffixal aspectual formants has commenced, and would continue for many centuries. The hijacking of prefixes was quite a success — but still, just an innovation; so time had to pass before prefixes could get fully assimilated as aspectual formants.

On the other hand, the effects of fading away of the Proto Indo-European thematic differences (such as aspectual ambivalence, homonymy, or suppletivism) must have been rather unpleasant. The need to cover all the gaps in the aspectual system was pressing. And as we have already remarked, an alternative was simultaneously being explored: the use of aspectual tenses. Although this method was ultimately to be wiped out by the success of aspectual pairing, for a while it was an interesting alternative. Let’s take a closer look.

The flexio-temporal system of aspect

The urgent need to express whether an event was completed or ongoing induced Late Proto Slavic to try out the innovative aspectual tenses. The tenses offered themselves as a fresh and user-friendly means of encoding aspectual opposition: in contrast to lexico-wordformational means of expressing aspect, which were still not fully grammaticalized, the flexio-temporal means could be used with all verbs in a uniform way. Moreover, reaching for tenses was a natural and promising move in the light of the beginning of a gradual change in the morphological structure of the Late Proto Slavic verb. As we said, in Late Proto Slavic, there occurred a tendency to change the three-component morphological structure of the Proto Indo-European verb (consisting of the root, the theme-forming suffix, and the flexion ending) into a two-component structure (consisting of the root possibly extended with a theme-forming suffix, and the flexion ending). A flexio-temporal aspectual marker was an easy-to-handle marker: it simply needed to be added to the theme (that is, roughly, to that part of word that remains after the ending is removed).

We shall now describe two simple tenses: the Aorist(s) and the Imperfectum, and two compound tenses: the Perfectum and the Plusquamperfectum. Researchers agree that the Imperfectum was used to describe states and actions that hold (singly or iterated) and that the Aorist was used to describe single completed actions. But there is disagreement as to the semantics of the compound tenses. A great majority of researchers refer to the compound tenses as ‘Perfectum’ and ‘Plusquamperfectum’, and

describe these tenses as referring to the events that took place in the past but whose results are relevant at the time of reference; see for instance Klemensiewicz et al. (1965). A few researchers believe that it is incorrect to characterize the two compound tenses in terms of the semantic element of ‘resultativity’, and they argue that it is incorrect to refer to these tenses as ‘Perfectum’ and ‘Plusquamperfectum’; see for instance Słoński (1953). We shall join the majority of researchers and speak of Perfectum and Plusquamperfectum.

The tenses did not all occur at the same time. The first tense form was the Aorist, and originally it did not have aspectual functions. Due to the development of other tenses, which expressed aspectual meanings, the Aorist assumed its secondary aspectual function.

Aorist The Aorist was the elementary past tense in Proto Slavic. It was inherited from Proto Indo-European. But it should be emphasized that in Proto Indo-European, as well as originally in Proto Slavic, this tense merely located the event in the past with respect to the moment of speech, and it did not express aspectual distinctions. Only in Late Proto Slavic did the Aorist start to assume a secondary semantico-aspectual function. That is, in Late Proto Slavic, the center of gravity of this tense form shifted from the general function of denoting a past event to denoting an event that is momentaneous and completed, and hence belongs to the past. This change was triggered by the emergence of Imperfectum, Perfectum and Plusquamperfectum.

In total, Slavic knew three forms of the Aorist: two forms were primary and the third one developed by merging the two primary ones. The two primary aoristic forms were the ‘Sygmatic Aorist I’ and the ‘Asygmatic Aorist’. These two forms had a different distribution across the conjugational classes of verbs (for the description of the conjugational classes see for instance (Długosz-Kurczabowa and Dubisz, 2001, page 272)). Roughly speaking, the use of the Sygmatic Aorist I was very broad: it was used in four of the five conjugational classes. It was formed by adding to the infinitival theme the theme suffix *-s-* (hence the name of this aorist form) that in certain positions became *-x-*. The Asygmatic Aorist was formed from the present tense themes ending with *-o/-e-*; that is, it was formed from verbs belonging to one single conjugational class (namely, conjugation I). The third form of the Aorist, the ‘Sygmatic Aorist II’ developed in Late Proto Slavic as a secondary form, formed on the basis of the two earlier aoristic forms. It was formed from the infinitival theme by adding to it the complex thematic suffix *o-x-*. Roughly, the range of the Sygmatic Aorist II was limited to the verbs that had the Asygmatic Aorist. For more details see (Długosz-Kurczabowa and Dubisz, 2001, page 276-277).

Imperfectum The primary function of the Imperfectum was to describe a durative (that is, long lasting or repetitive) event that was not completed. Only secondarily was the Imperfectum used to denote a past event. This secondary function might follow from the aoristic origin of the Imperfectum (Długosz-Kurczabowa and Dubisz, 2001, page 278). The Imperfectum was expressed by the theme suffix *-ax-*. The origins of this suffix are not completely clear. Perhaps it was abstracted from the formant *bě-ja-*

x' on the basis of the opposition $běx-bějax'$. The form $bě-ja-x' \rightarrow běx'$ was the original Sygmatic Aorist of the durative theme $bě-ja-$; $bě-ja-$ arose as a result of extending the imperfective root $bě-$ with the durative theme suffix $-ja-$.

Compound Past Tenses: Perfectum and Plusquamperfectum The two complex forms of the past tense must have existed already in Late Proto Slavic, since they are attested in Old Church Slavonic (that is, the earliest documented form of Slavic). However, on the basis of functional considerations it can be assumed that the Perfectum and Plusquamperfectum developed after the aspecto-temporal functions of the Imperfectum and Aorist had been established (in particular, the aspectual complementarity of the Imperfectum/Aorist opposition). Both Perfect and Plusquamperfect were used to denote events that happened before the moment at which that event was regarded, but whose results still existed at that particular moment. In the case of the Perfectum, the point of reference was the the present moment, and in the case of the Plusquamperfectum, it was a certain time in the past. The Perfectum was formed from the active past participle II and the auxiliary *byti* 'to be' in the present tense form. Plusquamperfectum was formed from the active past participle II and the auxiliary *byti* 'to be' in the past tense form (either aorist or imperfectum).

Verbs in Proto Slavic

As a summary of our presentation of the Proto Slavic verb system, a few rather general remarks reflecting the way the historical linguists perceive the aspecto-temporal information encoded in the Proto Slavic verb.

Researchers investigating the evolution of the Slavic languages generally agree that the earliest and the contemporary Slavic verbs express two kinds of temporal information: localization of the event with respect to the speech time, and the information about the temporal constituency of the event itself. The first kind of information is contributed by 'tense'. Tense is standardly explained as pointing to future or past, as regarded from the speech time; present tense expresses that an event is simultaneous with the speech time, or is a universal 'truth'. The second kind of information is called 'aspect'. Historical linguists generally agree in analysing the opposition between the 'complete' (that is, perfective) and the 'incomplete' (that is, imperfective) aspect as describing an inherent property of the event referred to by the verb. They often say that the 'reference point' for aspect is not, as it is for tense, the moment of speech, but the moment of the completion of the event (Rospond, 1971, page 305); or, that the 'reference point' for aspect is the temporal border (that is, the beginning or the end) of the event (for instance, Klemensiewicz et al. (1965)). They like saying that the perfective aspect expresses that we look at the event from the moment of its completion, and hence we perceive it as something that happened in the past. By contrast, the imperfective aspect expresses that we consider the event before it was completed, and hence we perceive it as something that is happening at the present moment.

Historical linguists generally agree that in contrast to tense, aspect expresses an inherent property of the denoted event. Hence they agree that aspect is a verbal pro-

perty, which may be expressed lexically or by wordformational means. See for instance Leskien (1962), Słoński (1953), Dostál (1954), Lehr-Spławiński and Bartula (1959), Kuryłowicz (1964), Klemensiewicz et al. (1965), Vaillant (1966), Rospond (1971), Lunt (1974), Stieber (1979), Kuraszkiewicz (1981), and Długosz-Kurczabowa and Dubisz (2001), among others.

As an illustration of this point of view, consider the following quotation from Lehr-Spławiński and Bartula (1959).

W języku scs. — jak w innych językach słow. — formy czasownikowe wyrażają nie tylko czas w stosunku do chwili, w której mówimy (teraźniejszy, przeszły, przyszły), ale także przebieg czynności czy stanu w stosunku do czasu w ogóle (czynność dokonana lub niedokonana). Ten drugi moment znaczeniowy nie jest w językach słowiańskich — w przeciwieństwie do przeważnej części języków indoeuropejskich (por. np. język grecki lub łaciński) — związany z formą czasu (prae., imper., perf., aor., fut., fut. exact.), ale tkwi w poszczególnych czasownikach i w bardzo ograniczonej tylko mierze bywa modyfikowany przez formy czasowe (np. aor. dla wyrażenia czynności momentalnej, imperf. dla wyrażenia czynności długotrwałej). Ze względu na przebieg czynności (actio) dzielimy czasowniki scs. na: 1) słowa niedokonane (imperfectiva), wśród których odróżnić trzeba słowa oznaczające czynność trwałą (durativa) od słów wyrażających czynność powtarzającą się (iterativa, częstotliwie) i 2) słowa dokonane (perfectiva). (Lehr-Spławiński and Bartula, 1959, page 65)

[In Old Church Slavonic — as in other Slavic languages — verbal forms do not only express time with respect to the speech time (past, present, future), but also the course of an action or state with respect to time in general (a completed or non-completed action). This second meaning component is in Slavic languages — in contrast to the majority of Indo-European languages (compare for instance Greek or Latin) — not connected to the tense form (presens, imperfectum, perfectum, aorist, futurum, futurum exactum), but is inherent in particular verbs and can only to a very limited extent be modified by tense forms (for instance, aorist in order to express a momentaneous action, imperfectum in order to express a long lasting action). With respect to the course of the action (actio) we divide Old Church Slavonic verbs into: 1) non-completed words (imperfectiva), among which one has to distinguish words denoting a durative action (durativa) from words expressing a repetitive action (iterativa, frequentativa) and 2) completed words (perfectiva).]

Lehr-Spławiński and Bartula (1959) continue by describing which conjugational classes consisted of imperfective and which of perfective verbs. They observe that the imperfective verbs when combined with prefixes became perfective.

1.2.3 Aspect in Old Polish

In the period immediately preceding Old Polish, two important changes took place, which determined the shape of the aspectual system of contemporary Polish: first, the disappearance of the Aorist/Imperfectum distinction; second, the expansion of the Perfectum. Both processes were closely connected to each other, and they were triggered by the ongoing wordformational process of aspectual pairing.

Researchers agree that the system of the past tenses was already considerably simplified in Old Polish, when compared to Late Proto Slavic. In the Old Polish texts, the verbal forms in Aorist and Imperfectum are relics of the past: there are only 26 forms attested of which we can be sure that they really are examples of the Aorist and the Imperfectum; additionally, there are four doubtful cases. Moreover, as far as the Aorist is concerned, only the form of the Sygmatic Aorist II (that is, the late form of the Aorist) is attested. The formal and the semantic opposition between Aorist and Imperfectum (that is, the opposition between the complete and incomplete tenses) has already partly faded away in Old Polish.

Researchers argue that the reason for the disappearance of aspectual tenses was that the category of aspect had in the meantime obtained enough wordformational carriers, and had established itself as a system of aspectual pairs. However, the Perfectum did not disappear from the language — as we said, it was expanding (and indeed it established itself as the only past tense form in Polish). Nonetheless, it has lost its aspectual function of denoting an event whose results are relevant at the point of speech.

The Perfectum was used with complete and incomplete verbs, and it were the verbs that encoded aspectual meaning — the Perfectum merely located the denoted events in the past. The use of Perfectum with complete and incomplete verbs was expanding, and made the distinction between Aorist and Imperfectum more and more redundant. Finally, Perfectum pushed out the intransparent Aorist/Imperfectum distinction: Perfectum of complete verbs took over the aspectual functions of the Aorist, and Perfectum of incomplete verbs took over the aspectual functions of the Imperfectum. As Klemensiewicz et al. put it:

Ważną przyczyną ówczesnego zaniku imperfektu i aorystu był rozwój uzupełniających się wzajemnie systemów czasownika o tym samym znaczeniu realnym, a przeciwstawiających się sobie aspektem niedokonanym i dokonanym. Różnicę, wyrażoną dawniej przez opozycję imperfektu, który mówi o czynności trwającej w przeszłości, i aorystu, który mówi o czynności jednokrotnej, w przeszłości skończonej, zaczyna wyrażać jedna złożona forma czasu przeszłego, tak że imperfekt zostaje zastąpiony przez złożoną formę czasu przeszłego słów niedokonanych, aoryst zaś przez złożoną formę czasu przeszłego słów dokonanych. (Klemensiewicz et al., 1965, pages 370ff.)

[An important reason for the disappearance of the imperfect and the aorist in that time was the development of complementary verbal systems with the same real meaning, but contrasting imperfective and perfective aspect. The difference that was earlier expressed by the opposition of the imper-

fect, which talks of an action that lasts in the past, and the aorist, which talks of a single action finished in the past, now starts to be expressed by one complex form of the past tense, so that the imperfect gets replaced by the complex form of the past tense of imperfective words, and the aorist, on the other hand, by the complex past tense form of perfective words.]

Or to quote Kuraszekiewicz:

Außer dem zusammengesetzten Prät. ererbte die poln. Sprache zwei andere Tempora der Vergangenheit: den sog. Aorist, der ein perfektives Präteritaltempus zum Ausdruck brachte, und das Imperfect als imperfectives Präteritaltempus. Im Poln. wurde die Erscheinung des Verbalaspekts, d.h. die Unterscheidung eines pf. und ipf. Tätigkeitsverlaufes, später nicht mehr durch Tempora (Aorist — Imperfekt) zum Ausdruck gebracht; sie wurde vielmehr eine Kategorie des Wortes und der Wortbildung, ausgedrückt durch Wurzel, Suffixe und Präfixe. Aus diesem Grunde begannen die Formen von Aorist und Imperfekt sich frühzeitig zu vermischen und kamen allmählich aus dem Gebrauch. Es blieb und entwickelte sich nur das zusammengesetzte Prät., das sowohl von pf. wie ipf. Verben gebildet wurde. (Kuraszekiewicz, 1981, page 131)

In fact, the contemporary Polish aspecto-temporal system remains in essence unchanged from this period. That is, the contemporary past perfective verbs are actually Perfectum forms of complete verbs, and the contemporary past imperfective verbs are actually Perfectum forms of incomplete verbs. With a layman's eye this can be hard to see, since the contemporary Polish past tense forms are *contracted* forms of the original Perfectum. But the facts are clear. Until the 15th/16th century, both full and contracted versions of the auxiliary can be found. Then in the 17th and 18th century Polish the auxiliary finally became a clitic. And this synthetic form is the only past tense form of contemporary Polish (Długosz-Kurczabowa and Dubisz, 2001, page 305-310), (Klemensiewicz et al., 1965, pages 370ff.), among others.

1.2.4 Aspect in Middle and New Polish

The evolution of the aspectual system since Proto Slavic can be characterized in terms of crystallisation of aspect as an independent system of language (in particular, independent from the tense system). This process was driven by the need to clearly mark the distinction between completed and ongoing events. It expressed itself by striving to create a full system of aspectual pairs. This striving is formally reflected by the striving to uniformity of aspectual formants. The striving to uniformity of aspectual formants is connected to the process of grammaticalization of these formants. The striving to uniformity of formants is visible within the domain of suffixal and prefixal formants — but in slightly different ways. The origin of suffixal formants can be traced back to Proto Indo-European themes, but the prefixal formants are, as we said, an innovation of Proto Slavic. The process of grammaticalization of suffixes

is nowadays more advanced than the process of grammaticalization of prefixes. The grammaticalisation of prefixes encounters additional obstacles, which do not arise for suffixes. In particular, most verbal prefixes used as aspectual formants have (or had) formal counterparts among the prepositions, and can (or could) be associated with them; suffixes, on the other hand, are not associated with any independent words.

Let us now briefly describe the evolution of the most important suffixal formants used in the process of aspectual pairing in contemporary Polish. The morphological literature describes the main aspectual suffixal formants of contemporary Polish as being used for two major purposes. The first function is word-formational: they form conjugational bases — that is, the so-called themes of verbs (Polish has two: the present and the past tense theme), and some of them derive new verbs from adjectives or nouns. The second function is aspectual: they derive aspectual twins. We base the following presentation of the development of contemporary Polish suffixes on Klemensiewicz et al. (1965), but use some insights of Lehr-Splawiński and Bartula (1959), Rospond (1971), Kuraszkiewicz (1981), Długosz-Kurczabowa and Dubisz (2001), and others.

- Formant *-’a-* that developed from **-ja-*

It has a word-forming function of building a basic conjugational form, namely a past tense theme — for instance, contemporary Polish *ogłasz-a-t* ‘(he) announced-impf’, *oczyszcz-a-t* ‘(he) cleaned-impf’; Old Church Slavonic *oglaš-a-(l’)* ‘(he) announced-impf’, *očišt-a-(l’)* ‘(he) cleaned-impf’.

This formant contributes the meaning of incompleteness and iteration, if it occurs in opposition to the formant *-i-*, which occurs in verbs referring to completed and single-time events — for instance, contemporary Polish *ogłasz-a-ć* ‘to announce-impf’ vs. *ogłos-i-ć* ‘to announce-pf’, *oczyszcz-a-ć* ‘to clean-impf’ vs. *oczyśc-i-ć* ‘to clean-pf’; Old Church Slavonic *oglaš-a-ti* ‘to announce-impf’ vs. *oglas-i-ti* ‘to announce-pf’, *očišt-a-ti* ‘to clean-impf’ vs. *očist-i-ti* ‘to clean-pf’.

- Formant *-’e//’a-* that developed from **-ě-*

It has a word-forming function of building a basic conjugational form, namely a past tense theme — for instance, contemporary Polish *krzycz-a-t* ‘(he) shouted-impf’, *dźwig-a-t* ‘(he) moved/carried-impf’; Old Church Slavonic *krič-a-(l’)* ‘(he) shouted-impf’, *dvig-a-(l’)* ‘(he) moved/carried-impf’. Moreover, this formant can derive state verbs from nouns and adjectives — for instance, contemporary Polish *kamieni-a-t* ‘(he) became-impf stonelike’, *mądrz-a-t* ‘(he) became-impf wise’.

Finally, in opposition to formant *-na-*, it can emphasise incompleteness. For instance, contemporary Polish *krzycz-e-ć* ‘to shout-impf’ vs. *krzyk-na-ć* ‘to shout-pf’, *dźwig-a-ć* ‘to move/carry-impf’ vs. *dźwig-na-ć* ‘to move/carry-pf’; Old Church Slavonic *krič-a-ti* ‘to shout-impf’ vs. *krik-na-ti* ‘to shout-pf’, *dvig-a-ti* ‘to move/carry-impf’ vs. *dvig-na-ti* ‘to move/carry-pf’.

- Formant *-wa-* that developed from * *-va-*

Its word-forming function is forming an important conjugational basis of the present and past tense themes. For instance, *da-wa-ł* ‘(he) gave-impf’, *ukry-wa-ł* ‘(he) hid-impf’.

It emphasizes the meaning of incompleteness, and sometimes iterativity (the reader should recall, that according to some writers, this suffix was primarily used to derive iterative verbs (Lehr-Splawinski, 1951, page 174)). For instance, contemporary Polish *dać* ‘to give-pf’ vs. *dawać* ‘to give-impf’, Old Polish *dati* ‘to give-pf’ vs. *davati* ‘to give-impf’; contemporary Polish *podać* ‘to pass-pf (something to somebody)’ vs. *podawać* ‘to pass-impf (something to somebody)’, Old Church Slavonic *podati* ‘to pass-pf (something to somebody)’ vs. *podavati* ‘to pass-impf (something to somebody)’.

This formant was extremely expansive. It forms the basis of a couple of other formants that developed from it in the process of morphological perintegration and absorption.

For instance, it forms the basis for the absorptive formants *-ava-* and *-yva-*, which later collapsed with *-ova-*. Formant *-awa-* was extracted from *wygra-wa-ć* ‘to win-impf’, in which *a-* became disconnected from the root *wygr-awa-ć* ‘to win-impf’. This formant was later replaced by the absorbed *-ywa-*: *wygr-ywa-ć* ‘to win-impf’. Formant *-ywa-* established itself in Polish as the most expansive variant of *-wa-*, and we shall soon come back to it.

Formants *-ava-* and *-yva-*, two absorptive variants of *-wa-*, after collapsing with *-owa-* very often pushed out original verbs which did not have such a formant. For instance, in an old stadium, there was *grześć* ‘to dig-impf’ and *wygrześć* ‘to dig out-pf’ vs. *wygrzebać* ‘to dig out-impf’. In the new stadium, there is *grzebać* ‘to dig-impf’, and *wygrzebać* ‘to dig out-pf’ vs. *wygrzebawać/wygrzebować/wygrzebywać* ‘to dig out-impf’ (these are dialectal variants of each other).

- Formant *-ywa-/-iwa-*

This formant developed in Polish by extraction from verbs such as *ukrywać* ‘to hide-impf’, where *-y-* belonged to the root. It is thus a perfect example of morphological perintegration (*ukry-wa-ć* ‘to hide-impf’ becomes re-analysed as *ukr-ywa-ć* ‘to hide-impf’) and absorption (*-y-* belonged to the root, but is in the process of morphological perintegration absorbed by the suffix). In contemporary Polish, it occurs in past and present tense theme and expresses incompleteness and iterativity. Moreover, since the 17th century, this formant has a word-formational function of building the past tense theme of many verbs which in Middle and Old Polish contained *-ow-a-* or *-aw-a-* — for instance, the old *pokazować* ‘to show-impf’ became replaced by *pokazywać* ‘to show-impf’; (*pokazywać* ‘to show-impf’ was Mazowian variant of *pokazować* ‘to show-impf’, which still is used in dialects of South-West Poland).

- Formant *-ow-* that developed from * *-ov-*

If combined with formant *-a-*, it plays an important word-forming function of creating the past tense theme — for instance, *kup-ow-a-ł* ‘(he) bought-impf’ *mił-ow-a-ł* ‘(he) loved-impf’. At the same time, it derives verbs (very often, state verbs) from nouns or adjectives — for instance, *mił-ow-a-ł* ‘(he) loved-impf’ (derived from *miłość* ‘love’), *chor-ow-a-ł* ‘(he) was sick-impf’ (derived from *choroba* ‘sickness’).

In opposition to *-i-*, it expresses the meaning of completion.

In Old and Middle Polish, it occurred in verbs which later replaced it by *-ywa-* or *-a-*.

- Formant *-nq-/-nq-* that developed from * *-nq-*

It has a word-forming function of building a basic conjugational form, namely past tense theme — for instance, contemporary Polish *krzyk-nq-ł* ‘(he) shouted-pf’, *dźwig-nq-ł* ‘(he) moved/moved-pf’; Old Church Slavonic *krik-nq-(l’)* ‘(he) shouted-pf’, *dvig-nq-(l’)* ‘(he) moved/moved-pf’. Moreover, this formant can derive state verbs from adjectives — for instance, contemporary Polish *chud-nq-ł* ‘to become skinny-impf’ (derived from *chudy* ‘skinny’), *grub-nq-ł* ‘to become fat-impf’ (derived from *gruby* ‘fat’).

Finally, in opposition with formant *-a-*, it can have the meaning of completion—and in particular, it can emphasise momentaneity of an event or state. For instance, contemporary Polish *krzycz-e-ć* ‘to shout-impf’ vs. *krzyk-nq-ć* ‘to shout-pf’, *dźwig-a-ć* ‘to move/carry-impf’ vs. *dźwig-nq-ć* ‘to move/carry-pf’; Old Church Slavonic *krič-a-ti* ‘to shout-impf’ vs. *krik-nq-ti* ‘to shout-pf’, *dvig-a-ti* ‘to move/carry-impf’ vs. *dvig-nq-ti* ‘to move/carry-pf’.

Let us sum matters up from the perspective of the contemporary Polish system of aspectual pairing, and let us also take a brief look at the prefixes.

In the aspectology of new and contemporary Polish, researchers typically talk of ‘the imperfectivising suffix *-y/iwa-*’, and the perfectivising suffix *-nq-* (most people call it the ‘semelfactive’ suffix). But as we’ve seen, the cristallisation of *-y/iwa-* has a long history — a history whose traces are still visible in the complexity of the contemporary process of imperfectivisation, that we shall discuss in detail in Chapter 4 under the name ‘morphological change’. The term ‘morphological change’ (borrowed from Czochralski (1975)) indicates that the process of imperfectivisation in contemporary Polish is not completely uniform, and can involve morphological and phonological changes — that is, it involves imperfectivisation by the formant *-y/iwa-*, as well as the formant *-a-*, which are often accompanied by vowel changes in the root.

The formant *-y/iwa-*, as well as the formant *-awa-*, both developed in the process of morphological perintegration and absorption from *-wa-* (which developed from the Proto Slavic **-va*); the *-wa-* expressed the meaning of incompleteness and iteration, and was extremely expansive. By analogy to these two absorptive formants, the theme-suffix of a certain conjugational class, namely *-ova-*, was hijacked for the aspectual

purpose of imperfectivisation. These three formants got mixed up. Since the 17th century the formant *-y/iwa-* has been replacing its competitors.

The formant *-a-* expressed the meaning of iteration and incompleteness. It could originate from the theme-morphemes of three different conjugational classes: from a very productive Proto Slavic suffix **-ja-*, which was often accompanied by vowel changes in the root, from the Proto Slavic **-a-*, and from the Proto Slavic **-ě-*. The formant *-a-* which developed from **-ě-* made part of the theme of an imperfective counterpart of a perfective verb containing **-nq-/-nq-*, and it seems that it was not hijacked for imperfectivising purposes (rather, it is the theme suffix **-nq-/-nq-* of its perfective counterpart that was hijacked as a perfectivising formant). The formant *-a-* which developed from **-a-* or **-ja-*, was hijacked to imperfectivise perfective verbs. Recall that the Proto Slavic **-ja-*, which was part of the formant *bě-ja-x?* (that is, the Sygmatic Aorist form of the durative theme *bě-ja-*), later became a part of the theme suffix *-ax-* that derived Imperfect tense forms. In later periods, it was getting more and more independent, and in the 14th and 15th century, it was increasingly used with other verbs, by analogy (Lehr-Splawiński, 1951, page 174).

The imperfectivising formant *-a-* has been interacting with the formant *-wa-*, and its descendants. Both formants were extremely expansive, and it seems that their expansiveness still grows. The methodological practice of aspectologists might seem to suggest that the imperfectivising formant *-y/iwa-* is collapsing with the imperfectivising formant *-a-*: as we said, most researchers on aspect simply talk of imperfectivisation by the suffix *-ywa-*, and view *-a-* as a variant of *-ywa-*.⁷ Yet, matters can be much more subtle than that. In Chapter 2 we shall see that some writers (notably Isačenko (1962)) argue that very often it is simply impossible to determine the real status of the formant *-a-* on the basis of synchronical analysis — or even worse, that a synchronical analysis can make incorrect predictions about the real status of the *-a-*. To put it in a very simple way: the formant *-a-* in a contemporary verb may very well originate from the suffixal formant *-a-* (which developed from a theme-forming suffix *-ja-* or *-a-*) — but it need not.

However, the situation is different with perfectivisation by *-nq-*. This suffix has essentially the same shape as it used to have in Proto Slavic, when it primarily functioned as a theme forming suffix of a certain conjugational class. Since this suffix got hijacked for aspectual pairing, its productivity has been growing. This suffix seems to be particularly expansive in contemporary Polish, as we shall discuss in the final chapter of this thesis.

Let us now consider the prefixes. In contemporary aspectology we talk of ‘empty prefixes’ as a means of deriving perfective counterparts of imperfective verbs. We said before that hijacking prefixes for the aspectual pairing process was an innovation of

⁷Interestingly, a comparative study of imperfectivisation in different Slavic languages, as well as dialects of a given Slavic language, seems to support the intuition that might stand behind the methodological approach of the contemporary aspectologists. For example, consider the Polish verb *skupić* ‘to buy (back)/to concentrate-perf’. This verb gets imperfectivised by the suffixal formant *-owa-*: *skupować* ‘to buy (back)/to concentrate-impf’. However, *skupit’* ‘to buy plenty-perf’, the Russian (formal, though not semantical) correspondent of the Polish perfective verb, gets imperfectivised by the formant *-a-*: *skupat’* ‘to buy plenty-impf’.

Proto Slavic, and researchers write that it happened on a broad scale. Yet, as we indicated, the picture that we get of prefixal formations in Proto Slavic is quite different from the picture that we get nowadays.

Roughly, in Proto Slavic, a verb could be perfectivised by formally different prefixes, and the relation between the basic verb and the prefix was much looser than it is today; we could describe this state of affairs by saying that in Proto Slavic there were many ‘prefixal doublets’. This has been changing in the course of the evolution of aspect system. The crucial development consists in crystallisation for each verb of a specific prefix that derives a perfective twin. This prefix is called the ‘empty prefix’, since it is thought of as being emptied from its lexical meaning in the grammaticalization process. In contemporary Polish, virtually all verbs selecting for an empty prefix combine with a unique empty prefix; the few remaining prefixal doublets are exceptions. Nonetheless, no single empty prefix that would universally apply to all imperfective verbs has developed — instead, formally different prefixes can function as empty prefixes with particular verbs. Among the prefixes used as empty, one prefix is used most often: the prefix *z(a)-*. It is hard to ascribe any semantic content to this prefix, and writers do not agree on what this prefix actually means (Bogusławski, 1963, page 105).

It is interesting to speculate that Slavic could have developed in a different way — for instance, perhaps it could have developed in a way similar to its closest neighbor, the Baltic family. In Lithuanian, a semantically empty prefix developed that uniformly applies to all imperfective verbs: “In Lithuanian it is possible to derive the Perfective counterpart to any Imperfective verb by the prefix *pa-* (semantically bleached)” (Hewson and Bubenik, 1997, page 84).

1.2.5 Summary

We have studied the evolution of the Polish aspecto-temporal system, and in particular, we have investigated how the Polish system of aspectual pairs developed from the Proto Indo-European. The evolution of the aspectual system sheds light on the nature of aspectual pairs, as we encounter them in contemporary Polish. In particular, it makes it understandable from the diachronical perspective why it is that one verb of a pair is basic and the other is derived (or, to put it another way, why aspect encoded ‘lexically’ can be altered by wordformational means). Our discussion also helps to explain the mechanism of aspectual pairing. For instance, it shows how the formants that are used for the purpose of aspectual pairing in contemporary Polish established themselves in the course of the language development. In Chapter 4 we shall introduce a classification that captures the mechanism of aspectual pairing in contemporary Polish. The discussion of this section shows that the classification to be introduced in Chapter 4 has a diachronical motivation.

However, this thesis is a synchronical one, and it’s time to close the diachronical discussion, and move on. In the next section we shall present an overview of the thesis in order for the reader to see what he can expect to find in the chapters that follow.

1.3 Overview of the thesis

Our little Polish lesson completed, we are ready for a chapter-by-chapter overview of the work that follows.

Chapter 2. Aspect and Aktionsart: some History. As we have seen, Slavic aspect is a controversial topic. And as we shall learn in this chapter, this is hardly surprising: the most basic concepts (such as ‘aspect’ and ‘Aktionsart’) emerged over a lengthy period as a result of a complex interaction between the Germanic and Slavic linguistic traditions. In this chapter we sketch this story, paying particular attention to its effects on the Slavic aspectual research tradition.

Chapter 3. Parallelism-Based Approaches. One of the most influential lines of research in recent Western work on aspect are what we call parallelism-based approaches. The characteristic feature of these approaches is the heavy emphasis they place on the role of the level of verb phrase in aspectuality. In this chapter we trace the origins of the idea, and then examine their relevance to contemporary Polish.

Chapter 4. An Aspectual Classification of Polish Verbs. With our historical and critical work behind us, we turn to the main positive contribution of the thesis: an aspectual classification of Polish verbs. We introduce the four formants we shall use, define the secondary imperfectivisation test (and its mirror image, the secondary perfectivisation test), and then present the classification in two ways: as a table, and as a simple Prolog program. Following this we (informally) discuss the semantic distinctions the classification induces, and consider whether the classification can be extended.

Chapter 5. A Closer Look at the Classification. In this chapter we subject our verb classification to closer scrutiny. We map the limits of its coverage, argue that its use of empty prefixes does not constitute a reason for its rejection on theoretical grounds, and formalize the semantic distinctions it supports. We then spell out what we believe it contributes to the Western and Slavic aspectual research traditions, and sketch directions for future research.

Chapter 2

Aspect and Aktionsart: some History

In the previous chapter we introduced some of the basic concepts of aspect in Polish (verb pairs, binary oppositions, suffixisation, prefixisation, and so on) and discussed how the Polish aspectual system evolved. But we are not yet ready to present the positive contribution of this thesis (that must wait until Chapters 4 and 5) as a more pressing task faces us: developing a deeper understanding of the research agendas underlying the study of aspect and Aktionsart. This is a particularly pressing one for this thesis, for the work described here needs to be located not within one research tradition but two.

The study of aspect and Aktionsart has a long history. Nearly two centuries ago, a general concept of aspect was distinguished from tense, and 75 years later this concept was subdivided into something like the modern (narrow) concept of aspect plus the broader category of Aktionsart. This process did not occur within a single research community — it happened as a result of the interactions between two communities facing very different problems, namely Slavic linguists (dealing with morphologically rich languages) and Germanic linguists (investigating morphologically impoverished languages). At times there was strong interaction between the two communities (the key concepts of aspect and Aktionsart emerged as a result of these interactions) but more recently (and in particular, since Western linguistics under the influence of Chomsky and Montague became increasingly formally oriented) the two traditions have tended to go their own way.

As this thesis draws on both the Western and Slavic traditions it is particularly important to have a grasp of the major issues facing both. For example, the verb classification presented in Chapter 4 makes use of empty prefixes. This is something most Germanic linguists would regard as unproblematic (for example, Verkuyl (1999) and Krifka (1989b) routinely discuss examples involving such prefixes) but many Slavic linguists would argue that prefixisation is not a process that gives rise to aspectual pairs. And in the other direction, our verb classification shows that fine-

grained semantic distinctions arise in Polish at the level of the verb, whereas recent Western approaches (for example, by Verkuyl (1972, 1993, 1999) and Krifka (1989b)) have tended to view the level of verb phrase (and the contribution made by direct objects) as aspectually crucial.

In short, one reason for discussing the study of aspect and Aktionsart from a historical perspective is to locate where the approach to Polish verb pairs introduced in this thesis differs from what the reader will find in the various literatures on aspect. But there is another reason why a historical perspective is needed. As we hope to convince the reader (be they readers with Western or Slavic backgrounds), while parts of the approach to aspectual pairs presented in Chapter 4 may initially appear strange, viewed from a historical perspective there is much that is actually quite traditional. In particular, despite the many obvious points of conflict, there are interesting areas of agreement between what we propose and the ideas advanced in Czochralski (1975), the classic study of the Polish verbal system.

We proceed as follows. In Section 2.1 we trace the origins of the study of aspect and Aktionsart. We focus on two developments crucial to later work: Greč's (1827) distinction between tense and an (extremely broad) concept of aspect, and Agrell's (1908) influential subdivision of this broad concept into aspect (in a narrower sense) and Aktionsart. In Section 2.2 we briefly discuss the study of aspect in the Germanic tradition, paying particular attention to the impact of Agrell's ideas. In Section 2.3 we turn to the Slavic tradition. We start by examining the impact of Agrell's work, and then consider a number of issues relevant to this thesis from a historical perspective: the legitimacy of prefixation as an aspectual pair forming operation, how to test for aspectual pairs, and whether 'suffixation' is really so different from prefixation. Section 2.4 continues our discussion of the Slavic tradition, and focuses on another key area: how to draw the line between aspect and Aktionsart in Slavic languages; we pay particular attention to the ideas of Czochralski (1975). In Section 2.5 we discuss contemporary (post Chomsky and Montague) approaches to aspect. Finally, in Section 2.6, we summarize the main points of this history.

2.1 The origins of 'aspect' and 'Aktionsart'

The term 'aspect' is much younger than the concept of aspect. The term 'aspect' appeared in English in 1853, but aspectual distinctions were familiar to Greek and Roman philosophers. The Greeks, for example, were well aware that the difference between the imperfect and the aorist was not of the same kind as the difference between the imperfect and the present. In Plato's *Ion* (530AD) Socrates asks "And did you compete [*egonizu*-imperfect]? And did you succeed [*egoniso*-perfect]?". (The opposition between *egonizu* and *egoniso* is similar to the Polish opposition between *grales* 'to be competing' and *wygrales* 'to have won'.) And four centuries later the Roman writer Marcus Terentius Varro (116 BC-27 BC) described the Latin imperfect as referring to an action that is *incomplete* ('imperfectus'), and the Latin perfect as referring to an action that is *complete* ('perfectus'). But nearly two thousand more years had to pass till, in 1846, Georg Curtius argued in "Formation of the Tenses and

Moods in Greek and Latin, presented Comparatively” that Greek and Slavic aspect represented the same phenomenon.

But while the distinctions relevant to the study of aspect have long been known (at least, by those who have reflected on language), the term ‘aspect’ appeared only much later. In fact *aspect* is a calque from the Russian *vid* ‘(a) view’. The etymological root of ‘aspect’, *spect*, means ‘see’, ‘look (at)’, ‘view’. (Latin *aspectus* ‘a view’; from the past participle of *aspicere* ‘to look at’: *ad-* + *specere*.)

The term ‘vid’ appeared in the early seventeenth-century in the work by Meleity Smetriskiy, but there it did *not* refer to a binary opposition between perfective and imperfective aspect — a concept of aspect of that kind was first found in Miklosich (1926-73) (reprinted from 1868-1875), and only became firmly established in the early 1930s. Rather, ‘vidy’ were treated as part of the *tense* system. For example, Lomonosov (1980) (reprinted from 1764) treats the perfective past of *glotnul* ‘swallowed (once)’ as a ‘semelfactive past *tense*’. In 1812, in a reply to this work, Boldyrev argued that *glotnul* ‘swallowed (once)’ and *glotal* ‘swallowed’ are different verbs, not different tenses, since Russian has only two tenses, namely present and past. Boldyrev seems to have been the first to talk of semantic classes of inchoatives, semelfactives, frequentatives, and so on, without caring whether the relevant meaning was expressed lexically or by morphological marking.¹

‘Vidy’ was first used in 1827 to refer to *non-tense* distinctions in a ‘practical’ Russian grammar by Nikolaj Greč. He clearly separated tenses from aspects, and described the latter as expressing *circumstances of the action*.

The times are limited in nature to three: the present, past, and future, but in grammatical tenses, that is in the forms of languages by which times are expressed, there can be expressed accessory circumstances by which are more closely defined the signification and the extent of the action. . . . The forms serving to express these circumstances of the action are called “aspects”. Quoted after (Binnick, 1991, page 140)

Greč’s separation of tenses from aspects introduced a new set of questions, and helped give birth to the systematic study of aspect in Slavic languages. But it also had an effect on Germanic languages. Greč’s conception of ‘circumstances of the action’ was very general, and this generality made it possible to transpose the concept of aspect to Germanic languages, where it became known as *Aktionsart*, a German term for ‘manner of action’. To quote from Brugmann, a grammarian who played a prominent role in incorporating Greč’s insight into Germanic languages:

Was sonst noch [apart from tense] seit urindg. Zeit [that is, since Proto Indo-European] durch die Verbal- oder Tempusstamm-bildung zum Ausdruck kam, fasst man unter dem Namen Aktionsart zusammen.

Aktionsart ist, im Gegensatz zu Zeitstufe, die Art und Weise, wie die Handlung des Verbums vor sich geht. (Brugmann, 1904, page 492-493)

¹Based on (Binnick, 1991, page 139ff.)

Such a definition of Aktionsart as a verbal category distinct from tense is very broad; clearly far broader than the definition of aspect as a binary opposition between perfective and imperfective aspect.

It is tempting to identify Greč as the starting point for the modern study of aspect and Aktionsart — tempting, but mistaken. The way Brugmann and other Germanic grammarians used the term ‘Aktionsart’ in those days does *not* correspond to the way it is generally used today (though we might say that Brugmann’s ‘Aktionsart’ corresponds to what some contemporary Western formal semanticists mean when they talk in broad terms about aspectuality; for example, Dowty (1979), Moens (1987), and Moens and Steedman (1987, 1988)). That is, Brugmann’s ‘Aktionsart’ is a catchall phrase that covers all three categories later distinguished by Isačenko (1962): aspect, Aktionsart, and Verbalcharacter.² Brugmann did *not* (as it is often incorrectly assumed) separate Aktionsart from aspect by recognizing the lexical nature of the former. Rather, Brugmann used the name ‘Aktionsart’ for Germanic equivalents of the Slavic semantic distinctions that Greč had described as ‘vidy’. And as we have already noted, Greč’s conception of vidy was extremely broad. So in Brugmann’s time there were two and not three distinct categories: the category of tense and the broad category of vidy/Aktionsart.

The three way distinction between tense, aspect, and Aktionsart that we are used to today comes from the work of Sigurd Agrell, who used the notion of ‘Aktionsart’ in his study of Polish verbs as a notion *additional* to the notion of aspect. That is, Agrell (1908) was the first to explicitly distinguish aspect and Aktionsart in Slavic:

Unter Aktionsart verstehe ich ... nicht die beiden Hauptkategorien des slavischen Zeitwortes, die unvollendete und die vollendete Handlungsform (das Imperfektivum und das Perfektivum) — diese nenne ich Aspekte. Mit dem Ausdruck Aktionsart bezeichne ich bisher fast gar nicht beachtete — geschweige denn klassifizierte — Bedeutungsfunktionen der Verbalkomposita (sowie einiger Simplicia und Suffixbildungen), die genauer ausdrücken wie die Handlung vollbracht wird, die Art und Weise ihrer Ausführung markieren. (Agrell, 1908, page 78)

Aspect and Aktionsart, which were *one* before Agrell, were from now on *two* different categories — they could be called by name and talked about separately. Both Slavic and the Germanic aspectology had to adjust to the new situation. And this took quite some time. In Slavic aspectology, the distinction between aspect and Aktionsart began accepted in the early 1930s. However, the notion of Aktionsart did not make it into textbooks on Slavic grammars until the second half of the twentieth century, and it did not make it into Slavic dictionaries until very recently. And in Germanic aspectology, the first half of the twentieth century saw linguists devoting considerable energy to discussing the issue of the existence or non-existence of Agrell’s narrow category of aspect in non-Slavic languages.

² Isačenko (1962) explicitly distinguished between aspect, Aktionsart and *Verbalcharacter*. He separated ‘Aktionsart’ from ‘Verbalcharacter’ by defining the former as derived by formal means, and the latter as referring to the lexical meaning of verb.

The distinction between aspect and *Aktionsart* was problematic from the very beginning — which encouraged a rich fermentation of ideas as scholars tried to find criteria for separating the two categories. Both semantic and morphological criteria were proposed. Important early contributions that worked towards this distinction include, among others, Jacobsohn (1926, 1933), Porzig (1927) (who was inspired by Jacobsohn (1926)), and Hermann (1927). One of the most influential criteria used to distinguish aspect and *Aktionsart* was the ‘subjective/objective’ distinction.

Walter Porzig’s paper “Zur *Aktionsart* indogermanischer Präsensbildungen” argues that these two categories are two different “dimensions” of verb meaning: aspect being the point of view from which an action (“Handlung”) or occurrence (“Vorgang”) is viewed, *Aktionsart* being the manner in which it takes place. Interestingly, he argues that aspect is a binary category, since as a rule, it should be possible to view every event occurrence as in progress or as completed — yet, according to him, whether there indeed is aspect in a concrete language can only be recognized by the morphology, because every meaning must be morphologically encoded:

Der Aspekt ist also seinem Wesen nach streng polar, d.h. wir nennen nur einen solchen Unterschied innerhalb der Verbalbedeutungen Aspekt, der die Vorgänge unter den Gesichtspunkt “Verlauf” und “Ereignis” bringt. Ob es in einer gegebenen Sprache den Aspekt gibt, ist nur zu erkennen durch die Morphologie; denn jede Bedeutungskategorie muss morphologisch fassbar sein. (Porzig, 1927, page 152f.)

Porzig (1927) opens up his paper with a statement that ‘the syntax of the Indo-European verb suffers from a frequent confusion of *Aktionsart* and aspect’ — which, as he explains in a footnote, was clearly made by Jacobsohn (1926).

Interestingly, in the same volume of “Indogermanische Forschungen”, Eduard Hermann independently argues in favour of a distinction between a ‘subjective’ and an ‘objective’ *Aktionsart*. In a “Korrekturnote” to his paper “Objektive und subjektive *Aktionsart*”, he notes that the same ‘subjective/objective’ distinction had actually been proposed a bit earlier by Jacobsohn, in (Jacobsohn, 1926, page 397f.), to distinguish aspect and *Aktionsart*. Hermann explains that he had come to know about the similar ideas of Jacobsohn’s via Porzig (1927), and only after his paper was written (Hermann, 1927, page 227f.). Note that (as the title of Hermann’s paper suggests) the basis for his distinction is semantic. Recall that Porzig took a different view, arguing that morphology was fundamental to the the category of aspect.

Summing up, the work of Agrell marks a transition from aspectological ‘prehistory’ to aspectology as a mature science: his work established the terminology and distinctions that have been the setting for subsequent work. There were two big changes needed for this transition to take place. The first change was made by Greč, who separated tenses from aspect/*Aktionsart*; the second change was Agrell’s own separation of aspect from *Aktionsart*. The two shifts provided the basic conceptual tools that would shape the development of the study of aspect and *Aktionsart* in the twentieth century.

2.2 Germanic aspectology

While Agrell's distinction between 'aspect' and 'Aktionsart' shaped the development of aspectology, it did not ensure that it would develop in a uniform fashion. Then (as now) the study of aspect was divided into two major streams: the Germanic (or nowadays, the Western) and the Slavic. Agrell straddled these two streams (he came from the Germanic tradition but worked on Slavic aspect/Aktionsart), and the two streams mutually influenced each other. Understanding these influences is crucial to understanding the development of aspectology. Nonetheless, each stream has its own identity and concerns (hardly surprising given the differences between Germanic and Slavic languages) so it is also important to try and understand each in its own terms. We start here by briefly looking at the development of the Germanic tradition.

A good place to start with is the work of Jacob Grimm. Grimm was one of the grammarians who pioneered the transposition of the concept of aspect to Germanic languages. Interestingly, he did not think of (Germanic) aspect in the essentially semantic way that nowadays is common in the literature on formal linguistics. Instead, he looked at Germanic oppositions between simple and complex verbs, so his work has a rather Slavic flavour:

It is not impossible to find in the Germanic languages also the traces of a distinction which permeates the Slavic languages. Composites with *ver-*, *be-*, *hin-*, *durch-*, etc. (as in Slavic *po-*, *do-*, *na-*, etc.) perhaps represent perfectives, uncomposed verbs on the contrary imperfectives.

Grimm's ideas strongly influenced subsequent Germanic aspectology, and in particular the work of Streitberg and Brugmann.

Streitberg

Streitberg was strongly influenced by Grimm. He wished to establish a link between Germanic and Slavic languages. He has become well-known in Germanic and Slavic aspectology for his famous contribution "Perfektive und imperfektive Aktionsart im Germanischen". In this study, he tried to show that the Slavic distinction between perfective and imperfective aspect was preserved in Gothic. On the basis of his comparison of Wulfila's Gothic translation of the Bible with the Greek original, he argues that the Gothic verbs compounded with prefixes, such as *du-*, *us-*, *at-*, etc., and especially prefix *ga-*, are perfective counterparts of the corresponding simple verbs, which he analyses as imperfective. An example of such opposition is *taujan* 'to do, to be doing' vs. *gataujan* 'to have done', or *slepan* 'to sleep' vs. *gaslepan* 'to fall asleep'. Interestingly, Streitberg also regarded a number of simple Gothic verbs as perfective. Streitberg (1891) proposes that the whole verbal system of Slavic, as well as that of the Baltic languages, is governed by the following three main semantic categories:

1. *Imperfective/durative/continuous* aspect that presents an action in its uninterrupted duration or continuity;

2. *Perfective/resultative* aspect which adds the moment of completion to the meaning of the verb; this category consists of two subcategories:

momentaneous-perfective aspect, which stresses the moment of termination,
and

durative-perfective aspect that expresses completion together with the duration of action;

3. *Iterative* aspect expressing iteration.

(Incidentally, our use of the term ‘aspect’ in this explanation is somewhat anachronistic. As an example of the terminology used at that time, we remark that Streitberg’s teacher Leskien, in his “Handbuch der albulgarischen Sprache”, refers to Slavic verbal categories of ‘imperfective’, ‘perfective’ and ‘iterative’ as “Handlungsarten (Actiones) des Verbums”; he says: “Durch den Verbalstamm, der die Vorstellung einer Handlung oder eines Vorganges ausdrückt, kann außerdem die besondere Art, wie sich die Handlung vollzieht, mit ausgedrueckt werden” (Leskien, 1962, page170).)

Streitberg’s study had a long-lasting resonance in Germanic research on aspect. It has inspired scholars such as Poutsma (1926) and van Wijk (1928). For instance, Poutsma (1926) proposed the following Streitberg-inspired classification of predications:

1. *momentaneous* predication;
2. *durative* predication, which falls into
 - indefinitely durative* predication,
 - ingressively durative* predication, and
 - terminatively durative* predication,
3. *iterative* predication.

Some Germanic writers criticised Streitberg’s work. Scherer (1954), for instance, speaks of the “complete lack of dependence of Gothic aspect on form”, and more recently, Coleman (1996) argued that the view “of a systematic opposition of perfective and imperfective was strongly overstated” (Coleman, 1996, page 7). And many Slavic linguists strongly objected to Streitberg’s idea that the distinction between perfective and imperfective aspect was preserved in Gothic, and disliked his attempt to transpose the Slavic concept of aspect onto Germanic languages. For instance, Trnka, one of the representatives of the Prague Circle, writes:

It is very hard for a Slavonic philologist to endorse the theory of the eminent German scholar. No period of transition in the system of the Germanic verbal system caused by the supposed loss of verbal aspects has been detected either by Streitberg himself, or by any of his followers, in the history of the Germanic languages, and in modern languages of the

Germanic stock (even in English which has developed since the 15th and 16th centuries some periphrastic forms comparable, from the semasiological point of view, with the Slavonic imperfective aspect). (Trnka, 1982, page 205)

He then refers to other scholars, in particular to Beer and Mourek, who not only objected to Streitberg's comparison of Slavic with Gothic, but who also strongly argued against Streitberg's analysis of the Gothic text. Beer for instance counted the cases that Streitberg listed as exceptions to his theory about the perfectivising working of *ga-*, and considers that they make up 66 per cent of the whole number of verbs compounded with *ga-*. In his opinion, the frequent use of this prefix was due to the tendency of the translator to imitate — as is also the case with other prefixes — the compound verbs in the Greek original, and to the analogy of the past participles. Mourek re-analysed the Gothic text and compared it with the Greek original and came to the conclusion that the Gothic prefixes, such as *at-*, *bi-* *dis-* *in-* *us-*, had nothing to do with the perfective or imperfective aspect. Mourek concluded that no Gothic verbal prefix had the power to convert imperfective verbs into perfective ones, their real function being to modify, or to emphasise the basic meaning of the simple verb.

But Trnka's work on aspect offers more than just criticism of Streitberg. He also proposes a way of relating Germanic languages to Slavic languages. He proposes that within the verbal systems of Czech and English, the word aspect is applied to roughly three different "semasiological series", of which two are represented in Germanic, and three are represented in Slavic. The two first series refer to distinctions that refer to the internal structure of events (these distinctions can be expressed lexically, by prefixes, adverbs, prepositions, or they can be the effect of a specific contextual placing, typically supported by adverbs). The third series — that is, the imperfective vs. perfective opposition — is represented only in the Slavic languages: "the perfective verb denotes an action as a completed fact, in opposition to the imperfective verb which expresses the action as a process".

Brugmann

Brugmann distinguished five kinds of actions — five 'Aktionsarten' (Brugmann, 1904, page 493). They could be expressed by the lexical meaning of the verb, by morphological and syntactical means, and by different tenses. We summarize Brugman's list as follows:

1. *Punctual (momentaneous, perfective, aoristic)* action. It expresses that the action becomes complete at the moment of its inception, or through one single movement. Some verbs were already "an sich" punctual, for instance the German verb *finden* 'to find'. In the case of other verbs, this Aktionsart arose through combination with other sentential elements, for instance with prepositions. Among the tense roots, the aorist was the carrier of the punctual Aktionsart.

2. *Cursive (durative, imperfective) action*. The action is presented as going on, without considering the individual acts within it, and thus the beginning and the end point remain outside the point of view, as for instance in *steigen* ‘to climb’, *leben* ‘to live’. Also for this Aktionsart many verbs had already an “an sich”. Apart from this, this Aktionsart was mostly expressed by the present tense root.
3. *Perfect action*. That is, the action of the perfect root: a state of the subject is described which is the result of its preceding action. For instance, **uoide* (Old Indian *veda* and so on) ‘he has discovered and knows now’ = ‘he knows’. Also, an action can be perceived as a state. For instance, Greek *μεμυκε* ‘he entered into roaring/shouting and he is in the middle of roaring/shouting now’.
4. *Iterative action*. The action is presented as consisting of repeated uniform acts. This group consists mainly of verb forms with reduplication, which yielded this interpretational effect. (Brugmann gives examples from Indo-European, Latin, and Greek.) Iterative action often changes into intensive action (which is interesting if brought into connection with discussions about classifications of Aktionsarten that involve the class of ‘intensives’, a topic beyond the scope of this thesis).
5. *Terminative (durative-perfective) action*. An action is presented as going on, but in such a way that a “terminus”, the beginning or the endpoint, is contemplated (for instance, *er bohrte das brett durch*). According to Delbrueck, originally, this action was expressed by nasal and the *sko-* praesentia. In each case, there were verbs, which in their very concept tended to be used in this way. And yet, they allow a clear presentation of a terminative action as a rule only through other sentential elements, with which they join together to form partial composita. In general, as a result of a combination with prepositions, all cursive verbs could express the meaning component of completion of the action.

The work of Streitberg and Brugmann (and indeed that of Leskien, Poutsma and other scholars from this period) still has influence (for example, these writers were referred to in Verkuyl (1972), the first post-Chomskian analysis of aspect).

The first half of the twentieth century

The work of Brugmann brings us to the beginning of the twentieth century and the impact of the work of Agrell. What effect did Agrell’s distinction between aspect and Aktionsart have on the Germanic tradition? It certainly generated a lot of discussion. During the first half of the twentieth century Germanic aspectology was marked by arguments in favour and against the view that Germanic languages had Agrell’s new narrow category of ‘aspect’. (Nobody doubted that Germanic languages had ‘Aktionsarten’; this was taken as established by the work of Streitberg and Brugmann.) Let us look at what some prominent scholars had to say about this issue.

Deutschbein (1940) and Renicke (1950, 1954a,b, 1961) argued that in spite of the fact that in Germanic languages the category of aspect is not grammatically encoded, speakers of Germanic languages do have a strong ‘feeling’ for aspect:

Im allgemeinen lehnt man das Vorhandensein von Aspekten mit der Begründung ab, daß eine besondere formale Gestaltung der Aspekte im Neuhochdeutschen fehlt . . . Es ergibt sich aber dann das überraschende Resultat, daß unsere Muttersprache ein überaus feines Empfinden für die Aspekte hat. (Deutschbein, 1940, page 76f.)

This mirrors earlier remarks by Jacobsohn (1933):

Aber wenn es im Nhd. auch an Verbalformen fehlt, die im deutlichen Gegensatz zueinander oder in deutlicher Bezogenheit aufeinander die Handlung als durativ oder perfektiv angeschaut charakterisieren, so werden diese Aspekte doch in einer ganzen Reihe von Fällen bei uns sprachlich mit anderen Mitteln dargestellt. (Jacobsohn, 1933, page 295)

Petkov (1965) tried to explain why this was so:

. . . gehen wir von der Tatsache aus, daß die grammatischen Abstraktionen einer Sprache als indirektes Produkt eines langwierigen Erkenntnisprozesses im philosophischen Sinne des Wortes objektiv sind, und da das menschliche Denken als Widerspiegelung der materiellen Wirklichkeit einheitlich ist, müssen sie auch in jeder anderen Sprache ausdrückbar sein. (Petkov, 1965, page 551)

As the quotation from the work of Petkov illustrates, the concerns of Germanic linguists in the first half of the twentieth century became increasingly theoretical — the crucial task was now felt to be to determine and motivate the subject of their study in the light of the conceptual changes brought about by Agrell (1908). And this is a difficult task. Agrell's narrow concept of aspect was inspired by his investigations of Slavic languages. Streitberg's ingenuity notwithstanding (*lesen* 'to read' vs. *durchlesen* 'to read through', and so on), the fact remains that Germanic aspectual morphology is impoverished compared with Slavic aspectual morphology. It is clear that various 'aspectual' oppositions (such as (im)perfectivity, (a)terminativity, (a)telicity, and (un)boundedness) are felt by speakers in Germanic languages, but (as the Germanic grammarians discovered) it is no simple matter to make interesting linguistic generalisations about the mechanisms that support them.

Some writers felt it was simply wrong to import the Slavic notion of aspect into Germanic languages. An early writer who took this view was Porzig (1927); as we have already mentioned, he argued that only Slavic languages have aspect as "jede Bedeutungskategorie muß morphologisch faßbar sein". This view was revived after a critical contribution by Zandvoort (1962) who explicitly argued that "aspect is a conception which does not exist in English Grammar" (Zandvoort, 1962, page 398).

But in general, Germanic researchers gradually came to the view that temporal and aspectual distinctions can be expressed in different ways in different languages, and tried to systematically investigate the means of expressing aspectual distinctions in Germanic languages (they sometimes talked of different sorts of 'aspects' by which they meant different ways in which aspectual distinctions are expressed in Germanic

languages). They often tried to bring order into their description by reworking concepts from Slavic aspectology. The word ‘reworking’ is important here: in general they consciously re-defined the Slavic definitions for use in German linguistics, and did not attempt to simply transpose them. For example, an important contribution was made by Renicke (1950, 1954a,b, 1961). In his 1961-paper ‘Deutsche Aspektpaare’, he applies the concept of aspectual pairs to German, but he applies this concept to pairs of *sentences*, not verbs. He argues that transposing the Slavic way of defining aspect to German leads to misunderstandings, since German aspect is a syntactico-stylistic category, and not a verbal category. At a general level he proposes two types of German aspect pairs (‘Vergangenheitsaspekt’ and ‘Zukunftsaspekt’) and seven single aspects (that is, five ‘syntaktische Aspekte’ and four ‘syntaktische Wortbildungsaspekte’).

Another example of such an approach is the work of Hans Pollak. In his 1967 paper he tried to define in a precise way the notions of aspect and Aktionsart (he found the contributions by Renicke imprecise), and to provide an up-to-date presentation of the state of research in the field of German aspectology. He distinguishes between aspects and Aktionsart as follows:

Als “Aspekte” betrachte ich also bestimmte charakteristische Aktionsarten, durch die zwei sonst semantisch identische, morphologisch verwandte Sprachformen (oder Sprachformungen) in ihrer Bedeutungsfunktion voneinander abweichen. (Pollak, 1967, page 404)

What can we say at a more general level about the Germanic tradition? Two remarks are worth making. First, the researchers who argued that aspect in Germanic languages is expressed by different stylistic and syntactic means, back up their arguments with an impressive range of examples. In so doing they opened the door to new lines of research, notably the interaction between aspect and direct objects (examples of such interaction were discussed by several researchers over the course of the 20th century, and indeed by earlier researchers). We draw attention to this because when the Western linguistic tradition (under the influence of Chomsky and Montague) assumed an increasingly formal character, the interaction between aspectual constructions and direct objects (that is, what happens at the level of verb phrase) became the primary focus of research in formally oriented work. The pioneering paper here was Verkuyl (1972), and the next chapter of this thesis is devoted to a study of how this work and the related work of Schoorlemmer (1995), Krifka (1989b) and Filip (1993) applies to Polish.

Second, it seems fair to say that over the course of the 20th century the Germanic tradition researchers forged what is nowadays the received view of aspect in the West. We might summarize this received view as follows. First, aspect is to be distinguished from both tense and Aktionsart (though whereas its demarcation from tense is relatively clear, what demarcates it from Aktionsart is rather more problematic). Second, no special status is awarded to morphological criteria (say for distinguishing aspect from Aktionsart). Rather, aspect is viewed as relatively abstract linguistic category that can be realized in many different ways in different languages. Thirdly, this abstract system is viewed as governing a number of important oppositions in natural

language (such as (im)perfectivity, (a)terminativity, (a)telicity, or (un)boundedness) that have to do with the character of events and the way we view them.

Loosely speaking, we might say that this is an essentially *semantic* view of aspect. This is not an entirely satisfactory way of putting matters (though it does seem to be what Renicke was trying to get at when he called aspect a syntactico-stylistic category) but it is useful in two ways. First, it draws attention to the fact that the intuition that holds together the received Western view is the idea that natural languages have developed a number of mechanisms, independent of those used in the tense system, *for structuring the way we view events*. It seems reasonable to call this intuition essentially semantic. Second, while this characterization of the Germanic tradition may not be the best possible, it does have the merit of distinguishing what is important in the received Western view from what is important in the Slavic tradition. For, as we shall now see, if ‘semantics’ is the key word in the Germanic tradition, the key word in the Slavic tradition is ‘morphology’.

2.3 The Slavic concept of aspect

In this section we discuss the impact of Agrell’s work on the Slavic tradition. As we have just noted, the primary impact of Agrell’s work on the Germanic tradition was to point it in a direction that eventually led to the (Western) received view of aspect: that aspect is an abstract system, independent of the tense system, for structuring the way natural languages encode information about events — a system that can be realized in different ways in different languages. Agrell’s impact on the Slavic tradition was very different: his work inspired deep morphologically oriented research on Slavic aspect. Many of the themes discussed in contemporary Slavic aspectology trace their inspiration to the influence of Agrell. To give the most obvious example, after Agrell divided the broad concept of ‘aspect’ (Greč’s ‘vidy’) into ‘Aktionsart’ and a narrow conception of ‘aspect’, the new identity of ‘aspect’ started to gradually assume a binary shape.

But the road was neither short nor easy — and this may seem surprising. After all, Agrell’s narrow concept of ‘aspect’ was inspired by his work on the morphologically rich Slavic languages; as the concept was born in Slavic languages, why should it be difficult to apply it there?

In fact, there are many difficulties — or rather, problems: the sort of problems that give rise to research traditions. Let us mention two right away. First, many Slavic linguists were uncomfortable with the non-uniform realization of Slavic aspect: why did some verbs form aspectual pairs via prefixation, and other via suffixation? Another (tough) problem lay in the cutoff point between aspect (in Agrell’s new narrow sense) and Aktionsart. Where did one end and the other begin? Moreover, given that prefixation of verbs was often the method used to embody Aktionsart distinctions, this problem interacted with the previous one. Finally, these problems were made harder (or more interesting) by what seems to have been an implicit consensus by members of the Slavic research community: a morphological solution to these problems was required. At the time of Agrell’s work morphology (along with phonology) was perhaps the most rigorous branch of linguistics. To be sure, semantic ideas were sometimes

appealed to, but it must have seemed that only an account of aspect (and its demarcation from Aktionsart) that was couched in morphological terms would be a truly solid solution.

These remarks only scratch the surface of a complex topic. The purpose of this section (and the next) is to try and give the reader some idea of the themes and problems that have occupied Slavic aspectologists over the course of the twentieth century. Many of these themes (for example, the notion of an empty prefix, various issues surrounding suffixisation in Polish, and the aspect/Aktionsart distinction) will play an important role in this thesis, particularly in Chapters 4 and 5 where we present our own approach to Polish aspectual pairs.

2.3.1 Aspectual pairs

The reader may well have come across the view that perfectivity presents an action ‘from the outside’ whereas imperfectivity presents it ‘from the inside’; such binary views have been influential in Slavic (and indeed Germanic) aspectology, and in his much-quoted textbook on aspect, Comrie (1976), adopts this approach. But where (and when) did these kinds of binary definitions arise?³

The earliest of them preceded the work of Agrell. In 1877 Emil Černý characterized perfective aspect as presenting an action as

... gesammelt, geschlossen, in ihrer Gesamtheit, summarisch, in gedrängter Form.

Miklosich (1926-73) introduced the concept of ‘completion’:

Eine Handlung wird entweder als dauernd dargestellt oder als vollendet ausgesagt. (Miklosich, 1926-73, page 247)

Definitions in terms of the opposition between ‘punctual’ and ‘linear’ can be found by Buslajev, Potebnja, Peškovskij, among others. Vinogradov (1947) introduced the concept of ‘inner endpoint’, the goal of an action (‘vnutrennyj predel dejstvija’) (Vinogradov, 1947, page 497).

Such views fitted well with the new ideas of Agrell, which encouraged grammarians to view aspect in terms of binary oppositions and aspectual pairs. Perhaps the most influential of these approaches in Slavic aspectology was Černý’s original definition of perfectivity. (An analogous way of thinking about aspect can be found in de Saussure (1922), who describes perfective aspect as presenting an action ‘in its totality’.) Černý’s view was richly elaborated in subsequent work. For example, from this starting point Růžička (Růžička, 1952, page 4, 165) and Dostál (Dostál, 1954, page 15) arrive at a description of perfective aspect as presenting the process as a whole, located entirely in the field of vision of the speaker, viewed from outside, in a perspectival view. However, whereas Růžička connected the feature of totality of action with the

³We base our presentation of the definitions of aspectual opposition on Isačenko (1962). A similar, but a more extended presentation can be found in Dostál (1954).

feature of its inner endpoint/temporal limitation, Dostál excluded temporal elements from his definition.

An important example of how Černý's view was incorporated into contemporary Slavic research, is the work of Maslov. He describes perfective aspect as the 'positive, strong, intensive' (that is, the marked) member of the aspect correlation and assigns to it the general meaning of 'indivisible whole/entirety of the event' ("unteilbare Ganzheit der Handlung").

Under the influence of the definitions just described, aspect started to be theorised about in binary terms. Around the beginning of the twentieth century, there gradually arose the concept of an aspectual *pair*: a pair consisting of an imperfective and perfective *form* of one and the same verb. This binary view on aspect was for the first time explicitly expressed by Agrell (1908), and became firmly established after Jakobson (1971b).

The notion of aspectual pair needs to be understood in opposition to Aktionsart. In fact, it is precisely the notion of aspectual pair that the Slavic school uses to delimit what is truly aspectual from the merely Aktionsart. That is, the Slavic school approach views the link between perfective and imperfective *aspect* as being realized by the existence of an aspectual pair. The two members of the pair are viewed as two forms of the same verb, and (a crucial point) they are viewed as having precisely the same *lexical* meaning. To be sure, there is certainly a semantic distinction between the perfective and non-perfective forms of any verb: this semantic distinction has something to do with a binary opposition concerning the way an event is viewed, such as the opposition between the completeness and incompleteness of an action. Nonetheless, this semantic distinction (which is usually viewed as the *only* semantic distinction between the two verbs in the pair) is *not* viewed as lexical — rather, it is the contribution of the aspectual system. Thus the difference between Agrell's narrow concept of aspect and Aktionsart is captured by saying that changing *aspect* does *not* affect lexical meaning of the verb, whereas deriving an Aktionsart variant of a verb does result in a 'modification' (though not a complete change) of the verb's lexical semantics.

This abstract concept of an 'aspectual pair' is relatively clear, however its concrete realization in Slavic languages is not. The Slavic school views an aspectual pair as a pair of verbs that differ in aspect but not in lexical meaning, and views the pairing operation as being carried out by grammatical/inflectional morphemes. And, ultimately, this is the source of the debate in the Slavic school literature connected to aspectual pairs and Aktionsarten: determining what a legitimate (aspectual) grammatical morpheme actually is. Roughly speaking, the situation is this. Most Slavic school researchers would not see any problems with considering the Polish 'suffix' *-(y/i)w(a)-* as a grammatical morpheme, and would probably be unanimous in agreeing that verb pairs whose members are linked by this operation are indeed true aspectual pairs. The controversy begins when verb pairs linked by prefixation (by empty prefixes) are considered. To give a simple illustration: all grammarians agree that *kupić-kupować* 'to have bought/to be buying' is an example of an aspectual pair; they disagree as to whether *pisać-napisać* 'to be writing/to have written' is a true aspectual pair as well

or should be viewed merely as an example of the (resultative) Aktionsart.

The sense of unease with regard to prefixation stems from an obvious fact about Polish (and other Slavic languages): prefixation is a highly productive process, and Polish verbs can typically take a wide variety of prefixes, which have a wide variety of effects. Is it really justifiable to view one of these prefixes, the empty prefix, as having the same grammatical/inflectional status as a suffix? Moreover, the prefixes are clearly morphologically related to Polish prepositions — thus is it not more correct to view the prefixation process as a word-formational process, and hence a word sense changing process, and hence as an intrinsically Aktionsart operation? This approach has been robustly defended by many (probably most) Slavic grammarians, but it does have one drawback. Most basic verbs are imperfective and their perfective equivalents are derived by prefixation. So if only suffixal pairs are aspectual pairs, the Polish verbal system is *not* correctly characterized as consisting of aspectual pairs.

The choice between admitting empty prefixation as an aspectual operation, or abandoning the notion of aspectual pairs is fundamental, and of direct relevance to this thesis. In Chapters 4 and 5 we will develop and defend an approach in which most Polish verbs occur in aspectual pairs. This means that we are going to admit certain forms of prefixation as true aspectual operations. Thus it will be useful if the reader has a deeper grasp of the various issues involved in prefixation, empty prefixation, and suffixation, and we devote the remainder of this section to exploring these ideas from a historical perspective.

2.3.2 Issues concerning prefixation

Work on verbal prefixation in Slavic has always wrestled with the question of whether a pair consisting of a verb and a verb derived from it by prefixation should be regarded as a pair of ‘forms of the same verb’ or a pair of ‘different verbs’. The first Czech grammar “Grammaticae Bohemicae...” from 1603 by Benedikt Nudožersky treats complex verbs derived by prefixation from a basic verb as forming one group together with that verb. However, in a later Czech grammar written by Rosa in 1672, another view was defended: the different complex verbs derived from one basic verb were regarded as independent of each other (Chatterjee, 1988, page 11).⁴ The reason for the controversy between Nudožersky and Rosa lay in their insistence on treating all prefixes in a uniform way: either as grammatical or derivational morphemes.

However, the global view on prefixation started to be gradually recognized as unsatisfactory. For instance, Agrell (1908) indicated that the combination of prefixes with basic verbs is not arbitrary — rather, certain types of bases combine with certain types of prefixes (Agrell, 1908, page 124f.). There have been attempts made in the literature to capture the relation between a prefix and a basic verb.

Most importantly however, the literature of the field is permeated with attempts to separate the ‘lexical’ from the ‘grammatical’ meaning of a prefix. Prefixes became divided into classes according to different criteria — for instance, according to their

⁴We were not able to access the work of Nudožersky and Rosa, hence the reference to the secondary source.

aspectual role. It was recognized that some prefixes seem to bring about a change in the aspectual value of the basic verb, but do not change its lexical meaning, while some other prefixes clearly change both the aspect and the lexical meaning of the verb to which they apply. This two-way division of prefixes was made more fine-grained by some writers: prefixes were divided into three classes. That is, it was proposed that some prefixes clearly are word-formational morphemes (that is, they change the lexical meaning of the basic verb), some others (namely, the so-called ‘empty’/grammatical prefixes) are means of forming aspectual pairs (that is, they do not affect the lexical meaning of the basic verb but only perfectivise the basic verb), and some are means of forming Aktionsarten (that is, they change aspect but also modify the lexical meaning of the basic verb). However, while the two-way division of prefixes was relatively easy to maintain, the three-way division of prefixes has always been rather unstable. In particular, it has always been problematic to draw a line between the aspectual (‘empty’) and the Aktionsart prefixes. The class of Aktionsart prefixes seems to have been used as a dustbin for all those prefixes which did not really derive a new verb, but which also involved a slight modification of the way an event was presented.⁵

Let’s examine an important three way division proposed in the literature. Bogusławski (1963) distinguishes between three types of possible relations between the prefix and the base: ‘selection’, ‘determination’ and ‘interdependence’. The selection relation between the basic verb and its prefix exists if the prefix completely changes the lexical meaning of the basic verb — that is, the prefix is used as a word-formational means. The determination relation arises if the prefix does not change the lexical meaning of the basic verb, but only changes its aspect — that is, the prefix is used as an aspectual pair forming means. The interdependence relation is proposed as a sort of ‘intermediate’ relation between the first and the second, and Bogusławski postulates it in order to capture the effect of the delimitative prefix *po-*. However, at the same time he also suggests that very often this prefix can be treated on a par with prefixes that induce a ‘determination’ relation. This is interesting, for it suggests that in Bogusławski’s opinion there may not exist an essential difference between aspectual pair forming prefixes and Aktionsart forming prefixes.

The preceding discussion was rather abstract; let’s illustrate the two/three-fold function of prefixes with a simple example.

Consider the basic imperfective *pisać* ‘to write’. This verb can combine with a number of different prefixes — for instance, with *na-*, *prze-*, *od-*, *pod-*, *w-*, *do-*, *s-*, *po-*, *z(a)-*. If considered independently of the verb, these prefixes can be associated with a number of meanings, which typically are the meanings of the formally (roughly) identical prepositions from which these prefixes developed. For example,

⁵The fact that the transition between the different classes of prefixes is rather flowing, led some researchers to propose that the three-fold division of the aspectual role of prefixes is actually not definite but gradual — see for example Barentsen (1985). This is an interesting view, and it can be nicely linked with the argument of Bybee (1985) that the distinction between lexical, derivational and inflectional categories is a scalar one. However, this is not the way we think of prefixes in this thesis. We don’t think of prefixes as *being* derivational or inflectional — rather, we think of them as being *used* for one of these two purposes in a particular formation.

the preposition *na* most typically means ‘on’, *przez* (which gave rise to the prefix *prze-*) typically means ‘through’, *od* typically means ‘from’, *pod* means ‘under’, *w* means ‘in’, *do* means ‘to/towards’. Prepositions *z*, *za*, and *po* can be ascribed a far wider range of meanings — for instance, *z* can mean ‘with’, ‘of’, ‘from’, etc.; *za* can mean ‘behind’, ‘for’, ‘in’, etc.; *po* can be translated as ‘after’, ‘by’, ‘on’, ‘for’, ‘to’, etc. The result of applying any of these prefixes to the verb *pisać* is a perfective verb. But apart from this perfectivising effect, the result of their application to the verb *pisać* is not uniform. Some complex prefixed verbs are new lexical items when compared with the basic non-prefixed verb, some are not. One could treat all the prefixes that do not derive new verbs as aspect or Aktionsart forming prefixes. One could also take a more fine-grained look at the prefixes that do not derive new verbs, and distinguish between the aspectual pair forming prefix (that is, the ‘empty’ prefix), and the Aktionsart forming prefix. Let us illustrate these different possibilities with respect to *pisać*.

Most of the prefixes listed above are word-formational with respect to *pisać*: they derive verbs the lexical meaning of which clearly differs from the lexical meaning of the basic verb. For example: *przepisać* ‘to copy/to prescribe’, *spisać* ‘to make a list of/to draw up’, *odpisać* ‘to copy/to crib/to answer (a letter)’, *wpisać* ‘to write in’, *podpisać* ‘sign’, *dopisać* ‘to add writing’, *zapisać* ‘to write down/to take down’ etc.

However there are two prefixes among those listed above that are clearly different: the prefix *na-* and the prefix *po-*. As we have already discussed, the *na-* prefix serves as what is often called the ‘empty’ prefix of the verb *pisać*: this traditional terminology is meant to suggest that *na-* does not change the lexical meaning of this verb, but only makes it perfective. If combined with the verb *pisać* ‘to write’, *na-* contributes the meaning of completion of the action of writing: the complex perfective verb *napisać* means ‘to finish writing’. Of course, if the meaning of completion is considered as a lexical meaning component, then this prefix is analysed as an Aktionsart prefix. For this reason, Czochralski (1975), which takes a ‘suffixation only’ position on aspectual pairing, says that *na-* derives the ‘resultative Aktionsart’ for *pisać*. In the following section we will examine Czochralski’s views on the aspect/Aktionsart distinction in Polish more closely.⁶

What about the other special prefix, *po-*? This is usually considered a prototypical example of an Aktionsart prefix. It is analysed as deriving the delimitative Aktionsart, and hence is called the delimitative prefix. This prefix is thought of as ‘delimiting’ the period of time during which the event referred to by the basic verb took place. That is, *popisać*, like *napisać*, asserts that a reading episode has been completed —

⁶It should once again be emphasized for non-Polish reader that the prefix *na-* does not serve as empty (or if you prefer, does not serve as the ‘resultative Aktionsart’ prefix) with all verbs to which it applies — rather, it serves as empty (or ‘resultative’) with some verbs, and as a word-forming morpheme with other. To put it another way, in Polish formally different prefixes serve as empty with different verbs, and there is not one single prefix that always serves as empty. For example, in *przeczytać* ‘to finish reading’ the prefix *prze-* serves as empty prefix, and in *wypić* ‘to finish drinking’ it is *wy-*. For native speakers of contemporary Polish, the use of a particular prefix as ‘empty’ is something done instinctively, without being aware of the prepositional origin of such a prefix; for non-native speakers it is something (rather painful) that they need to learn ‘by heart’, as knowing the meaning of the basic verb and the original preposition can often be misleading.

but there is a difference in how this completion is conceived. In the case of the empty prefix *na-* (or if you prefer, in the case of the ‘resultative’ Aktionsart prefix *na-*) the reading episode is conceived of as ‘naturally’ over. In particular, there is a sense that the natural terminus (say the completion of the book) was achieved. In the case of the ‘delimitative’ Aktionsart *po-*, the action is conceived of as merely finished — the natural terminus was not reached.

Somewhat ironically, the *po-* prefix, though most often cited as being Aktionsart in its function, has also been called ‘the most neutral prefix semantically’ (Comrie, 1976, page 89); the same view is taken by (Vinogradov, 1947, page 553ff.), and according to (Flier, 1977, page 224), this can be explained by the wide applicability of this prefix. So why is this prefix called an Aktionsart prefix? Because it is often described as contributing the meaning ‘for a while’, hence it is thought of as modifying the lexical meaning of the verb to which it applies. However, Isačenko (1962) and Czochralski (1975) argue that although the translation in terms of ‘for a while’ might be helpful, it actually is not fully correct; they argue that all that the delimitative prefix *po-* does is contribute the meaning of temporal limit of the event is now over. The verb classification introduced in Chapter 4 determines to what verb classes this prefix can be applied, and it shows that when applied to culminating process verbs, *po-* expresses that the process ended before the culmination was achieved (whereas achievement of the culmination is expressed by the empty prefix *na-*).

To sum up, as we have seen, many different views on whether prefixation can be regarded as a ‘true’ aspectual pair forming operation are possible, and the position taken on this matter may well interact with the position taken on the distinction between aspect and Aktionsart in Slavic languages. To round off this discussion, let’s summarize three contrasting views on these issues: that of Czochralski (1975), that of Bogusławski (1963), and that of this thesis.

1. Czochralski (1975) is the classic statement of what is probably the current received view on aspect (and Aktionsart) in Polish: only suffixation is a legitimate means of forming aspectual pairs, and aspect and Aktionsart can be distinguished. Czochralski’s book is without a doubt the single most important study of the Polish aspectual system, and is interesting for at least two reasons. First, Czochralski backs up his account with a corpus of 9,000 Polish verbs. Second, Czochralski is well aware of the difficulties underlying his approach, namely that it is hard to draw a principled semantic distinction between verb pairs linked by suffixation and verb pairs linked by prefixation, and that it is hard to draw the required line between aspect and Aktionsart in Polish. Czochralski does not attempt to hide the difficulties, but wrestles with them openly, which is another reason his book is such a valuable resource.
2. Bogusławski (1963) takes a line that in certain respects is rather like that of this thesis. In particular, Bogusławski argues that verb pairs linked by prefixation are just as much ‘true aspectual pairs’ as verb pairs linked by suffixation. However Bogusławski’s approach, unlike the work of this thesis, is not based on word-formational analysis: it is purely semantic. This leads to some interesting

differences. For example, Bogusławski rejects the use of the secondary imperfectivisation test (see below) which is a cornerstone of our approach. Moreover, in this thesis delimitative *po-* is treated as an *aspectual* formant. As we mentioned above, Bogusławski seems uncertain about how to handle *po-*. Although he invented a separate notion of ‘interdependence’ to cover it, he sometimes seems to view it as giving rise to a relation of ‘determination’ between verbs (that is, as giving rise to aspectual pairs).

3. This thesis argues that a word-formational analysis of the Polish verbal system is important because this is the level at which semantic regularities emerge. In particular, we shall show that at the word-formational level it is possible to give a uniform analysis of (almost all) Polish verb pairs irrespective of whether they are formed by prefixation or suffixation. Moreover, our semantic analysis will make it clear why some kinds of verbs have more than one perfectivising option: the delimitative *po-* prefix (and indeed, the ‘semelfactive’ *-ną-* suffix) simply emerge as natural alternative ways of perfectivising the verbs belonging to certain classes. So, unlike Czochrański, we have no need of a separate category of Aktionsart.

2.3.3 Testing for aspectual pairs

Are there devices that can help to draw the two/three-way division among the prefixes (that is, devices that determine which prefixes do and which don’t change the lexical meaning of the verb)? Or to put it in a different way: is it possible to check whether a pair consisting of a basic and a complex verb is an aspectual or Aktionsart pair?

Two major tests have been proposed in the literature, and one of these, the ‘secondary imperfectivisation’ test, plays a crucial role in this thesis. The test is traditionally explained as follows. If a prefix derives a perfective verb that differs from the basic verb with respect to lexical meaning (that is, if it derives a new verb), then that new complex verb should be again imperfectivizable (that is, it should be ‘secondarily imperfectivizable’); the complex perfective verb and its imperfective counterpart derived by the *secondary* imperfectivisation form an aspectual pair. On the other hand, if the derived verb cannot be secondarily imperfectivised, it means that it already formed a perfective counterpart of the basic imperfective verb.

Let’s illustrate this. Consider the verb *pisać* ‘to write-impf’ and the possibilities of secondary imperfectivisation for complex verbs derived from it by prefixation:

<i>pisać</i> ‘to write-impf’	<i>napisać</i> ‘to write-perf’	* <i>napisywać</i>
	<i>popisać</i> ‘to write-perf’	* <i>popisywać</i>
	<i>podpisać</i> ‘to sign-perf’	<i>podpisywać</i> ‘to sign-impf’
	<i>przepisać</i> ‘copy-perf’	<i>przepisywać</i> ‘copy-impf’

According to the test, the pair *pisać/napisać* — and indeed, the pair *pisać/popisać* — are aspectual pairs. The fact that the perfective verbs cannot be again imperfectivised suggests that they form a pair together with the basic verb from which they

were derived. In Chapter 4 we define a generalized form of this test (and introduce a mirror image test that we call the secondary perfectivisation test) and use these test as the basis for determining what the aspectual pairs of Polish are. One of the virtues of these tests is that they reduce to a minimum the role played by semantic intuition.

Another test for aspectual pairs is application of the Historical Present: the forms that can be used in Historical Present as equivalents of the past tense perfective forms are their aspectual counterparts. For example: *Wczoraj wróciłam do domu, napisałam list...* ‘Yesterday, I came back home, I wrote a letter...’. If we put this sentence in the Historical Present, we get *wczoraj wracam do domu, piszę list...* ‘yesterday, I am coming back home, I am writing a letter...’. The empty prefixed verb *napisałam* ‘I wrote/finished writing’ in the past tense sentence is replaced by the basic imperfective verb *piszę* ‘I am writing’. Exactly the same Historical Present sentence can substitute *Wczoraj wróciłam do domu, popisałam list...* ‘Yesterday, I came back home, I wrote a letter (for some time)...’. That is, the delimitative prefixed verb *popisałam* ‘I wrote (for some time)’ can be replaced by *piszę* ‘I am writing’. This use of the test does not detect any difference in the lexical meaning of the two perfective forms *napisać* ‘to finish writing’ and *popisać* ‘to write (for some time)’. The use of the Historical Present is an appealing and intuitive way of testing for aspectual pairs. However, we will not use it as the basis for our later work as we feel that our generalized Secondary Imperfectivisation (and Perfectivisation) tests get closer to the heart of our formant based approach to aspectual pairing.

What is the status of these tests in the literature? Generally speaking the literature is largely divided on the issue along the lines you might expect. That is, researchers who believe the notion of aspectual pair is fundamental tend to view the tests with favour, for these tests are powerful evidence in favour of the pre-theoretic intuition that Polish verbs typically come in pairs. Similarly, researchers who distrust prefixation (that is, those who view pairs of verbs formed by means of empty prefixes as examples of Aktionsarten) tend to argue that these tests are unreliable. There are some interesting exceptions to this however. In particular, Bogusławski (1960, 1963) argues that there is no real semantic difference between pairs built by suffixisation and those built by empty prefixes, nonetheless he rejects the use of the secondary imperfectivisation test.

2.3.4 Suffixisation

Many researchers who argue that pairs of Polish verbs derived by empty prefixation are not aspectual pairs, are not particularly meticulous about the morphology of verbal pairs derived by the so-called ‘suffixisation’ of perfective verbs. In the previous chapter we discussed suffixisation from a diachronic perspective. Now we shall briefly examine what two of the most important ‘suffixisation only’ writers on Slavic aspect have said about suffixisation from a synchronic perspective. As we shall see, both Isačenko (one of the most important 20th century writers on Slavic aspect) and Czochralski (author of the classic study of the Polish aspectual system) were well aware that Slavic ‘suffixisation’ is far from simple. We return to the topic of ‘suffixisation’ in more detail in Chapter 4.

Pairs of verbs established by imperfectivising ‘suffixation’ of the perfective member have always been regarded as true aspectual pairs, since ‘suffixation’ has been always regarded as indisputably a grammatical process. Perfectivisation by empty prefixes, on the other hand, is often regarded as fundamentally different from imperfectivisation, because empty prefixes are not a formally uniform class of formants, and because formants formally identical to them can function as word-forming morphemes. But in reality, matters are far more nuanced. A more careful look shows that (like empty prefixation) the process of imperfectivisation is not formally uniform either, and the ‘suffixal’ formants it employs can have word-formational functions as well. That is, an examination of the morphology of perfectivisation by empty prefixes and imperfectivisation by suffixes, does not fully support a principled formal separation between imperfectivisation and perfectivisation — as the more sophisticated writers on aspect (such as Isačenko and Czochralski) were aware.

For a start, it is not even clear whether one can describe the process of imperfectivisation of perfective verbs in terms of ‘suffixation’. Isačenko (1962) observes that the so-called ‘suffixation’ does not even always involve a suffix, and he speaks in such a case of a ‘suffixless imperfectivisation’ (“suffixlose Imperfektivierung”) (Isačenko, 1962, page 368). Moreover, Isačenko observes that there is not just one single suffix that imperfectivizes a perfective verb — instead, there are several suffixes, and it is not obvious which suffix applies to which verbal form, or verbal stem. Finally, suffixation is connected to vowel and consonant changes in the verbal root (which suggests a link with the lexicon) (Isačenko, 1962, page 366). Consider the following quotation from Isačenko:

Die sekundäre Imperfektivierung wird durch Anfügung verschiedener Suffixe an den Verbalstamm durchgeführt. Dabei kommt es aber zu bestimmten typischen Veränderungen in der Betonung, sowie Vokal- bzw. Konsonantenwechsel innerhalb des Verbalstammes. Die morphologischen Mittel, die bei der Bildung sekundärer Imperfektiva verwendet werden, dienen auch zur Bildung zahlreicher Aktionsarten. Somit ist die Kenntnis der hier in Betracht kommenden morphologischen Verfahren unerlässlich. (Isačenko, 1962, page 368)

The imperfectivisation process is complex and can involve suffixation as well as vowel alternations. Czochralski (1975), who investigated the morphology of the imperfectivisation process in Polish, comes to similar conclusions as Isačenko (1962). Since, as he argues, the process of imperfectivisation does not simply consist in suffixation, but involves several morphological and phonological changes, he calls it ‘morphological change’. When we present our Polish verb classification in Chapter 4 we shall follow Czochralski (1975) in referring to the imperfectivisation mechanism as *morphological change*.

But recognizing the complex (roughly speaking, two-component) structure of the imperfectivising process does not yet make it completely transparent. There exists plenty of stereotypes and confusion about the shape of the mechanism of morphological change in the literature. As Isačenko puts it:

Die Frage nach den *formellen* Mitteln der bei der Bildung sekundärer Imperfektiva in Frage kommenden Stammerweiterungen bzw. Stammbildungen ist gar nicht so einfach zu beantworten, wie dies vielleicht auf den ersten Blick zu sein scheint. Traditionellerweise wird der ganze Sachverhalt etwa so formuliert: Sekundäre Imperfektiva werden “vermittels der imperfektiven Suffixe *-yva-* (*-iva-*), *-va-* und *-a-* (*-’a-*) gebildet” (AkGr I, 432) [*‘Academy Grammar’*, Moskva 1954]. Damit ist aber noch lange nicht gesagt, an *welche* Verbalformen bzw. an welchen Verbalstamm diese Suffixe angefügt werden. (Isačenko, 1962, page 366)

Isačenko points out several problems connected to the way the mechanism of morphological change is commonly analysed in the literature of the field. He shows that it is not at all clear what an imperfectivising formant is actually applied to. He discusses the status of the vowel *-a-* that very often precedes the infinitive ending of an imperfective member of an aspectual pair; he argues that although this *-a-* has been given several names in the literature (since the 1957-contribution by Jakobson, it is called a “Stammsuffix” (Jakobson, 1971a, page 10), and traditional grammars call it a “theme-vowel”), it is not clear what it really is and which function it plays; how does this *-a-* relate to the regular ‘suffixes’, and why is it not always present? He also provides examples of imperfectivisation, which involve changes in the root; he points out, that it is unwise to ignore them, as they are rather systematic.

In short, Isačenko clearly shows that the process of morphological change is not uniform from a formal point of view; and more than that: he argues that this process is often intransparent and induces many questions. We cannot present the details of Isačenko’s fascinating discussion, but refer the reader to the source.

As we said at the beginning of this section, many writers who argue against viewing prefixal pairs as aspectual pairs have not been particularly meticulous about the morphology of pairs based on imperfectivisation. As we have seen, Isačenko is exempt from this criticism, and another noteworthy exception is Czochralski. Czochralski sees that there are difficulties, and presents morphological and semantic grounds for differentiating between prefixal and ‘suffixal’ verb pairs. There are two major morphological grounds. First, he argues that what he calls morphological change is a grammatical process that serves exclusively the purpose of aspectual pairing — and in this context, he calls the imperfectivising formants “aspect suffixes”:

Die imperfektiven Partner werden von den perfektiven abgeleitet und zwar mit Hilfe von Aspektsuffixen. Die alternierenden Aspektsuffixe dienen keinem anderen Zweck als dem Ausdruck der Aspektopposition. Dies bedeutet, daß die Aspektkategorie ihre eigenen morphologischen Ausdrucksmittel hat. Diese Exklusivität zeugt unzweifelhaft davon, daß der Aspekt eine morphologische Kategorie ist. Die Aspektsuffixe erfüllen ausschließlich grammatische Funktionen. Deswegen müssen sie für grammatische Morpheme gehalten werden. (Czochralski, 1975, page 15)

Another ground is that the aspect category forms pairs and not triples. Interestingly though, just before presenting this as the distinctive property of aspect (in contrast to

Aktionsart), Czochralski says that he wishes to leave open the question whether some Aktionsarten maybe do come in pairs:

Die Frage, ob einige Aktionsarten nicht doch in binäre Oppositionen zu fassen sind, wollen wir dahingestellt sein lassen. Demgegenüber haben wir es beim Aspekt nur mit zwei entgegengesetzten Polen zu tun — mit dem perfektiven und dem imperfektiven Aspekt. Aspektpaare wie *dać* und *dawać* z.B. unterscheiden sich voneinander nur durch die beiden Aspekte: *dać* is perfektiv, *dawać* imperfektiv. Ein Drittes gibt es nicht. Aus diesem Grunde können wir von dem Aspekt sprechen und ihn als eine binäre grammatische Kategorie betrachten. (Czochralski, 1975, page 18)

But as we shall see in the next section, Czochralski also recognizes that the same means (namely morphonological change) which is used to build what he regards ‘true’ aspectual pairs is also used in order to derive iterative verbs. That is, the argument referring to the exclusivity of the ‘suffixation’ as an imperfectivising operation is undermined by Czochralski himself. We have also seen that not only verbs built by morphonological change, but also verbs built by empty prefixation may, and indeed do, come in binary oppositions (that is, they cannot be secondarily imperfectivized). Moreover, in the next section we shall discuss Czochralski’s attempt at distinguishing between aspect and Aktionsart as two distinct semantic categories (“Begriffskategorien”). In particular, we shall show that the pairs of verbs that Czochralski describes as related to each other by the resultative Aktionsart relation are based on exactly the same semantic distinction as the true aspectual pairs: namely, ongoing vs. completed (“pre-resultative” vs. “resultative”) (Czochralski, 1975, page 25).

Before discussing this, however, let us briefly mention the views of Bogusławski. As we have already mentioned, Bogusławski (1960, 1963) argues that there is no real semantic difference between ‘suffixal’ and ‘prefixal’ pairs. Bogusławski believes the apparent difference can be explained by the possibility of an association of prefixes with formally (roughly) corresponding prepositions. That is, where some ‘suffixation only’ authors are tempted to point to the existence of related prepositions as evidence that prefixation induces lexical meaning shifts, Bogusławski neatly turns this argument on its head — the existence of such prepositions has simply distracted linguists from what would otherwise be completely (semantically) obvious: no principled distinction exists.

2.4 The Slavic concept of Aktionsart

The German term ‘Aktionsart’ literally means ‘kind of action’. Introduced by the Germanic tradition, right from the start Aktionsart was treated as something that could be expressed in a variety of ways, such as by verbal lexical semantics, by formal means (morphology and syntax), or by tenses or explicit tense markers (perfect).

Just as the Germanic tradition found it difficult to incorporate the notion of aspect, the Slavic tradition found it difficult to incorporate the notion of Aktionsart. In fact, Isačenko goes as far as to say:

Trotz gewisser Ansätze hat sich in der traditionellen Aspektlehre die Theorie der *Aktionsarten* nicht durchgesetzt. (Isačenko, 1962, page 361)

Indeed, the notion of *Aktionsart* cannot be found back in contemporary Slavic dictionaries, and it is hard to find in schoolgrammars. Transposed to Slavic linguistics, the concept of *Aktionsart* was never as clearly delimited as the concept of aspectual pairs.

The basic idea of *Aktionsart* in the Slavic tradition was that it should only ‘specify in more detail’ how the action took place — that is, *Aktionsart* should ‘modify’ the lexical meaning of the basic verb, but not change it completely. This led to the view that *Aktionsart* could be contributed by several affixes.⁷ Another important characteristic ascribed to an *Aktionsart* verb is that it is ‘unpaired’ — that is, it does not have an aspectual twin.⁸ Understood in this way, the concept of *Aktionsart* was vague and difficult to apply. On the one hand, it was not clear which morphological means might qualify as means of forming *Aktionsarten*; at the same time, there seems to have existed an assumption that an *Aktionsart* formation should represent a productive process — that is, the *Aktionsart* deriving affix should be applicable to a large number of verbs, and it should yield the same semantic effect. On the other hand, it is not clear to what degree the lexical semantics might be affected; but then, the underlying assumption of the Slavic study of *Aktionsart* seems to be that the *Aktionart* modification should modify the temporal properties of the event described by the basic verb (Binnick, 1991, page 145ff.). So the key problem was: how much of the lexical meaning of the basic verb may an affix change so that the complex verb neither qualifies as an aspectual form of the basic verb, nor as a new lexical item? If *Aktionart* affixes modify the lexical meaning of the basic verb, exactly what components of (temporal) meaning can they change? That is, on the one side, *Aktionart* formation was to be distinct from word-formation, and on the other, it was to be distinct from the process of aspectual pairing.

How *Aktionart* in Polish can be distinguished from outright word change is not a topic of relevance to this thesis, and we won’t discuss it further. But how Polish aspect and *Aktionart* are to be differentiated is of interest (the verb classification presented in Chapter will treat both delimitative *po-* and semelfactive *-ną-* as giving

⁷ Isačenko (1962) explicitly distinguished between aspect, *Aktionart* and *Verbalcharacter*. He separated ‘*Aktionart*’ from ‘*Verbalcharacter*’ by defining the former as derived by formal means, and the latter in terms of the lexical meaning of verb.

⁸The issue is rather delicate. Some of the (perfective) *Aktionart* verbs can and some cannot be secondarily imperfectivised. If an ‘*Aktionart* verb’ can be secondarily imperfectivised, it should be treated as a new verb, and the ‘*Aktionart* affix’ that was used to derive it, should be regarded as a word-formational affix. If, on the other hand, an *Aktionart* verb cannot be again imperfectivised, it should, in several cases, be treated as an aspectual twin of the basic verb from which it was derived, and the ‘*Aktionart* affix’ should be treated as an aspectual formant. Let us illustrate this. Scholars who apply the concept of *Aktionart* argue that the empty prefixes are *Aktionart* prefixes; that is, a verb such as *napisać* ‘to write-perf’ is a resultative *Aktionart*, and not an aspectual twin of *pisać* ‘to write-impf’, since it adds a (lexical) meaning of an achieved result; *napisać* ‘to write-perf’ cannot indeed be secondarily imperfectivised. However, on the other hand, a Russian verb such as *pročítat* ‘to read-perf’ (but not its Polish correspondent *przeczytać!*) can be again imperfectivised, and this is taken as an argument for the view that *pročítat* ‘to read-perf’ is a resultative *Aktionart* of *čítat*, and not its aspectual twin; *pročítat* is then thought of as being paired with the secondarily imperfectivised verb *pročítivat*’ (Isačenko, 1962, page 363); note that *pročítivat*’ has an iterative and not a single episode interpretation.

rise to aspectual pairs, not merely to Aktionsart variants) so let's discuss some of the received ideas on this topic.

As we have already said, the sharp separation between Slavic aspect and Aktionsart was first proposed and argued for by Agrell (1908), but it became established only in the 1930s (though, as we saw above, as late as in the 1960s, Isačenko could remark that the concept of Aktionsart hadn't yet carried through to 'traditional aspect study'). Researchers have given involved morphological and semantic arguments in favour of this distinction. As the reader might recall, examples of important contributions are Jacobsohn (1926, 1933), Porzig (1927), Hermann (1927). One of the main *semantic* arguments in favour of distinguishing between these categories was the conviction that aspect was a subjective and Aktionsart an objective category. As aspect is often thought of as involving the perspective from which the event is viewed (for example, 'from the outside' or 'from the inside'), it is often described as subjective. Aktionsart, on the other hand, can be described as being a property of an event, so in this sense it could be said to be objective. But the 'subjective/objective' distinction is not the only distinction that is thought of as underlying the distinction between aspect and Aktionsart in Slavic. The difference between the two categories is often explained in terms of a number of semantic oppositions. Let's consider them.

Aktionsart is often thought of as a *lexical* category. By definition, Aktionsart describes the manner in which the event takes place. Aktionsart is distinguished from aspect by assuming that it changes the lexical meaning of the basic verb. It is often thought of as not related to the tense system. Aktionsart is not considered to be an obligatory or a binary category of a Slavic verb.

Aspect, on the other hand, is thought of as an obligatory, binary category of a Slavic verb — in sharp contrast to Aktionsart, Slavic aspect is described as *grammatical*. It is typically treated as part of the Slavic temporal system. School grammars as well as traditional grammars describe aspectual opposition as an opposition between complete and incomplete tenses; see for instance Czochralski (1975).

Let's put all this in a table:

Aspect	Aktionsart
subjective	objective
perspective	property of situations
grammatical	lexical
temporal	atemporal
obligatory	facultative
binary	not binary

Presented in this way, the distinctions may seem clear-cut — but the fact that their correctness has been passionately discussed throughout the twentieth century suggests that they are in fact far from unproblematic. Indeed, objections have been raised against all of the oppositions in terms of which the 'aspect/Aktionsart' distinction has been explained. Let us briefly consider the 'grammatical vs. lexical', and the 'subjective vs. objective' distinction, which have played a particularly important role in trying to determine where the line between aspect and Aktionsart should be drawn.

Some people questioned the ‘grammatical vs. lexical’ distinction, some wondered what it *really* meant. The distinction is removed automatically if one treats aspectual forms as independent verbs. But if one starts to think about the concrete meaning of calling something a *grammatical* category, interesting questions arise. The fundamental question has never been conclusively answered: do the formal means of aspectual modification — and in particular, the empty prefixes — belong to *inflectional* or *derivational* morphology? This question is in reality rather hard to answer for such a category as Aktionsart. It is not obvious how one can treat Aktionsart as a purely lexical category if at the same time one maintains that it is expressed by explicit formal means that just give a more detailed description of how the action expressed by the basic verb takes place. And perhaps the question cannot be answered definitively, because the distinction between inflection and derivation might in fact be, as Bybee (1985) argues, a (gradual) distinction in the *amount* of semantic content of a morpheme.

Consider again the ‘subjective vs. objective’ distinction. Many writers have referred to the ‘subjective vs. objective’ distinction when trying to explain the opposition between aspect in Aktionsart — for instance, Hermann (1927), Jakobson (1971b), Maslov (1962), Forsyth (1970), Comrie (1976), among many others. Surprisingly few people have objected to this rather flimsy distinction. An interesting discussion about it can be found in Pollak (1967). Pollak explains how the concepts ‘objective’ and ‘subjective’ might have been transposed to aspectology via the study of mood; the tradition of analysing the category of mood in terms of a ‘subjective’ category comes from the Greek grammarians, and was continued by the great German grammarians such as Wilhelm Wundt and Karl Brugmann (Pollak, 1967, page 409ff.). According to the received view, aspect is called ‘subjective’, because it is thought of as being determined by the speaker’s free choice of the perspective from which he wishes to view an event. Aktionsart, on the other hand, is called ‘objective’, because it is thought of as reflecting properties of the event, which is regarded as a ‘real-world’ entity. But this simple claim doesn’t withstand scrutiny. It is difficult to see how *popisać* ‘to write for a while’, and *napisać* ‘to finish writing’ should be objective but not *pisać* ‘to be writing’. And why would the perfective *kupić* ‘to have bought’ be subjective but not the perfective *napisać* ‘to write/to finish writing’?

Czochralski on Aktionsart and aspect

Many attempts have been made to pin down what Aktionsart in Slavic is. Not only morphological criteria, but as we saw above, also semantic distinctions have been invoked in order to separate the two concepts. But none of the attempts seems satisfactory — and given the uneasy way Aktionsart in Slavic languages is balanced between aspect and word change, this is hardly surprising. But one attempt to capture the essence of Polish aspect and Aktionsart cannot be easily dismissed, namely the approach in Czochralski (1975). This book, a detailed examination of the Polish verbal system, gives a classical account of the Slavist’s theoretical account of Aktionsarten, and their relation to aspect. Czochralski’s view on Aktionsarten is based on an Aktionsart classification proposed by Isačenko (1962). However, there is one crucial

difference between the two classifications: in contrast to Isačenko, Czochralski does not include under Aktionsarten the ‘semelfactive’ Aktionsart.

We here present and discuss Czochralski’s classification of Polish Aktionsarten and his analysis of the distinction between aspect and Aktionsart. First, we shall identify ‘Aktionsarten’ which actually do not belong to the Aktionsart system, and we shall rule them out. Most of the Aktionsarten that we shall rule out are actually refused the name ‘Aktionsart’ by Czochralski himself, they do not completely fit the definition of Aktionsart, and moreover they cannot be accounted for within Czochralski’s theoretical setup. What will remain, will be Aktionsarten that encode temporal distinctions on the events denoted by the basic verbs. We shall then consider Czochralski’s semantic analysis of Polish aspect and Aktionsart, and we shall show that it does actually not support a distinction between these two categories. We shall also consider Czochralski’s formal arguments for the aspect versus Aktionsart distinction, and we shall argue that they are not convincing. We shall conclude that what Czochralski analyses as distinctions in Aktionsart are actually reflections of the aspectual class of the basic verb that is perfectivised.

Czochralski (1975) divides Aktionsarten into imperfective and perfective Aktionsarten, but he remarks that the perfective Aktionsarten are much more developed than the imperfective ones (Czochralski, 1975, page 24). The translations are direct English correspondents of Czochralski’s German translations (if there are no direct English equivalents available, Czochralski’s German translations are given in brackets); (Czochralski’s translations tend to emphasise the meaning component that is the basis for categorisation of a verb under a certain Aktionsart class).

- Perfective Aktionsarten

resultative

zreperować ‘to have repaired’ (“fertig werden mit reparieren”) ⇐ *reperować* ‘to repair’;

ingressive

zapachnieć ‘to begin to smell’ ⇐ *pachnieć* ‘to smell’;

delimitative

poczytać ‘to read for a while/a bit’ ⇐ *czytać* ‘to read’;

distributive

popalić ‘to burn everything, one thing after another’ ⇐ *palić* ‘to burn’;

evolutive

rozśpiewać się ‘to get into singing’ (“sich freisingen”) ⇐ *śpiewać* ‘to sing’

partial-resultative

leczyć-podleczyć ‘to have cured partly’ ⇐ *leczyć* ‘to cure’;

- Imperfective Aktionsarten

iterative

czytywać 'to read from time to time/use to read' \Leftarrow *czytać* 'to read';

comitative

przygrywać 'to play (to something)/accompany by playing' \Leftarrow *grać* 'to play';

extended iterative:

(i) diminutive iterative

popadywać 'to rain a little from time to time' \Leftarrow *padać* 'to rain',

(ii) intensive iterative

poszukiwać 'to look (for something) eagerly' \Leftarrow *szukać* 'to look (for something)'.

Let us start with a few simple observations about Czochralski's Aktionsart classification. First, most of the perfective Aktionsarten cannot be again imperfectivised, and the imperfective Aktionsarten cannot be again perfectivised (unless going back to the original verb from which they are derived). Second, with a few exceptions, Czochralski's Aktionsarten are temporal in nature: they refer to the phasal structure of events (and indeed, these verbs, as a rule, do not allow for secondary imperfectivisation). What we called "exceptions" are unproductive and atemporal Aktionsarten (typically, the unproductive Aktionsarten are atemporal). Third, as we shall soon see, Czochralski analyses Aktionsarten as being built on essentially the same semantic distinctions on which aspectual pairs are built. Since the analysis involves temporal distinctions only, only Aktionsarten that induce temporal distinctions can be accounted for within Czochralski's theory of aspect and Aktionsart. And now for the last observation. When describing particular Aktionsarten listed above, Czochralski remarks that some of them actually should not be called Aktionsarten: namely, the unproductive Aktionsarten ("Von dem Terminus Aktionsart sehe ich hier bewußt ab. Es gibt nämlich nur wenige Verben dieser Art" (Czochralski, 1975, page 23)). It seems that the unproductive and atemporal Aktionsarten, which we called exceptions, should rather be treated as instances of a word-forming mechanism, as they for instance tend to have secondary imperfectives. So let us rule out the unproductive and atemporal Aktionsarten from Czochralski's classification.

Some of the Aktionsart verbs listed in Czochralski's classification presented above, when discussed, are actually explicitly refused the name 'Aktionsart'. These are the following verbs: iterative, comitative, diminutive and intensive iterative verbs — that is, the imperfective Aktionsarten. Other verbs which are according to Czochralski unproductive, are partial-resultative Aktionsart (Czochralski, 1975, page 22-24). When these quasi-Aktionsarten are ruled out, we are left with resultative, ingressive, delimitative, distributive and evolutive Aktionsart.

Let us now consider the distributive and the evolutive Aktionsarten in order to rule them out as well. The first glance at the (not very extensive) list of 'distributive Aktionsart' verbs reveals that they share a lot with the delimitative Aktionsart verbs. For a start, they are both derived by means of the same prefix. Secondly, neither of them can

be secondarily imperfectivised. Furthermore, the distributive verbs have a delimitative interpretation as well — indeed, they seem to have the delimitative interpretation as their basic interpretation. The distributive interpretation can arise in certain contexts, and under certain conditions — for instance, if the direct object is in plural. Consider Czochralski's example *popalić*, a verb that he translates as 'to burn everything one thing after another'. Actually, a distributive reading of this verb can arise only in a specific context. Perhaps it can arise in the sentence *Jan popalił wszystkie książki* 'Jan burned all (the) books'; but then, it is not clear at all that Jan necessarily burned the books one after another. Typically though, this distributive meaning effect does not arise for the verb *popalić*. In any case, it does not arise if the direct object is in singular: *Jan popalił ognisko* 'Jan made/has been making bonfire (for some time)', *Jan popalił w piecu* 'Jan heated/has been heating with a stove (for some time)', etc. But it also does not necessarily arise when the direct object is in plural: *Jan popalił papierosy* 'Jan smoked/has been smoking cigarettes (for some time)'. Hence we prefer to think of the verbs listed by Czochralski under the 'distributive Aktionsart verbs' as delimitative verbs, which can yield a distributive meaning effect when placed in certain contexts. Verbs that are derived as 'evolutive Aktionsart' are more accurately analysed as new lexical items. They have a different argument structure than the verbs to which they are linked within Czochralski's Aktionsart classification, and they can be secondarily imperfectivised. Consider *rozśpiewać się* 'to get into singing'. It is possible to secondarily imperfectivise this verb: *rozśpiewywać się* 'to be getting into singing': *Jan rozśpiewywał się, kiedy zgasły światła* 'Jan was getting into singing, when the light went out'. Similarly, *rochorować się* 'to have become really sick', becomes secondarily imperfectivised to *rochorowywać się* 'to be becoming really sick'. But the secondarily imperfectivised forms are rarely needed, and hence rarely created.

The remaining Aktionsarten are the following: the resultative, the ingressive, and the delimitative Aktionsart. Czochralski describes the ingressive and the delimitative Aktionsarten as productive Aktionsarten, and the resultative Aktionsart as an "extraordinarily productive" Aktionsart. As he puts it, the resultative Aktionsart modifies the basic verb with a clear shade of meaning: it emphasizes the achievement of the result of the action. He says that the ingressive Aktionsart emphasizes the onset of the course of the action, and does not say anything about the end result of it. He presents the delimitative Aktionsart as connoting the action as a partly performed one. He notices that this meaning shade can be often, although not precisely, mirrored with expressions such as 'for a while', 'a bit', 'to a limited extent' (Czochralski, 1975, page 20-21). These Aktionsarten follow the Slavic definition of Aktionsart in the following sense: they are productive, they encode temporal distinctions, and verbs expressing them cannot be secondarily imperfectivised. Moreover, the resultative and the delimitative Aktionsart can be accounted for within Czochralski's semantic analysis of Polish Aktionsarten (this is less clear for the ingressive Aktionsart). By contrast, the Aktionsarten that we have ruled out, cannot be accounted for within Czochralski's semantic analysis. As we mentioned earlier, Czochralski's account of the semantics of Polish aspect and Aktionsart does not have notions at its disposal that would capture the unproductive atemporal Aktionsarten. (Incidentally, Czochralski's analysis does

include the notion of iterativity, but as we said, he refrains from analysing iterative verbs as true Aktionsart verbs.)

Czochralski argues that Polish aspect and Aktionsart can be analysed in terms of the three semantic distinctions (thought of as ‘features’):

imperfective	perfective
durative	momentaneous/non-durative
iterative	semelfactive/non-iterative
pre-resultative	resultative

Czochralski explains that from a semantic perspective, aspect differs from Aktionsart only as to the *distribution* of these semantic features. In particular, he argues that in the case of an aspectual pair the three semantic features always come together in form of a “bundle”. By contrast, an Aktionsart verb is in his view characterized in terms of one single feature. Hence Czochralski defines a true aspectual pair as a polystructural category, and Aktionsart as monostructural category.

But Czochralski does not seem to maintain the semantic analysis of the aspectual pair in terms of a bundle of features. Nowhere do we find a concrete illustration of his view on the semantic difference between aspect and Aktionsart.

Indeed, we shall now show that Czochralski describes the semantics of a true aspectual pair in exactly the same way as he describes the semantics of the resultative Aktionsart: namely in terms of an achieved result. Czochralski illustrates the resultative Aktionsart with the perfective verb *zreperować* ‘to have repaired’ which is derived from the imperfective verb *reperować* ‘to be repairing’ by applying the empty prefix *z-*. As an example, Czochralski uses the sentence *Reperowałeś rower, ale go nie zreperowałeś* ‘repaired-impf bike, but it-acc not repaired-perf’ ‘You were repairing the bike but you haven’t repaired it’. He argues that the perfective prefix *z-* besides making *reperowałeś* perfective, also contributes the meaning of an achieved result, which he takes as a lexical and not a temporal semantic element. Hence he calls the verb *zreperowałeś* a resultative Aktionsart verb. Czochralski describes the semantics of a true aspectual pair in terms of the same ‘pre-resultative’ versus ‘resultative’ distinction. As an illustration Czochralski uses the sentence *Ojciec już mi dawał pieniądze na rower, ale w końcu nie dał* ‘father already me-dat gave-impf money for bike, but in the end not gave-perf’ ‘Father was already giving me the money for the bike, but finally he didn’t give it to me’. He describes the imperfective *dawać* ‘to be giving’ as ‘pre-resultative’, and the perfective *dać* ‘to have given’ as ‘resultative’ — that is, in exactly the same way as he described the semantics underlying the opposition between *reperować* ‘to be repairing’ and *zreperować* ‘to have repaired’. And indeed, in another chapter of his book, Czochralski explicitly argues that verbs standing in the resultative Aktionsart relation, do function as true aspectual pairs in the process of communication. He calls pairs of verbs which theoretically are not true aspectual pairs, but in reality do function as such, “secondary aspectual pairs”. It should be noted that when discussing the aspectual pair *dać-dawać* ‘to give’, Czochralski does not mention the two other features belonging to the bundle.⁹

⁹This observation seems to support Isačenko’s illuminating remark that the criterion of calling something

We have just seen that Czochralski's distinction between aspect and Aktionsart is not supported semantically. But Czochralski also provides a formal argument in favour of the aspect/Aktionsart distinction. In particular, he argues that the imperfectivising suffix *-yw-* is used exclusively for the purpose of the formation of aspectual pairs. According to him, this is an unquestionable argument that aspect, in contrast to Aktionsart, is a morphological, and a grammatical category. As he puts it:

Die alternierenden Aspektsuffixe dienen keinem anderen Zweck als dem Ausdruck der Aspektopposition. Dies bedeutet daß die Aspektkategorie ihre eigenen morphologischen Ausdrucksmittel hat. Diese Exklusivität zeugt unzweifelhaft davon, daß der Aspekt eine morphologische Kategorie ist. Die Aspektsuffixe erfüllen ausschließlich grammatische Funktionen. Deswegen müssen sie für grammatische Morpheme gehalten werden. (Czochralski, 1975, page 15)

But as we could see above, Czochralski's own Aktionsart classification makes explicit that it is not the case that the suffix *-yw-* that is used for the aspectual purpose, is used for this purpose exclusively. The iterative verbs and their subclasses contain namely formally an identical suffix *-yw-*. Interestingly, when discussing these verbs, Czochralski says that the reason why he refrains from actually analysing them as Aktionsart verbs is that (except of being unproductive and rare) they do not contain a prefix, but the suffix change — and the suffix change is a means of forming aspectual pairs.

Ein weiterer Grund für diese Auffassung besteht darin, daß diese Verben kein Präfix aufweisen, sondern einen Suffixwechsel im Vergleich mit den Grundverben. Der Suffixwechsel ist aber das aspektbildende Mittel. (Czochralski, 1975, page 23)

Czochralski's argument for distinguishing between aspect and Aktionsart on the basis of formal criteria does not seem more convincing than his argument based on semantic considerations. It seems that the only argument in favour of the distinction between aspect and Aktionsart is the assumption that the suffix *-yw-* is a grammatical and a prefix a word-formational morpheme (an indication of this view we could see in the last quotation). But this assumption represents a rather problematic criterion for distinguishing aspect from Aktionsart. For instance, it appears problematic when one compares Slavic languages to each other. For instance, the Polish perfective verb *kupić* 'to buy-perf' is imperfectivised by the suffix *-ow-* to form *kupować* 'to buy-impf', and hence, it is considered to be an aspectual pair. However, the Russian imperfective equivalent of the basic perfective verb *kupit'* 'to buy-perf' is *pokupat'* 'to buy-impf' (that is, except of suffixisation, it undergoes prefixation).

Nonetheless, Czochralski's contribution is constructive in two ways: first, through the insight that the notion of perfective and imperfective aspect cannot be exhaustively

an aspectual pair actually depends on the meaning that one ascribes to the opposition between perfective and imperfective aspect (Isačenko, 1962, page 360).

described in terms of one universally-applicable semantic notion (he argues that it involves a ‘bundle’); and second, through his failure to prove that two verbs forming an aspectual pair are indeed based on the bundle of three semantic notions, in contrast to two verbs forming an Aktionsart pair.

Instead, it seems that the different features that Czochralski proposes in order to analyse Polish aspect and Aktionsart are reflections of the aspectual class of the basic verb to which an aspectual (or for that matter, an ‘Aktionsart’) formant applies. We can view the resultative, the ingressive, and the delimitative meaning effect as a result of making different sorts of verbs perfective. Intuitively, different events can get completed in different ways. There is no principal distinction between aspect and Aktionsart, and it also does not make sense to speak of there being in Polish two separate though related categories of aspect and Aktionsart. This view on Czochralski’s contribution is revealed by our aspectual classification of Polish verbs, presented in Chapter 4.

As we have seen from this discussion, it is difficult to come to a coherent account of what Aktionsart in Polish actually is. Nonetheless, for a traditional Slavic linguist who believes that only suffixes can give rise to true aspectual pairs, Aktionsart is a very useful category to have around. It gives a convenient name for such inconvenient prefixed pairs as *pisać* vs. *napisać* and *pisać* vs. *popisać*. Of course, calling these pairs ‘Aktionsart’ means that the story about what Aktionsart is becomes very complicated, as they have to be treated as the resultative Aktionsart and the delimitative Aktionsart, respectively. Nonetheless, the battle to find a concept of Aktionsart that covers all these things probably seems worth while from such a perspective. After all, it allows the concept of aspectual pairs to be restricted to verbs linked by suffixation, and hence allows aspect to be viewed as an inflectional category. But we think the formant-based approach to aspectual pairing presented in Chapters 4 and 5 is far more simple and revealing.

2.5 Aspect and Aktionsart in contemporary linguistics

As we have seen, research on aspect has long been carried out in two separate streams, the Germanic and the Slavic. After 1957 these two streams became even more sharply differentiated. The cause was the publication of Noam Chomsky’s “Syntactic Structures”. Among its other contributions, Chomsky (1957) inaugurated a more formal, mathematically oriented, approach to linguistics, which quickly came to dominate syntactic and phonological research in the West. The new emphasis on mathematical precision was extended to semantics in the early 1970’s by Richard Montague, who showed how the idea of model-theoretic interpretation could be applied to natural languages (see Montague (1974)).

What were the effects on aspectology? In the Germanic tradition, the impact was profound. The work of Chomsky and Montague brought about a complete change of paradigm in the Germanic tradition. Aspect had to be re-discovered and re-located inside this new research territory, and investigated with formal tools. A number

of researchers rose to the challenge: for example, Dowty (1972, 1979), Verkuyl (1972, 1993, 1999), Kamp (1981a,b), Kamp and Rohrer (1983a,b), Kamp and Reyle (1993), Krifka (1989a,b), Moens (1987), and Moens and Steedman (1987, 1988) investigated aspect in non-Slavic languages.

It is worthwhile briefly discussing the work of David Dowty. Not only was his book “Word Meaning and Montague Grammar” one of the earliest in the new paradigm, it was (and remains) one of the most detailed, and influential.

Dowty is quite explicit about his aims. In the opening sentence of the book’s Foreword he states:

The most general goal of this book is to propose and illustrate a program of research in word semantics that combines some of the methodology and results in linguistic semantics, primarily that of the generative semantics school, with the rigorously formalized syntactic and semantic framework for the analysis of natural languages developed by Richard Montague and his associates . . .

His second aim is to

. . . dispel the misconception widely held by philosophers that all interesting and important problems of natural language semantics have to do with so-called logical words and their compositional semantics rather than with word-semantics . . .

To illustrate that these goals are achievable, Dowty shows that Vendler’s “Aristotelian” verb classification of states, activities, accomplishments, and achievements can be incorporated into Montague semantics. The book is devoted to applying these ideas to a wide variety of problems in the temporal semantics of English, particularly those where the semantics of tense and time adverbials is intertwined with verb meaning.

Dowty’s book is rightly regarded as a key contribution to the study of aspect. But two comments should be made. First, there is a sense in which Dowty works with a very broad conception of ‘aspect’. Second, there is a sense in which his conception of ‘aspect’ is actually rather narrow.

Dowty’s conception is broad in an obvious sense. He refers to Vendler’s verb classification as an *aspectual classification*. This is clearly a long way removed from Agrell’s narrower concept of aspect. Rather, it is a modern relative of Streitberg’s and Brugmann’s broad, Greč-inspired notions of *Aktionsart*. And indeed, what Dowty calls ‘aspect’ would in terms of traditional aspectology be called ‘*Aktionsart*’: it is ‘objective’ and ‘stable’ (it has a solid model-theoretic interpretation), and it is ‘lexical’. Dowty’s broad use of the term ‘aspect’ is widespread in post-Montagovian approaches to aspect; for example Moens and Steedman (1987, 1988) use the term ‘aspectual’ in a similarly broad way.¹⁰ This broad usage is quite acceptable and under-

¹⁰Dowty himself was well aware that he was using the term *aspect* in broader sense than usual: in his discussion of the matter (page 52) he calls his usage “not a wholly appropriate term”. But he then goes on to give an interesting justification for it, remarking that “It is because of this intricate interaction between classes of verbs and true aspect markers that the term *aspect* is justified in a wider sense to the problem of understanding these classes of verbs . . .”.

standable. For a start, the formal paradigm is a new one, and its practitioners should be free to choose terminology as they see fit. Moreover, it is worth recalling that Agrell's narrower conception of 'aspect' was inspired by his work on Slavic languages. It is not obvious that a close correlate of Slavic aspect exists in Germanic languages with their far weaker verbal morphology. Indeed, as we have seen, Germanic grammarians devoted more than 50 years after the work of Agrell to debating precisely this point!

But in spite of this expansion of the term 'aspect', Dowty's conception of 'aspect' is in another sense quite narrow. Slavic researchers have long emphasized the 'subjective', 'dynamic', 'speaker-oriented' interpretation of aspect. And these ideas *can* be modeled formally. Hans Kamp (who was investigating the semantics not of a Germanic language but of French; see Kamp (1981a,b), Kamp and Rohrer (1983a)) showed that speaker perspective and the discourse effects could be incorporated into formal semantics; this work culminated in the development of Discourse Representation Theory (DRT) (see Kamp and Reyle (1993)). Now, we are not trying to suggest that Kamp's views on discourse interpretation can be identified with Agrell's narrow concept of aspect; indeed this seems quite implausible. Rather, the point is that the new formal paradigm gave rise to a wide range of tools, and these tools have proved capable of modeling a wide range of different themes in 'aspect' (construed broadly) — or at least, they have proved capable of doing so when applied to non-Slavic languages.

And this brings us to the next point. What were the effects of the new formal paradigm on the Slavic school? Initially very little. For social and historical reasons, the work of Chomsky and Montague did not resonate in the then East bloc nearly as loudly as it did in the West. So most Slavic aspectologists simply continued to work as descriptive grammarians: they held on to the classical Slavic approach to aspect, which emphasizes morphological rather than semantic work.

The Slavic school carried out a great deal of important work in this period. In particular, the work of Maslov (1962, 1963), and Isačenko (1962) consolidated and extended the existing work of the Slavic school, and became something of a reference point for work in this tradition. Moreover (and of particular relevance to this thesis) Czochralski (1975) was an exhaustive examination of the aspect and *Aktionsart* in Polish from the traditional Slavic perspective. We might sum up by saying that much of the work of this period is best viewed as the steady continuation (and often, culmination) of work on the traditional Slavic themes that Agrell's work initiated at the turn of the twentieth century.

But not all work of this period can be viewed this way. There appeared a few papers (never influential) that were semantically rather than morphologically oriented. Interestingly, within this semantic substream, one can even find anticipations of concepts that were later developed in the Western formal semantical tradition. In particular, in the 1970's, Francesco Antinucci and Lucyna Gebert analyse Polish verbal aspect with the help of what is known after the work of Moens (1987) and Moens and Steedman (1987, 1988) as the 'nucleus structure' of an event. The contribution was first published in Italian in Antinucci and Gerbert (1975/76) and later in Polish in Antinucci and Gerbert (1977). Karolak (1996) remarks that the contribution, al-

though a “breakthrough” in the way of the interpretation of the category of aspect as a grammaticalized *semantic* category, did actually not bring about a radical change in the way aspect is investigated in Slavic linguistics. Interestingly, as one of the most probable reasons for the ignorance of this contribution, Karolak (1996) names its ‘crucial distinction from the depictions of the category of aspect characteristic for the contemporary — and especially, Slavic — aspectology’ (Karolak, 1996, page 9).

Moreover, more recently, this period saw the first signs of another transfer (the latest in a long line) between the Germanic and Slavic traditions. In particular, Verkuyl (1972, 1999) and Krifka (1989b) took their Germanically inspired formal accounts of aspect, and attempted to apply them to Slavic languages. Somewhat later, Schoorlemmer (1995) (building on the work of Verkuyl) and Filip (1993) (building on the work of Krifka) further extended this program. Because of its direct relevance to the concerns of this thesis, we shall devote the whole of the following chapter to their investigations. Mention should also be made of Carlota Smith, and her two-component analysis of aspect. Smith (1991) draws a distinction between grammatical aspect and lexical aspect, which is somewhat reminiscent of the distinction between aspect and Aktionsart. However, there are few points of contacts between her work and ours and we won’t discuss her work in our thesis.

2.6 Summary

We have covered a lot of ground in this chapter, and there is a risk that the reader may have lost track of the main stages of the story in the mass of details. So, to conclude, here is a schematic view of some of the main points of the historical narrative:

1. Before 1908: Aspectology as a pre-science

- Slavic aspect originally viewed as part of the tense system.
- Greč (1827) introduces a broad view of aspect (‘circumstances of action’). This conception is adopted by the Germanic grammarians under the name Aktionsart.
- Distinct Slavic and Germanic streams of aspectology emerge.
- In the Germanic stream, Grimm, Streitberg, Brugmann, and others carry out comparative studies (paralleling what Greč did for Slavic).
- In the Slavic stream, Miklosich, Černý, and others build the beginnings of a binary view of aspect.

2. After 1908: Aspectology as mature-science

- Agrell (1908), drawing on ideas from both the Germanic and Slavic traditions, distinguishes aspect from Aktionsart in essentially the manner used today. Aspectology, using these new conceptual and descriptive tools, becomes a mature science.

- The Germanic stream responds to Agrell's ideas by becoming increasingly theoretical. Considerable energy is devoted in the first half of the twentieth century to seeing whether Agrell's new concept of aspect applies to Germanic languages.
- The Slavic stream responds to Agrell's idea with intensive linguistic investigations, developing the binary view of aspect, and addressing the problems raised by prefixation and the link between aspect and Aktionsart.

3. After 1957: Western linguistics enters a formal phase

- With the publication of "Syntactic Structures" Western linguistics enters a formal phase. The work of Richard Montague extends this phase to semantics in the early 1970s.
- Researchers such as Dowty, Verkuyl, Kamp, Krifka, Moens, and Steedman apply formal methods to the study of aspect and Aktionsart for non-Slavic languages.
- Workers in the Slavic linguistic tradition are relatively untouched by the formal approaches of Chomsky and Montague. For the most part, their work continues to be carried out from a morphological perspective (though there is an interesting substream of semantically oriented work). Notable achievements during this period include the work of Maslov, Isačenko, and Czochralski's exhaustive examination of the Polish verbal system.
- Researchers from the Western tradition of formal semantics, notably Verkuyl and Krifka, apply modern tools to Slavic aspect. These approaches are later extended by Schoorlemmer and Filip. We discuss the relevance of these works to Polish in the following chapter.

Chapter 3

Parallelism-Based Approaches

3.1 Introduction

In this chapter we shall be concerned with the post-Chomskian theories of aspect that have had the strongest resonance in Slavic linguistics: we shall discuss ideas of Verkuyl and Krifka, and their later elaboration by Schoorlemmer and Filip. In particular, we shall examine how these Germanically-oriented theories apply to the Polish data.

Our choice for these four approaches is not accidental. We interpret these approaches as crucially incorporating the idea of a parallelism between the Slavic system of aspect and the Germanic system of determiners. We refer to this fundamental idea underlying formal semantical theories of Slavic aspect in the Verkuyl-Krifka approach as the '*parallelism* idea'. In particular, these parallelism-based approaches compare the role of the Slavic perfective aspect marker to the role of the Germanic definite article. Verkuyl and Krifka proposed that the presence of the marker of perfective aspect corresponds to the presence of the definite article, and the absence of the marker of perfective aspect (that is, the presence of imperfective aspect) corresponds to the absence of the definite article in the corresponding Germanic sentences. However, Verkuyl and Krifka only sketched some general lines along which the semantics of Slavic aspect might be analysed. It was Schoorlemmer who worked out some of Verkuyl's ideas for Russian, and Filip who worked out some of Krifka's ideas for Czech. Schoorlemmer and Filip, independently, and on the basis of basically the same data, criticised the application of the parallelism idea to the domain of imperfective aspect. But they did maintain the parallelism idea for the description of perfective aspect.

In this chapter we shall argue that the empirical data from Polish does not support an application of the parallelism idea to the domain of perfective aspect either.

The chapter is structured as follows. In Section 3.2 we introduce the parallelism idea. In Section 3.3 we first introduce some elementary concepts of Verkuyl's theory, and then we discuss Verkuyl's proposal for Slavic. In Section 3.4 we consider Schoorlemmer's work on Slavic aspect, which represents an elaboration of Verkuyl's ideas

about Slavic aspect. In Section 3.5 we provide a brief introduction to the basic concepts of Krifka's theory, and then we discuss their application to Slavic. In Section 3.6 we are concerned with Filip's work on Slavic aspect, which arose from an application of Krifka's theory to the Slavic data. In Section 3.7 we examine the empirical basis of the parallelism-based theories. That is, in Section 3.7.1 we reconsider the data that gave rise to the parallelism idea, and argue that it should be interpreted in a different way than it was proposed in the parallelism-based theories; in Section 3.7.2 we provide additional data that according to us cannot be successfully interpreted within a parallelism-based approach; in Section 3.7.3 we summarize the discussion.

3.2 The parallelism idea

If we stand back and ask ourselves what is the central idea that stands behind the post-Chomskian models of Slavic aspect — what do we find? In our view, the answer is summed up in the following phrase: the '*parallelism* idea'. The parallelism idea fundamentally relates the semantic contribution of the Slavic perfective aspect marker to the information expressed by the Germanic definite article. In this section we introduce the reader to this important idea.

But before we start, a little explanatory remark. Our use of the notion of 'parallelism idea' in the following sections might strike the reader as a bit impressionistic. Indeed, we don't find the parallelism idea defined in a precise way in the literature. For example, Verkuyl hesitates between viewing the perfective prefix as 'acting as' or 'being' a determiner. As he puts it:

In Verkuyl (1993), it was suggested that the perfective prefix is or acts as the determiner of the internal argument — the prefix may be seen as providing the information associated with determiners in non-Slavic languages. (Verkuyl, 1999, page 130)

Filip draws an analogy between aspect markers in Slavic and determiners in Germanic in the following way:

Perfective and imperfective aspectual operators as well as specific verbal affixes stand in a similar relation to the Incremental Theme argument as determiner quantifiers do to the nouns with which they are combined. (Filip, 1993, page 4)

When interpreting concrete data, the perfective prefix is standardly compared to the definite article.

The idea crucially relies on a structural difference between Germanic and Slavic languages. The difference is that Germanic languages do not have morphological markers of imperfective/perfective aspect but they do have definite articles; Slavic languages, on the other hand, encode the 'perfective/imperfective' distinction morphologically, but they do not have articles (only Bulgarian has a definite article).

The parallelism idea arose on the basis of, and is applicable to, a pair of imperfective and perfective sentences containing a mass noun or a bare plural direct object. A standard type of example is the opposition between the imperfective sentence *Jan pił wino* ‘Jan drank-impf wine’ and its perfective equivalent *Jan wypił wino* ‘Jan drank-perf wine’. Essentially, the idea stands on the meaning assigned to these sentences — in particular, the meaning of the mass noun direct object of the perfective sentence. According to the parallelism-based approaches, native speakers interpret the direct object *wino* ‘wine’ in the perfective sentence as referring to a specified quantity of wine which can be identified by speaker and hearer in the discourse context. This interpretation is contrasted with the interpretation assigned to the overtly identical direct object *wino* ‘wine’ in the imperfective sentence, which is claimed to refer to an unspecified amount of wine, not identifiable in the discourse context (Verkuyl, 1999, page 129). Since such an interpretational difference between objects would in Germanic languages be captured by the presence or absence of the definite article, the Germanically-inspired theories claim that the imperfective sentence should be translated into English as ‘Jan drank wine’, and the corresponding perfective sentence as ‘Jan drank the wine (up)’. On the basis of these translations they postulate the parallelism idea: the presence of the marker of perfective aspect in a Slavic sentence corresponds to the presence of the definite article in an equivalent Germanic sentence; and by contrast, the absence of the marker of perfective aspect in a Slavic sentence (that is, the presence of imperfective aspect) corresponds to the absence of the definite article in an equivalent Germanic sentence. Hence the parallelism-based approaches claim that the semantic contribution of perfective aspect can be explained in terms of the semantic contribution of the definite article.

Deriving the parallelism idea on the basis of the particular interpretation of the pair of Slavic sentences is an attractive move in the light of the generally accepted analysis of the proposed English equivalent sentences ‘Jan drank wine’ and ‘Jan drank the wine (up)’. Since Verkuyl and Krifka, these two sentences are namely typically used in the Western formal semantical literature as an illustration of an aspectual opposition: ‘Jan drank wine’ is analysed as atelic/aterminative/imperfective (these terms are used interchangeably), and ‘Jan drank the wine’ is analysed as telic/terminative/perfective.

Schoorlemmer who worked out some of Verkuyl’s ideas for Russian, and Filip who applied Krifka’s theory to Czech, both independently arrived at the conclusion that a parallelism-based approach to the imperfective aspect cannot be maintained for Slavic. The crucial data that Schoorlemmer and Filip used to criticise a Verkuyl-Krifka-style approach to imperfective aspect is represented by an imperfective sentence with a count noun direct object, such as for instance *Jan pisał list* ‘Jan wrote-impf letter’. Schoorlemmer observed that under Verkuyl’s assumption that an imperfective verb combines with a [-SQA]-direct object, the count noun direct object *list* ‘letter’ in the imperfective sentence *Jan pisał list* ‘Jan wrote-impf letter’ should be analysed as [-SQA]. According to Verkuyl’s definition of the notion of [SQA] though, a count noun direct object is clearly [+SQA]. Filip made an analogous observation with respect to Krifka’s theory. She observed that Krifka’s assumption that an imperfective operator is applicable to atelic expressions only, predicts that a count noun direct object of an

imperfective verb is cumulative, since an atelic expression requires a cumulative object. However, on the other hand, this prediction is in conflict with Krifka's definition of cumulativity, since count nouns are clearly quantized.

Nonetheless, neither Schoorlemmer nor Filip seem to have really broken with the parallelism-based approach to the imperfective aspect. As we shall see below, Schoorlemmer argues that Verkuyl's system applies to a (quite large indeed) fragment of Russian, and Filip still explains the semantics of an imperfective sentence by linking it to the absence of the definite article in the Germanic equivalent of the Slavic sentence.

So far we have given a brief overview of the parallelism-based approaches of Verkuyl, Schoorlemmer, Krifka and Filip. Let's now examine how these theories apply to the Polish data.

3.3 The theory of Verkuyl

In this section we introduce elementary notions of Verkuyl's aspectual theory, and discuss Verkuyl's proposal for Slavic aspect. Verkuyl (1972) relates his study of aspectuality to work on aspect done in the traditional aspectology. He makes a positive connection between his ideas and the ideas of the Germanic researchers such as Streitberg or Poutsma. On the other hand, he strongly rejects the traditional Slavic position that aspect is a category of (Slavic) verb.

In Section 3.3.1 we outline the main ideas of Verkuyl's theory of aspect. In Section 3.3.2 we present Verkuyl's approach to Slavic aspect. In Section 3.3.3 we focus on the data that Verkuyl uses as the empirical basis for his view on Slavic aspect. In Section 3.3.4 we discuss problems of the empirical basis of Verkuyl's proposal for Slavic. In Section 3.3.5 we conclude.

3.3.1 General introduction to Verkuyl

Verkuyl (1972, 1993) conceives of 'aspect' as a sentential category, which he defines in terms of a binary opposition between 'terminativity' and 'aterminativity'. A sentence is terminative if it can combine with the 'in (*x time*)' adverbial, and it is aterminative if it combines with 'for (*x time*)'. Verkuyl (1972, 1999) relates his conception of aspect to the traditional view(s), and argues that his terminativity/aterminativity opposition applies to the same sort of semantic distinctions as the Slavic perfective/imperfective opposition. Hence he applies 'in (*x time*)' adverbials as a test for aspectual character of the Germanic and the Slavic sentences.

According to Verkuyl, aspect is a sentential property composed from relevant information encoded in the verb and its arguments. The aspectual contribution of the verb is captured by means of the lexical feature '[ADD TO]', and the relevant nominal information is expressed by the structural notion of '[SQA]'. '[ADD TO]' pertains to such semantic distinctions as 'additivity', 'dynamicity', 'progress in time', and so it has a positive value in the case of non-stative verbs. For example, *to dance*, *to read*, *to discover* are [+ADD TO]. The nominal feature '[SQA]' (that is, 'Specified Quantity of

A', where 'A' stands for the set denoted by the nominal argument) amounts to the cardinality information within the noun phrase, and so it has a positive value in the case of noun phrases that encode quantificational information. For example, noun phrases such as *a glass of wine*, *three cats*, *the man*, *some people* are [+SQA]. The combination of these features yields terminativity ([+T]) or aterminativity ([-T]) at the level of verb phrase and sentence. The observation that terminativity/aterminativity can only be established at the level of verb phrase, and that it does not apply at a lower level than the level of verb phrase, is of crucial importance for Verkuyl's notion of compositionality.

The [ADD TO] and [SQA] features are composed in an asymmetrical way: first, the [+/-ADD TO]-verb combines with the [+/-SQA]-internal argument to derive a [+/-T]-verb phrase; second, the [+/-T]-verb phrase combines with the [+/-SQA]-external argument to yield a [+/-T]-sentence.

The composition of the features is governed by the 'Plus'-principle, which states that a verb phrase/sentence is terminative only if all the features have a 'plus' value. The role of the principle is illustrated in (1), Verkuyl's examples (37)-(39) (Verkuyl, 1993, page 15).

- (1) a. They ate sandwiches
 b. They ate three sandwiches
 c. They ate a sandwich

Sentences in (1) led Verkuyl to the thesis that aspectuality of terminative sentences is compositionally formed. According to Verkuyl, the aspectual difference between these sentences stems from the difference between internal arguments. As he puts it:

This set of data led to the thesis that the aspectuality of the terminative sentences is compositionally formed. The line of argument is that *eat* being constant in (37)-(39) [that is, our examples in (1)], the aspectual difference between these sentences must be attributed to a difference between the NPs *sandwiches*, *three sandwiches* and *a sandwich*. This difference was explained in terms of quantification and the delimitation of mass: *sandwiches* in (37) [that is, our (1-a)] pertains to an Unspecified Quantity of sandwiches, *three sandwiches* in (38) [that is, our (1-b)] and *a sandwich* in (39) [that is, our (1-c)] to a Specified Quantity of sandwiches. (Verkuyl, 1993, page 16)

A useful analogy urges itself upon us to express the idea of compositionality. Terminative aspect can be seen as a molecule built up from the atoms [+ADD TO] and [+SQA]. The terminative molecule, [+T], in sentences like (64) *Judith ate three sandwiches* is a 'triple-atom' molecule, as represented in (65a):

(65) a. Judith ate three sandwiches [+SQA][+ADD TO][+SQA]=[+T]

...

Only if all atomic features are positive, as in (65), can the composite molecular feature be [+T]. That is, only (65a) has terminative aspect, all molecules with one or more minus features being durative. As long as features will be used to speak about aspectual composition, I will use the term *Plus-principle* to refer to the requirement that all aspectual ‘atoms’ involved are plus-values. Of course, one is to present more than metaphors, however useful these may be to reveal underlying assumptions.

One way to get to more standard expressions is to see (65) as a sort of semantic feature algebra, which serves as a point of departure. (Verkuyl, 1993, page 20)

Being just a point of departure, the feature algebra is a valuable and a convenient device to compute the semantic value of an expression (Verkuyl, 1993, page 17, 22). As he puts it:

The basic idea of aspectual compositionality was and still is that only a combination of a [+ADD TO]-verb with one or more of its argument [+SQA]-NPs yields a compositionally formed (and hence semantic) terminative inner aspect. (Verkuyl, 1993, page 17)

As might have become clear from what we’ve said so far, the central role within Verkuyl’s compositional system is played by the notion of verb phrase — the level at which terminativity/aterminativity can be established in Germanic. Verkuyl introduces the notion of ‘path’ to conceptualize the internal structure of the verb phrase; the notion of ‘path function’ represents the process of aspectual composition (Verkuyl, 1993, page 215-241). The notion of path is informally explained as ‘the fusion of temporal and atemporal structure which can be bounded (terminative) or unbounded (durative)’, in the sense that ‘the verb induces temporal structure to which the information associated with its complement systematically relates’ (Verkuyl, 1993, page 215). The notion of the path function can be informally explained as mapping the atemporal structure to the temporal structure.

The atemporal structure is the set denoted by the internal argument, and the temporal structure is the ordered set of indices created by the [+ADD TO]-verb; the [+ADD TO]-verb is viewed as the ‘successor’ function, providing for a point of time its successor. The path function, by mapping the subsets of the set denoted by the internal argument to the ordered set of indices, creates a path: that is, a set of spatio-temporal locations. The external argument is thought of as a theme traversing that path.

The partitions of the set denoted by the internal argument are the input for the path function. At the moment at which the whole set denoted by the internal argument has been mapped to the indices, the path function has no more input, and it stops; and so the successor function creating the indices stops as well. That means that only the internal argument noun phrase that encodes a specified quantity information can bring the path function, and thus the progress in time, to a stop; (the feature algebra

preliminarily captures this assumption by stating that only a [+SQA]-direct object can bring the progress in time expressed by a [+ADD TO]-verb to a stop, and make a verb phrase [+T]). Verkuyl writes:

Terminativity can be expressed in terms of a function having a finite domain or co-domain; roughly, a mapping ‘goes through’ its domain and stops if there are no values available. (Verkuyl, 1993, page 229)

Having some basic understanding of Verkuyl’s compositional theory of aspect, let us now consider Verkuyl’s proposal for Slavic.

3.3.2 Verkuyl on Slavic

As we’ve said, Verkuyl (1972, 1999) relates his theory of aspect to some ideas from traditional aspectology; and in particular, he objects against the Slavic position that Slavic aspect is a verbal category. Verkuyl summarizes the traditional Slavic conception of aspect as ‘characterized by the tendency to regard perfectivity and imperfectivity as a morphological-semantic phenomenon restricted to Slavic languages’, and as ‘the position, in which aspect is seen as exclusively a matter of verb morphology’, and in which ‘the burden of the account for the aspectual difference is put on a semantic characterization of the morphemes involved in bringing about the opposition between perfectivity and imperfectivity, in a combinatorial fashion’ (Verkuyl, 1999, page 119).

The crucial argument that Verkuyl uses against the traditional Slavic position that aspect is a ‘morphological-semantic phenomenon’ consists in his claim that the aspectual markers induce syntactic dependencies. As he puts it:

... the presence or absence of certain prefixes give away dependencies that should be accounted for syntactically rather than morphologically (in the traditional sense). (Verkuyl, 1999, page 107)

In particular, Verkuyl argues that there is a dependency between the presence of the perfective prefix and the sort of internal argument that the verb containing such a prefix may take. As we shall see in the next section, Verkuyl argues that a perfective verb is compatible with a [+SQA]-direct object, and incompatible with a [-SQA]-direct object. He interprets this observation as showing that the perfective prefix in Slavic relates to the [+SQA]-specification within a Germanic noun phrase. This leads him to conclude that the internal argument plays an active role in the process of aspectual composition in Slavic. And so he argues that aspect in Slavic is not, as the traditional view says, a verbal category, but a category of verb phrase and sentence, as in Germanic; hence Slavic aspect should be analysed compositionally, in a similar way as aspectuality in Germanic.

Given that aspect in Slavic should be analysed compositionally, along the same lines as aspectuality in Germanic, aspect and aspectuality should refer to the same semantic distinctions. Indeed Verkuyl argues that the distinction between Slavic imperfective and perfective aspect closely corresponds to, or overlaps with the distinction between atterminative and terminative aspectuality in Germanic languages. He writes:

I will proceed by adopting this view: in spite of the differences, there is sufficient evidence for a systematic correspondence or overlap between what is expressed via [+T] in Germanic languages and what is expressed by [+P] in Slavic languages. (Verkuyl, 1999, page 128)

Verkuyl discusses this assumption by trying to apply the feature algebra to the Slavic data (Verkuyl, 1999, page 125-128). His attempt at applying the feature algebra to the Slavic data encounters several problems. In spite of the open questions that his discussion reveals, Verkuyl concludes that the feature algebra is necessary to account for Slavic data. As he puts it:

Again, the features ... are not sufficient to explain the Slavic data, although there is clear evidence that they are necessary. (Verkuyl, 1999, page 127)

In the next sections we shall present and discuss the empirical data that leads Verkuyl to the conclusion that the semantics of the perfective prefix should be accounted for syntactically, and not morphologically.

3.3.3 Data and interpretation

In this section we consider the data that Verkuyl interprets as revealing a dependency between the presence of the perfective prefix and the [+SQA]-nature of the internal argument. As the reader may recall from the previous section, on the basis of the existence of such a dependency, Verkuyl assumes that the Germanic terminativity closely corresponds to or overlaps with the Slavic perfectivity, and so it can be accounted for with the help of basically the same compositional machinery.

Consider the sentences in (2):

- (2) a. Maria czytała
Maria read-impf
b. *Maria przeczytała
Maria read-pf

Formally speaking, (2-a) and (2-b) differ only in that (2-a) contains an imperfective verb, and (2-b) contains a perfective verb. However, (2-a) is considered as a grammatical and (2-b) as an ungrammatical construction. From this grammaticality judgment Verkuyl concludes that the perfective verb always needs to be accompanied by the direct object, which suggests that the perfective verb 'needs to have available specific information about the internal argument' (Verkuyl, 1999, page 108).

Verkuyl develops his line of thought on the basis of the sentences in (3):

- (3) a. Jan czytał literaturę piękną
Jan read-impf (the) belles lettres
b. *Jan przeczytał literaturę piękną
Jan read-pf (the) belles lettres

Verkuyl assumes that the direct object *literaturę piękną* ‘(the) belles lettres’ in these two sentences is inherently [-SQA], which means that ‘it is impossible to delimit the denotation of (the) *belles lettres* in a sensible way’ (Verkuyl, 1999, page 108). Verkuyl argues that the fact that the imperfective sentence (3-a) is grammatical but its perfective equivalent (3-b) is not, suggests that the perfective verb requires an argument whose quantity is specified. As he puts it:

... the presence of a perfective prefix requires a specific interpretation of the internal argument. (Verkuyl, 1999, page 108)

Verkuyl argues that the perfective prefix imposes, if possible, the required [+SQA]-interpretation on the internal argument. In particular, if the direct object is a mass noun or a bare plural, the perfective prefix imposes on it the necessary [+SQA]-interpretation. Verkuyl argues in favour of this view on the basis of the pairs of sentences in (4) and (5). We quote Verkuyl’s examples and translations (Verkuyl, 1999, page 108; 116; 118); compare also (Verkuyl, 1993, page 27).

- (4) a. Ivan pil pivo
Ivan drank-impf beer
‘Ivan was drinking/drank beer’
b. Ivan vypil pivo
Ivan drank-pf beer
‘Ivan drank the beer’
- (5) a. Ivan čital stixotvorenija
Ivan read-impf poems
‘Ivan has read poems’
b. Ivan pročital stixotvorenija
Ivan read-pf poems
‘Ivan has read the poems’

Verkuyl says:

The two sentences in (22) [that is, our (5)] are wellformed but they clearly differ in meaning: (22a) [that is, our (5-a)] says that Ivan has read an unspecified quantity of poems, whereas (22b) [that is, our (5-b)] restricts the quantity of poems. People involved in the conversation were talking about poems and (22b) [that is, our (5-b)] refers back to the poems being discussed, or some other contextual clue is present to delimit the set of poems. (Verkuyl, 1999, page 108)

Similarly, the direct object of (4-b) is described as referring to a contextually identifiable quantity of beer (Verkuyl, 1999, page 118, 129). As he puts it:

It [that is, *pivo* ‘beer’ in (4-b)] must be taken as pertaining to a contextually identified quantity of beer. (Verkuyl, 1999, page 118)

... a [-SQA]-specification of the internal argument *pivo* is untenable. Russian speakers assign a terminative interpretation to (16b) [that is, our (4-b)]: it means that Ivan drank *the* beer, that is, some quantity of beer already identified in the preceding discourse. (Verkuyl, 1999, page 129)

Verkuyl argues that the interpretational difference between (4-a) and (4-b), as well as between (5-a) and (5-b), should be attributed to the presence or absence of perfective prefix (since this is the only visible difference between the sentences). The difference is mirrored by the absence or presence of the definite article in the English translation.

The interpretation of the data, as we just presented it, leads Verkuyl to the conclusion that the perfective prefix semantically relates to the internal argument, and so its workings should be accounted for syntactically, and not morphologically. On the basis of this conclusion, Verkuyl argues against the traditional method of accounting for the semantics of an affix within the domain of the word whose stem the affix is added to (Verkuyl, 1999, page 107f., etc.).

But Verkuyl does not aim at elaborating on his ideas about the role of the perfective prefix:

It should be underlined here that for the point to be made, a precise syntactic or morphological analysis is not necessary here. (Verkuyl, 1999, page 109)

It is Schoorlemmer who applies Verkuyl's compositional theory to Russian aspect, and we shall discuss her work in Section 3.4.

3.3.4 Empirical problems

In this section we present some problems with Verkuyl's interpretation of the empirical data presented in the previous section. As we said at the beginning of that section, it is this interpretation that Verkuyl's theory (and indeed any parallelism-based theory) is designed to account for.

Concerning the pair of sentences (2-a) and (2-b), one could have reservations with respect to the contrasting grammaticality judgment assumed by Verkuyl. If an appropriate context is provided, both sentences can be used without a direct object. For instance, *Marta napisała do Piotra* 'Marta wrote-perf to Piotr', *dziękuję że napisałaś* 'thanks that you wrote-perf' (opening of a letter) are perfectly fine. One can also perfectivise the verb *pisać* by prefixing it by *po-*, and the resulting perfective sentence *Marta popisała* is as good as the imperfective sentence (2-a). More examples of this type are given in Section 3.7.2.

Verkuyl explains the grammaticality of the imperfective sentence (3-a) and the ungrammaticality of its perfective equivalent (3-b) in terms of the quantificational nature of the object. In particular, he argues that *literaturę piękną* '(the) belles lettres' is inherently [-SQA], and so it cannot combine with a perfective verb. It seems that

Verkuyl's description of the contrast between (3-a) and (3-b) overlooks a crucial difference between the two sentences: namely, the fact that the imperfective sentence (3-a) is correct only if it is given a habitual interpretation — a progressive reading of (3-a) is not available. That is, *Jan czytał literaturę piękną* 'Jan read-impf (the) belles lettres' is out if it is interpreted as 'Jan was reading (the) belles lettres', and it is acceptable only if it is interpreted as 'Jan used to read (the) belles lettres'. We cannot offer an explanation of these facts here, but we would like to suggest that these facts are quite likely to be successfully explained along the lines of Delfitto (2002).¹ To give the reader a hint of an explanation of the ungrammaticality of (3-b), we would like to point out that *literaturę piękną* '(the) belles lettres' is a kind-level expression, and so it cannot occur in an episodic sentence; that means, it cannot occur in both an imperfective sentence referring to a single event in progress and a perfective sentence denoting a single completed event. This results in ungrammaticality of (3-b), and the blocking of a progressive reading of (3-a).

The pairs of sentences such as (4-a)/ (4-b) and (5-a)/ (5-b) are central to all Germanically-oriented theories of Slavic aspect (the reader may recall from Section 3.2 that they gave rise to the parallelism idea). Verkuyl says that native speakers of Slavic interpret the objects of the perfective sentences (4-b) and (5-b) as [+SQA]/definite and the objects of the corresponding imperfective sentences (4-a) and (5-a) as [-SQA]/indefinite. On the basis of this interpretation Verkuyl proposes that the perfective prefix requires a [+SQA]-direct object, and so its role can be compared to the role of the definite article. In Sections 3.7.1 and 3.7.2 we shall argue that a mass noun or a bare plural direct object can, and indeed most naturally is interpreted as [-SQA] (which means that we shall argue in favour of the interpretation that Verkuyl called 'untenable' when discussing (4-b)). In contrast to Verkuyl, we shall argue in favour of the view that there is no systematic difference as to the the [SQA]-nature of the objects in pairs of sentences such as (5-a)/ (5-b), or (4-a)/ (4-b).

3.3.5 Summary

Verkuyl argues that Slavic aspect is a property of verb phrase, and not of verb, as traditional (mostly Slavic) scholars have argued. Hence Slavic aspect should be accounted for within a compositional system, analogously to the Germanic aspectuality. The argument that Verkuyl presents in favour of this view is his observation that the perfective prefix acts as a determiner on the direct object, which suggests that the direct object is involved in the process of aspectual composition. We discussed the empirical data that Verkuyl interprets as revealing such a dependency between the perfective prefix and the direct object, and we pointed out several problems of Verkuyl's interpretation of the data; in Sections 3.7.1 and 3.7.2 we shall provide further empirical arguments against the view that the role of the perfective prefix can be successfully analysed in terms of the role of the definite article.

¹ Delfitto (2002) explored some ideas expressed in Carlson (1977). Similar ideas arose independently in Eastern Europe. The research there was initiated by Koseska (1970) and developed by her in much subsequent work; see for instance Koseska-Toszewa (1982).

We turn now to the work on aspect by Schoorlemmer (1995, 1997) who applied Verkuyl's theory to Slavic (in particular, Russian), and worked out some of his ideas.

3.4 The theory of Schoorlemmer

In this section we present and discuss work on Russian aspect by Schoorlemmer (1995, 1997), who elaborates on Verkuyl's ideas. Schoorlemmer defines aspect as a sentential property, and specifies the fragment of Russian to which she argues Verkuyl's theory is applicable.

In Section 3.4.1 we introduce the reader to the basic ideas of Schoorlemmer's theory of aspect. In Section 3.4.2 we present Schoorlemmer's approach to 'The Null Hypothesis'. This hypothesis states that atelic expressions are imperfective and telic expressions are perfective, and in this sense it sums up Verkuyl's parallelism-based approach to Slavic. By checking the null hypothesis against Slavic data, Schoorlemmer arrives at her ultimate proposal. In Section 3.4.3 we present Schoorlemmer's argument in favour of a Verkuylian analysis of a fragment of Russian, and in Section 3.4.4 we discuss some problems with that argument. We conclude in Section 3.4.5.

3.4.1 General introduction to Schoorlemmer

Schoorlemmer (1995) describes 'aspect' as 'the phenomenon in language that sentences differ as to the presence of an inherent end-point as part of their meaning'. Aspect, understood in this general way, can be expressed in different ways by different languages. In Germanic languages, for instance, it is the lexical properties of the verb in combination with quantificational properties of the internal argument that determine the value of aspect. In Russian, on the other hand, aspect is realized by grammatical means: in particular, by perfective and imperfective verbs. As she puts it:

Russian has a grammatical category also generally referred to as 'aspect', in other words it has grammatical means (so-called 'perfective' and 'imperfective' verbs) to express the presence or absence of an inherent end-point in the clause interpretation. (Schoorlemmer, 1995, page 77)

The reader should note the "so-called" in the above quotation, which gives a sense of complication to come. In Schoorlemmer's view namely, not all verbs that are typically referred to as perfective or imperfective actually *are* perfective or imperfective, respectively. If a sentence contains a verb that actually is not perfective or imperfective, it is the quantificational nature of the internal argument that is responsible for establishing its aspectual value. The division of Russian verbs into a class that is marked for aspect and a class that is not, plays a crucial role in Schoorlemmer's theory. So let's introduce it at the very start.

Schoorlemmer divides Russian verbs into two classes: 'paired' verbs (that is, verbs forming aspectual pairs) and 'unpaired' verbs (that is, 'Aktionsart' verbs) (Schoorlemmer, 1995, page 98). The distinction between the verbs forming aspectual pairs

and those forming Aktionsarten can be thought of as a distinction between ‘sentence aspect’ and ‘lexical aspect’, or as an opposition between ‘aspectuality’ and ‘Aktionsart’ (Schoorlemmer, 1995, page 96).

There are two sorts of paired verbs. First, simple (imperfective) verbs and (perfective) verbs derived from them by means of empty prefixes: for instance, *pisat* ‘to write-imp’ and *napisat* ‘to write-pf’. Second, simple and prefixised (perfective) verbs and (imperfective) verbs derived from them by means of secondary imperfectivisation: for instance, *izvinit* ‘to forgive-pf’ and *izvinjat* ‘to forgive-imp’. In Schoorlemmer’s view, paired verbs are aspectually neutral lexemes — that is, they are not marked as perfective or imperfective: ‘paired verbs are not lexically marked for aspect’ (Schoorlemmer, 1995, page 108). According to Schoorlemmer, the assumption that these verbs do not encode the perfective/imperfective distinction explains why these verbs form aspectual pairs:

If aspect were a lexical feature there seems to be no reason why it should derive pairs of verbs that only differ in aspect value. The assumption that aspect is a syntactic phenomenon does account for the formation of aspectual pairs with such verbs. (Schoorlemmer, 1995, page 88).

Since paired verbs are analysed as aspectually neutral lexemes, the aspectual value of a sentence containing a verb of this class is established on the basis of quantificational properties of the object: if the object is [+SQA], the sentence is telic and perfective; if the object is [-SQA], the sentence is atelic and imperfective.

Unpaired verbs are also called ‘Aktionsart’ verbs. Since these verbs encode the perfective/imperfective distinction ‘lexically’, they do not form aspectual pairs. The following sorts of verbs belong to this class. First, verbs containing the delimitative prefix *po-*, which Schoorlemmer views as expressing the meaning ‘for a while’: for instance, *popisat* ‘to write-pf’ (‘for a while’). Second, verbs containing the prefix *pro-* that according to Schoorlemmer contains a meaning component ‘long’: for instance, *prospat* ‘to sleep-pf through’ (‘long’). Third, prefixised verbs (for instance, with the prefix *za-*) which mark the beginning point of an event: for instance, *zaigrat* ‘to play-pf’ (‘to start to play’). And fourth, the so-called semelfactive verbs that Schoorlemmer interprets as containing the element ‘once’: for instance, *svistnut* ‘to whistle-pf’.² Schoorlemmer argues that since these verbs are lexically marked for aspect, they also determine the aspect value of a sentence containing them. In other words, since a verb of this class is inherently perfective (or imperfective), the aspect value of a sentence in which the verb occurs is not dependent on the [SQA]-nature of the object, but completely relies on the aspectual value of this verb.

In order to maintain this view on the Slavic verb system (and in particular, the view that some verbs in Slavic do not encode aspect), it is necessary for Schoorlemmer to define aspect as a property of sentence, and not a property of verb. As she puts it:

²The reader should note that these verbs are Russian verbs, and corresponding Polish verbs do not behave in the same way as the verbs described by Schoorlemmer. For instance, the Polish verb *przespać*, corresponding to the Russian *prospat* can be secondarily imperfectivised, and it does not seem to include the meaning element ‘long’; the Polish verb *zagrać*, corresponding to the Russian *zaigrat* cannot be correctly described as referring to the initial point of the event.

... aspect is a grammatical category in Russian. It is a property of sentences which relates interpretation and morphology. (Schoorlemmer, 1995, page 87)

Schoorlemmer analyses Slavic aspect in a way similar to how tense is analysed within a generative framework. She works out her ideas in the generative syntactic framework of Tenny (1987) and Borer (1993).

The proposal is then that the syntactic structure contains a functional category AspP whose head Asp₀ has a feature value [+pf] or [-pf] partially depending on the syntactic context. (Schoorlemmer, 1995, page 87)

The goal of Schoorlemmer's study is to determine how the aspectual feature of the Russian sentence is derived — and in particular, to what extent it is determined by the lexical properties of verb, and to what extent it is established compositionally, along the lines proposed by Verkuyl.

In order to be able to show how the aspect value is determined, Schoorlemmer argues it is necessary to distinguish between 'aspectuality' and 'aspect' in the strict sense. Viewed in this strict way, 'aspect' amounts to the distinction between perfectivity and imperfectivity, and 'aspectuality' pertains to the distinction between telicity and atelicity.

... the presence or absence of an inherent end-point will be referred to as *telic* vs. *atelic aspectuality*; the expression of one by grammatical means as *perfective* vs. *imperfective aspect*. (Schoorlemmer, 1995, page 77)

The distinction between aspect and aspectuality corresponds to the distinction between the two ways of deriving aspect value of a sentence — in particular, the notion of 'aspectuality' pertains to the compositional way of deriving aspect value.

One obvious reason why these two should be distinguished is the observation that in Russian the presence or absence of inherent end-point does not always correspond to the distinction between perfective and imperfective verbs:

... it is not enough to know whether a clause expresses an inherent end-point in order to know whether the verb will be perfective or imperfective. (Schoorlemmer, 1995, page 77)

3.4.2 Testing the null hypothesis

One of the goals of Schoorlemmer's work on aspect is to delimit the fragment of Russian to which Verkuyl's compositional system can be applied. She takes Verkuyl's compositional approach as a starting point, and by checking it against Russian data, she specifies its limitations. In that way, she determines the domain of application of Verkuyl's compositional system to Russian, and arrives at her ultimate proposal: the 'compositionality last resort' proposal.

According to Schoorlemmer, the theory of Verkuyl is a theory of aspectuality, and not aspect. In order to be able to apply Verkuyl's theory of aspectuality to Russian aspectual system, there must be assumed a link between aspectuality and aspect — Schoorlemmer captures this link in terms of a preliminary assumption called the null hypothesis. The null hypothesis states that the link between aspect and aspectuality is such that 'telic clauses are expressed with a perfective verb, and atelic ones with an imperfective verb' (Schoorlemmer, 1995, page 78). As she puts it:

Under the null hypothesis concerning the matching of aspectuality and grammatical aspect in Russian compositional aspect directly derives the value for grammatical aspect: telic clauses will be perfective, atelic clauses will be imperfective. (Schoorlemmer, 1995, page 107)

Since telicity of a verb phrase stems from the [+SQA]-value of the direct object, the null hypothesis directly corresponds to the parallelism idea. Schoorlemmer checks the null hypothesis against the Russian data, and by doing so she specifies the domain of application of Verkuyl's compositional theory to Russian.

The first problem for the null hypothesis are imperfective sentences which nevertheless are telic due to the fact that the internal argument is [+SQA]: that is, 'sentences that contain imperfective verbs despite their apparent telicity' (Schoorlemmer, 1995, page 130). The existence of such sentences motivates Schoorlemmer's view that aspect and aspectuality are not identical. In order to account for this insight, Schoorlemmer postulates a preliminary system of 'double compositionality'.

The double compositionality system incorporates two subsystems: one deriving aspectuality, another deriving aspect; both aspectuality and aspect are derived compositionally (Schoorlemmer, 1995, page 109, 125, etc.). A characteristic property of this system is that it is Germanically-oriented in the sense that the category of aspectuality is obligatory, and so (im)perfectivity is always translated into (a)telicity. So for example, the Aktionsart verbs that according to Schoorlemmer are inherently perfective, are re-defined as inherently telic.

Schoorlemmer identifies several problems for the double compositionality system (Schoorlemmer, 1995, page 127). The crucial problem from which all the concrete problems derive is the observation that in contrast to aspect, aspectuality is not always defined in Russian. In consequence, it may be impossible to determine whether a sentence is telic or atelic. This is the case with the so-called 'imperfective triggers': habitual sentences, sentences with 'telic presupposition' (that is, imperfective sentences on the 'factive' reading; see 3.7), and negated sentences. Another problem for the double compositionality system is posed by verbs that are lexically marked for aspect: Schoorlemmer's Aktionsart verbs. Schoorlemmer argues that it is unnatural to re-define an inherent marking for perfectivity in terms of inherent marking for telicity. Moreover, a closer look at Aktionsart verbs reveals that they would need to be analysed differently within the two subparts of the double compositionality system (Schoorlemmer, 1995, page 127). In addition, Schoorlemmer argues that the Germanically-inspired system of double compositionality is unintuitive and untransparent:

So far, our reasoning took as a starting point the aspectual properties of languages like English, and looked at ways of matching these to a language like Russian. The system arrived at in this way is conceptually very ugly. (Schoorlemmer, 1995, page 128)

On the basis of its disadvantages, Schoorlemmer abandons the double compositionality system. She proposes the ‘compositionality last resort’ system instead. She characterizes her ultimate proposal as follows:

Compositionality aspectuality is proposed to be relevant only in clauses that do not have any direct perfective or imperfective triggers. (Schoorlemmer, 1995, page 130)

The direct perfective triggers are Schoorlemmer’s Aktionsart verbs, and the direct imperfective triggers are habitual, factive (in her terms, ‘sentences with telic presupposition’) and negated sentences.

So the compositionality last resort system says that a Verkuylian compositionality system is operative within the fragment of Russian consisting of verbs which are not marked for aspect. Sentences containing these verbs are thought of as deriving their aspectual value from syntactic factors — in particular, from the quantificational nature of the internal argument.

Schoorlemmer argues that within this fragment of Russian the null hypothesis is left intact, and is valid. To spell this out, within the fragment of Russian consisting of verbs which do not encode the perfective/imperfective distinction, telic aspectuality is directly mapped to perfective aspect, and atelic aspectuality is directly mapped to imperfective aspect. Whether the sentence is telic or atelic, depends on the nature of the argument: if the internal argument is [+SQA], the verb phrase is telic, if the internal argument is [-SQA], the verb phrase is atelic. Outside of the fragment of Russian containing verbs of this group, the null hypothesis is not valid, and the compositionality system is ‘switched off’. Schoorlemmer argues that aspectuality is undefined for expressions containing verbs that are marked for aspect:

Compositionality has nothing to say about the aspectual properties of these verbs. (Schoorlemmer, 1995, page 100)

According to Schoorlemmer, the compositionality last resort system has two main advantages when compared with the double compositionality system. The first advantage concerns the treatment of the null hypothesis. In contrast to the double compositionality system, which modifies the null hypothesis in order to account for the observation that imperfective sentences may be telic, the compositionality last resort system leaves the null hypothesis intact within the fragment of Russian which Schoorlemmer argues should be analysed within a Verkuylian system. The other advantages of the compositionality last resort system, when compared to the double compositionality system, follow from the fact that the compositionality last resort system is not modeled by taking a Germanic language as a starting point. Crucially, the compositionality last resort system predicts that aspect and not aspectuality is the crucial

property of Russian clauses: “aspectuality may be irrelevant or left unspecified, aspect must not be” (Schoorlemmer, 1995, page 130). Accordingly, the compositionality last resort system does not necessarily translate (im)perfectivity into (a)telicity, and so it automatically avoids certain problems that Aktionsart verbs and imperfective triggers pose for the double compositionality system.

The general conclusion that Schoorlemmer draws is the following. Aspect as a general category can be expressed in different languages in different ways. In Germanic languages, the expression of aspect is based on compositional aspectuality that is defined as an opposition between telic and atelic clauses. In Slavic languages, aspect is basically expressed lexically, and it pertains to the distinction between perfective and imperfective verbs and clauses; compositional aspectuality is only a last resort:

In a language like English we see some evidence of a system of *aspect* relying entirely on *aspectuality*. In Russian, *aspect* relies on lexical properties of Aktionsart verbs, the presence of factors like habituality or telic presupposition (imperfective triggers), and on aspectuality as a last resort. The distinction between *perfective* and *imperfective* (verbs, clauses) pertains to *aspect* only. (Schoorlemmer, 1995, page 131)

3.4.3 A Verkuylian analysis in Russian

Schoorlemmer argues that on the null hypothesis assumption, the fragment of Russian consisting of verbs which do not encode aspect, should be accounted for within the compositional system of Verkuyl. In this section we present Schoorlemmer’s argument for a Verkuylian analysis of these verbs.

The Slavic data that according to Schoorlemmer lends itself to a Verkuylian analysis (given that we assume the validity of the null hypothesis) is basically the same type of data that Verkuyl himself uses to support his theory, and which we presented in Section 3.3.3. Schoorlemmer provides three arguments that according to her support a Verkuylian analysis of this data.

The first argument is the claim that ‘the direct objects of telic verbs always have a [+SQA] interpretation’ (Schoorlemmer, 1995, page 97). One of the three sentences that support this claim is (6) (Schoorlemmer’s example (33b); the data as well as the glosses and the translations are Schoorlemmer’s).

- (6) Vasja vypil čaj za čas
 V. drank-pf tea in hour
 ‘Vasja drank the tea in an hour’

The second argument, defended with the data in (7) (Schoorlemmer’s (34)), is the claim that ‘the subject of a transitive verb in a telic expression is also [+SQA], and therefore never has a generic reading’ (Schoorlemmer, 1995, page 98).

- (7) Deti pročitali komiksy za den’
 children read-pf comics in day

- *‘Children read comics in a day’
 ‘The children read the comics in a day’

The last argument for the view that Russian is sensitive to a compositional system is given in the claim that ‘adverbs like *postojanno*, *besprestanno* ‘constantly’ are impossible in telic expressions’. One of the two examples supporting this claim is given in (8) (Schoorlemmer’s (35a)).

- (8) *Vasja postojanno pročital komiksy za den’
 V. constantly read his comics in a day
 ‘Vasja constantly read his comics in a day’

In the next section we shall discuss empirical problems with these three claims.

3.4.4 Empirical problems with a Verkuylian analysis

In Section 3.4.3 we presented three empirical arguments that Schoorlemmer uses in order to support a Verkuylian approach to a fragment of Russian. In this section we discuss her arguments.

Claim one says that the direct object of a perfective verb is compatible only with a [+SQA] direct object. Accordingly, if the direct object is a mass noun, the perfective verb imposes on it the required [+SQA]-interpretation — and this, Schoorlemmer argues following Verkuyl, is reflected by the presence of the definite article in the English translation of such a sentence. This claim expresses an idea that we introduced in Section 3.2 as the parallelism idea. Since the parallelism idea is shared by all the approaches discussed in this chapter, we won’t argue against it here, but we refer the reader to Section 3.7.1 and Section 3.7.2 in which we provide empirical arguments against it.

Claim two says that the generic reading of a subject is blocked by its [+SQA]-interpretation.³ We believe that the blocking of the generic reading should be explained in a different way. It seems to us that the generic reading of (7) is not blocked by the [+SQA]-property of the subject, but by the fact that the perfective sentence (7) is an assertion about a single-episodic event, and sentences referring to single-episodic event cannot have a generic reading. We cannot develop this argument in this thesis, but we would like to suggest that the data could be analysed in the spirit of Delfitto (2002).

Claim three says that ‘adverbs like *postojanno* and *besprestanno* ‘constantly’ are impossible in telic expressions’. Since telicity of the verb phrase is established by the [+SQA]-nature of the direct object, this claim can be interpreted as saying that the

³A note of explanation. According to Schoorlemmer, who believes to follow Verkuyl on that matter, a [+SQA]-interpretation of the subject of a transitive sentence is one of the conditions on telic aspectuality (Schoorlemmer, 1995, page 96). However, Verkuyl argues that the determiner-like effect of the perfective prefix on the direct object is ‘rightward bounded’.

nature of the internal argument can determine adverbial modification. In our opinion, these adverbials (and as a rule, temporal adverbials in Slavic) are applied accordingly to the aspectual value of the verb. In Chapter 5, Section 5.4, we shall show that Slavic verbs in their infinitival form can be modified by certain adverbials and cannot be modified by others. So we believe that in **Vasja postojanno pročital komiksy za den* ‘Vasja constantly read his comics in a day’, *postojanno* ‘constantly’ is not impossible because of the fact that *pročital komiksy* ‘(he) read-perf comics’ is telic (as confirmed by modification by *za den* ‘in a day’) — instead, it is fundamentally impossible to modify the perfective verb *pročital* by the durational adverb *postojanno* ‘constantly’. On the other hand, if the verb were imperfective, the adverb *postojanno* ‘constantly’ could be applied to it: *čital postojanno* ‘(he) read-impf constantly’ is fine. The nature of the internal argument does determine the applicability of the adverbial: **pročital postojanno komiksy/dva komiksa* ‘*(he) read-perf constantly comics/two comics’ is out, and *čital postojanno komiksy/dva komiksa* ‘(he) read-impf constantly comics/two comics’ is fine. But the view that it is the aspect of the verb that determines the selection of the adverbial modification cannot be maintained by Schoorlemmer, since according to her, *pročital* and *čital*, as well as other verbs forming aspectual pairs, do not lexically encode the perfective/imperfective distinction.

Incidentally, if the ‘for/in (x time)’ adverbial test is a test detecting the aspectual character of expressions, the claim that verbs such as *čitat* ‘to read-impf’ and *pročitat* ‘to read-perf’ are not marked for aspect, cannot be maintained. As we mentioned, both verbs, in their infinitival form, clearly select for an appropriate adverbial: *čitat čas* ‘to read-impf for hour’ is fine, but **čitat za čas* ‘to read-impf in hour’ is not; by contrast, **pročitat čas* ‘to read-perf for hour’ is bad, but *pročitat za čas* ‘to read-perf in hour’ is good. Given Schoorlemmer’s argument that Aktionsart verbs cannot be accounted for within a compositional system precisely because they are marked for aspect, it follows that the compositional analysis is not needed in the case of verbs such as *pročitat* and *čitat*. Moreover, whether *pročitat* or *čitat* is accompanied by a [-SQA] or [+SQA] direct object, the selection of the appropriate adverbial still depends on the verb only — exactly as Schoorlemmer argued that it was the case with the Aktionsart verbs. For example, *čitat pis’ma/pis’mo čas* ‘to read-impf letters/letter for hour’, but **čitat pis’ma/pis’mo za čas* ‘to read-impf letters/letter in hour’; *pročitat pis’ma/pis’mo za čas* ‘to read-perf letters/letter in hour’, but **pročitat pis’ma/pis’mo čas* ‘to read-perf letters/letter for hour’.

In our view, the arguments that we have provided are sufficient to motivate our conclusion that Schoorlemmer’s argument used to prove that Verkuyl’s theory is applicable to the particular set of data are not convincing. And if Verkuyl’s theory indeed cannot be applied to the data discussed by Schoorlemmer, as we argue, and Schoorlemmer is right that it cannot apply outside of this fragment of Russian, then Verkuyl’s theory might be inapplicable to Russian.

3.4.5 Summary

We presented Schoorlemmer's work as an elaboration on Verkuyl's ideas about Slavic. The first problem that Schoorlemmer identifies for a Verkuylian analysis of aspect in Russian is posed by imperfective sentences with [+SQA]-direct objects. In order to avoid the problem posed by these sentences, Schoorlemmer proposes the double compositionality system. However, after having examined this system, Schoorlemmer abandons it for the compositionality last resort system, which re-establishes a Verkuylian approach to imperfective aspect within a fragment of Russian.

On the one hand, the compositionality last resort proposal represents a regression in comparison with the double compositionality system: it leaves the Verkuylian compositional system intact, and thus ignores the observation on the basis of which Schoorlemmer first criticised a Verkuylian analysis of the imperfective aspect. On the other hand, it incorporates the insight that a compositional system is not applicable to sentences containing verbs which are marked for aspect.

We agree with Schoorlemmer on her argument that the value of a sentence containing a verb which is marked as perfective or imperfective is determined directly by the aspect of that verb, and not by the quantificational nature of its internal argument. In addition, we believe that not only 'Aktionsart' verbs, but also verbs forming aspectual pairs are marked for aspect, as confirmed by the adverbial test. Accordingly, we believe that the aspectual value of a sentence containing a 'paired' verb is also determined directly by the aspect of this verb, and not by the quantificational nature of its internal argument.

3.5 The theory of Krifka

This section is devoted to Krifka's approach to aspect. The main interest of Krifka's work on aspect lies in the interaction between the verbal and the nominal domain. As far as Slavic aspect is concerned, Krifka proposes to explain the opposition between perfective and imperfective aspect in terms of different quantificational properties of objects.

In Section 3.5.1 we introduce the reader to the fundamental ideas of Krifka's theory. In Section 3.5.2 we present empirical data from Slavic that Krifka aims at explaining. In Section 3.5.3 we discuss problems with Krifka's interpretation of the empirical data. In Section 3.5.4 we conclude.

3.5.1 General introduction to Krifka

One of the main goals of Krifka's work is to describe the semantics of quantity in the verbal domain and its interaction with the semantics of quantity in the nominal domain. Krifka develops a theory of aspect which is based on the idea of a parallelism between the kind of reference of the verbal predicate and the kind of the nominal reference. The 'kind of reference' of the verbal predicate corresponds to the notion of 'Zeitkonstitution'. Krifka defines 'Zeitkonstitution' as 'a semantic distinction in

the domain of verb, which exhibits certain similarities with the distinction mass noun : individual noun in the nominal domain, and which is often called ‘Aktionsart’ or ‘aspect’, and he connects this notion to Isačenko’s (1962) notion of ‘Verbalcharakter’.⁴ Krifka describes the Zeitkonstitution of verbs within the framework of event semantics (Krifka, 1989b, page 95-96).

The central distinction within the verbal domain is that between telicity and atelicity. But the reader should note that Krifka defines the notion of telicity, as it was introduced by Garey (1957), in a new way. According to Garey, telic verbs are ‘verbs expressing an action tending towards a goal envisaged as realized in a perfective tense, but as contingent in an imperfective tense’; atelic verbs, on the other hand, are ‘verbs which do not involve any goal nor endpoint in their semantic structure, but denote actions that ‘are realized as soon as they begin’ (Garey, 1957, page 6). Krifka does refer to Garey (1957) as the source of the distinction between telicity and atelicity, but he re-defines it in terms of the opposition between quantization and cumulativity — that is, in terms of the opposition that he has been using to describe the nominal reference. Quantized (that is, telic) verbal predicates are non-stative verbs, and cumulative (that is, atelic) verbal predicates are stative verbs.

Die Telizität wird in dem vorliegenden Ansatz sinnvollerweise durch die Gequanteltheit erfaßt werden: Ein verbales Prädikat ist telisch, wenn es gequantelt ist. Die Atelizität wird umgekehrt durch die Kumulativität des verbalen Prädikats erfaßt werden. Die nominalen Prädikate *Wein* und *ein Glas Wein* unterscheiden sich ebenfalls darin, daß ersteres kumulativ, letzteres gequantelt ist. (Krifka, 1989b, page 158)

The central idea of Krifka’s theory of aspect is expressed by the ‘Homomorphism Hypothesis’. This hypothesis states that there is a transfer of the referential properties of the verbal argument on the entire verb phrase.

Man kann den Einfluß der Referenzweise der nominalen Ergänzung auf die Zeitkonstitution des Verbs beschreiben als die Übertragung der Referenzweise vom nominalen Prädikat auf den Gesamtausdruck. (Krifka, 1989b, page 158-159)

The transfer of referential properties can take place only if the object is linked to the verb by the thematic relation of ‘gradual patient’ (‘Sukzessive-Patiens’), caught

⁴It should be noted though that Isačenko (1962) introduced the notion of ‘Verbalcharakter’ to refer to the aspectually relevant *lexical* information, and in order to fundamentally distinguish this information from what ‘Aktionsart’ and ‘aspect’ stand for. He understands under the notion of ‘Verbalcharakter’ the ‘lexical basic meaning’ (‘lexikalische Grundbedeutung’) of a particular verb. “Für die richtige Deutung und Klassifizierung der Aktionsarten ist es ferner unerlässlich, die Aktionsartbedeutung grundsätzlich nicht mit der lexikalischen Grundbedeutung, die wir oben als ‘Verbalcharakter’ bezeichnet haben, zu verwechseln. Der Verbalcharakter betrifft ganz allgemeine lexikalische Züge jedes individuellen Verbs. . . . Die Bedeutung der Aktionsart ist demgegenüber eine *zusätzliche* semantische *Modifizierung* eines Ausgangsverbs.” (Isačenko, 1962, page 415)

on as ‘incremental theme’. That is, the transfer of referential properties can take place only if the object denoted by verbal argument can be thought of as undergoing the event denoted by the verb in a *gradual* manner. There are basically two types of objects that can be assigned incremental theme thematic role: the so-called ‘effected’ objects (‘effiziertes Objekt’): that is, objects which are brought into existence by the event denoted by the verb; and the ‘consumed’ objects (‘konsumiertes Objekt’): that is, objects which disappear due to the event described by the verb.

Due to the incremental theme constraint, Krifka’s homomorphism hypothesis expresses that each part of the object corresponds to a specific part of the event. So for example, *drink a glass of wine* is analysed by postulating that every successive swallow of the wine is mapped to a successive moment on the time axis. The event stops at a certain moment of time t , because there is no part of the object anymore to be mapped to a moment t' , following t . That is, within Krifka’s setting, the quantity of the object is thought of as determining the temporal limit of the event.

Krifka remarks that the fact of the disappearance of the object is not as important as the gradual manner in which the disappearance happens. This remark should help accounting for verb phrases such as ‘to read a book’ or ‘to build a house’, where the object does not disappear.

Das Zusammenwirken von Objekt und Ereignis kann man ebenfalls darstellen: das Objekt wird dem Ereignis nach und nach unterworfen und verschwindet dabei. Dabei ist das Verschwinden des Objekts nicht so sehr von Interesse, sondern vielmehr die Art, wie das Ereignis das Objekt erfaßt. (Krifka, 1989b, page 160)

What are the consequences of the object-to-event mapping? Krifka captures the results of the object-to-event mapping in the following way: if the verb is cumulative, the cumulativity of the object leads to cumulativity of the entire expression; if one of the part expressions is quantized, the entire expression is quantized (Krifka, 1989b, page 159-160).

Let us now consider how these ideas can transfer to Slavic languages.

3.5.2 Data and interpretation

The set of Slavic data to which Krifka (1989b) applies his theory is limited to a pair of Czech sentences given in (9) (the German translations are Krifka’s).

- (9) a. Ota pil víno
Ota drank-impf wine
‘Ota drank Wein’
b. Ota vypil víno
Ota drank-pf wine
‘Ota drank den Wein (aus)’

According to Krifka, the crucial semantic difference between the two sentences in (9) concerns the interpretation of the direct object. Krifka says that the object *víno* ‘wine’ in the imperfective sentence (9-a) is interpreted as ‘indefinite (and thus cumulative)’, while an overtly identical object in the equivalent perfective sentence (9-b) is interpreted as ‘definite (and thus quantized)’ (Krifka, 1989b, page 186). However, the only formal difference between the two sentences is that (9-b) contains the perfective prefix *vy-*, and (9-a) does not.

This leads Krifka to conclude that the opposition between imperfective and perfective aspect can be explained by the different interpretation of the object. In particular, imperfective aspect can be explained in terms of the indefinite interpretation of the object, and perfective aspect can be explained in terms of the definite interpretation of the object. Since in the way Krifka puts it, the opposition between definiteness and indefiniteness induces the distinction between quantization and cumulativity, one can describe imperfective aspect in terms of the cumulative reading of the direct object and perfective aspect in terms of a quantized reading thereof (Krifka, 1989b, page 186-187).

Krifka proposes to translate the Czech sentences into German in a way that precisely mirrors the interpretation that he assigns to the Czech sentences. Moreover, he argues that the difference in the interpretation of the objects in the Czech sentences can be made clear on the basis of the German translations that he proposes. Krifka argues that in German, a verbal expression which is explicitly marked as telic and in which the verb and the object are related so that they allow a transfer of referential properties, requires a quantized object: while *Otto trank den Wein aus* and *Otto trank ein Glas Wein aus* are correct, **Otto trank Wein aus* is ungrammatical.

3.5.3 Empirical problems

In this section we merely focus on Krifka’s translation of the Czech prefixed perfective verb *vypít* ‘to drink-perf’ in terms of the German particle verb *austrinken* ‘to drink up’. Since the data that Krifka discusses is fully analogous to the data used by other parallelism-based approaches, the argument against the interpretation that Krifka assigns to the opposition between (9-a) and (9-b) is postponed until Section 3.7.1 and 3.7.2.

The interpretation that Krifka assigns to the Czech sentences is reflected by their German translations. Krifka translates *Ota vypil víno* ‘Ota drank-pf wine’ in (9-b) as ‘Ota trank den Wein (aus)’, and *Ota pil víno* ‘Ota drank-impf wine’ in (9-a) as ‘Ota trank Wein’. In our opinion, these translations are problematic, if the German verb phrase *den Wein austrinken* is taken to mean ‘to drink up the whole (determinate) portion of wine’. The Czech verb phrase *vypít víno* or its Polish equivalent *wypić wino* does not seem to mean ‘to drink up the whole (determinate) portion of wine’, although it can under certain specific circumstances be understood in that way. Instead, the Slavic sentences seem to mean ‘to finish/complete drinking (some) wine’ (‘some’ on the weak interpretation), and the hearer can infer from contextual information that the verb phrase may be understood as saying that the whole amount of wine referred to

by this sentence was drunk up at the moment at which the activity was finished (we explain this point in detail in Section 3.7.1).

Krifka's translation of *Ota vypil víno* 'Ota drank-pf wine' as 'Ota trank den Wein (aus)' and *Ota pil víno* 'Ota drank-impf wine' as 'Ota trank Wein' seems to suggest that the perfective prefix *vy-* corresponds to the particle *aus*. Recall that Krifka explains the contrast between *Otto trank den Wein aus* and *Otto trank ein Glas Wein aus* on the one hand, and **Otto trank Wein aus* on the other, by postulating that the particle verb *austrinken* 'to drink up' requires a quantized object: *der Wein* 'the wine' and *ein Glas Wein* 'a glass of wine' are quantized, but *Wein* 'wine' is cumulative. However, there arises no such contrast in corresponding Polish sentences, in which the perfective verb functions as the equivalent of *austrinken* 'to drink up': not only *Otto wypil to wino* 'Otto drank-perf this wine' and *Otto wypil szklanę wina* 'Otto drank-perf glass wine-GEN', in which the object is clearly quantized, are fine, but *Otto wypil wino* 'Otto drank-perf wine', in which the object is interpreted cumulatively, is fine as well. In Section 3.7.2 we discuss other examples of this type and argue that the particle verbs cannot be correctly treated as equivalents of Slavic prefixed verbs.

The reader may recall from Chapter 2 that at the very beginning of Germanic aspectology, Grimm and Streitberg tried to match Germanic particles and Slavic perfectivising prefixes on a broad scale; they were strongly criticised in the subsequent literature. More recently, Czochralski objected against this strategy (Czochralski, 1975, page 202). Cutting a long story short, prefixes simply are not prepositions: they do not function in the language as free words, as prepositions do; they are bound and not free morphemes. So for example, in contrast to a Germanic particle, a Slavic perfective prefix is a part of the complex verb; no sentential element may intervene between the imperfective basic verb and the perfective prefix. As a result of the different relation between the Slavic imperfective basic verb and the perfective prefix on the one hand, and the Germanic basic verb and the particle on the other, Slavic and Germanic complex verbs are associated with different argument structures. For instance, while *austrinken* 'to drink up' is obligatorily transitive, *wypić* 'to drink-perf' is not. Moreover, perfectivising prefixes in Slavic are aspectual formants deriving aspectual pairs, but Germanic particles are not used to derive aspectual pairs. A description of prefixes in contemporary Polish, and indeed any Slavic language, in terms of prepositions (from which the prefixes developed) seems to result from a confusion between the tasks and insights of the synchronical and historical morphology. In contemporary Polish, the historical origin of prefixes is not intuitively perceived by native speakers. And sometimes, it might be even hard for a linguist not trained in historical linguistics to determine from which preposition a certain prefix developed (some prefixes do not have a (direct) formal correspondent among the prepositions any longer, and only historical investigations can correctly trace back the origin of it).

Krifka uses his interpretation of the German sentences in terms of which he translates the original Czech sentences as an argument supporting his explanation of the Czech data. This strategy would be justified if the German translations would be perfect translations of the Czech sentences. But perfect translations are rather hard to find, and this one is not an exception.

3.5.4 Summary

We presented Krifka's proposal concerning Slavic aspect as an attempt at explaining the semantic difference between Slavic perfective and imperfective aspect in terms of the quantized and cumulative interpretation of the direct object, respectively. We discussed the empirical data on which Krifka bases his proposal concerning Slavic aspect. We argued against the interpretation of the data that Krifka's theory is designed to account for.

However, as we said at the beginning of this chapter, Krifka only presented a sketch of an analysis of Slavic aspect. His ideas were elaborated by Filip. We discuss her work in the following sections.

3.6 The theory of Filip

Filip works out Krifka's ideas for Czech. The central interest of her work lies in the interaction between the verbal and the nominal domain, which she captures in terms of the 'Incremental Theme Hypothesis'. The incremental theme hypothesis states that there is a parallelism in the kind of reference of the verb and its incremental theme argument (we called the idea as applied to Slavic, the parallelism idea). The main goal of Filip's work is to prove the incremental theme hypothesis for Slavic.

In Section 3.6.1 we introduce the incremental theme hypothesis. In Section 3.6.2 we present Filip's argument for the incremental theme hypothesis in Slavic. In Section 3.6.3 we present Filip's argument against the parallelism-based approach to imperfective aspect. In Section 3.6.4 we point out some problems with the data Filip's theory is based on. We conclude our discussion in Section 3.6.5.

3.6.1 General introduction to Filip

In this section we introduce the background and the main goal of Filip's work on Slavic aspect. Filip (1993) aims at formulating language-specific and cross-linguistic hypotheses about the interaction between the verbal and the nominal domain, which she captures in terms of the 'Incremental Theme Hypothesis' (Filip, 1993, page 1-2). Filip assumes that this hypothesis has been proved for Germanic and Ugro-Finnic languages — and she aims at formulating and proving the incremental theme hypothesis for Slavic languages (Filip, 1993, page 4ff.). That is, the main goal of Filip's work is to show that in Slavic there is an interaction between the verbal and the nominal domain that semantically corresponds to the one that has been observed in Germanic and Ugro-Finnic languages.

What is the incremental theme hypothesis? Let us briefly go through some of the examples that Filip lists as supporting the hypothesis.

First, Filip presents 'familiar examples from English' of the kind of oppositions between atelic *he drank wine* and telic *he drank a glass of wine*. She interprets the opposition between such sentences as showing that 'the boundedness property of the

Incremental Theme argument determines the boundedness (telicity) of a complex verbal predicate', and she claims that 'this holds across languages' (Filip, 1993, page 4).

Second, she claims that 'the partitive and holistic meaning of the Incremental Theme argument determines the imperfective and perfective aspect in German and Finnish' (Filip, 1993, page 5). An example from which she draws her conclusion is the German opposition between a sentence with an accusative direct object *Alex baute ein Haus* 'Alex built a house'/'Alex was building a house' and a sentence with the 'partitive *an*-phrase' *Alex baute an einem Haus* 'Alex was building a house'. Another example is the Finnish opposition between a sentence involving an object in the partitive case *Join kahvia* 'I was drinking coffee', and a corresponding sentence with an accusative object *Join kahvin* 'I drank up (all) the coffee'.

Third, she claims that 'the aspectual meaning, partitive and holistic, marked on the verb determines the partitive and holistic (universal) interpretation of the Incremental Theme argument. This holds for Slavic languages like Czech, but also for English' (Filip, 1993, page 5-6). This third claim expresses the central idea of Filip's work on Slavic aspect, and in the next section we shall investigate it in detail — in the remainder of the present section, we only draw a preparatory outline of it.

Filip supports the incremental theme hypothesis for Slavic with the opposition between the imperfective sentence *pit víno* '(he) drank-impf wine' and the perfective *vypit víno* '(he) drank-perf wine', which she translates as 'he was drinking (the/some) wine' and 'he drank up (all) the wine', respectively. (As the reader may recall from Section 3.5.2, the same pair of sentences was used by Krifka.) Like Krifka, Filip claims that the sentences reveal a contrast in the interpretation of the direct object, which stems from the verbal aspectual morphology. According to Filip, it is the marker of perfective aspect that imposes the 'bounded, universally quantified and often referentially specific' interpretation on 'the undetermined mass noun phrase' (Filip, 1993, page 6).

[The perfective sentence *vypit víno* 'drank-perf wine'] contains the prefixed perfective verb *vypitP* and entails that the event ended when the Agent finished drinking all the wine. Moreover, the speaker presupposes that the hearer can identify the relevant portion of wine in the discourse. In this most natural, single event, interpretation, *víno* 'wine' is *bounded, referentially specific (or) definite* and *universally quantified*. This interpretation is often associated with the referential use of definite descriptions in languages like English. (Filip, 1993, page 337)

By contrast, [sentence *pit víno* 'drank-impf wine'] with the imperfective verb *pitI* suggests that there was an *unbounded* amount of wine (existential quantification). ... In this use of the mass direct object noun phrase *víno* 'wine' closely corresponds to English undetermined noun phrases. (Filip, 1993, page 337)

On the basis of her interpretation of the Slavic data, Filip formulates the following

Incremental Theme Hypothesis for Slavic:

In Slavic languages verbal morphology constrains the interpretation of the Incremental Theme argument. Perfective and imperfective operators as well as specific verbal affixes stand in a similar relation to the Incremental Theme argument as determiner quantifiers do to the nouns with which they are combined. (Filip, 1993, page 4)

Filip explores the data supporting the Incremental Theme Hypothesis for Slavic with a method that ‘combines empirical cross-linguistic study and theoretical work done within the framework of event semantics. It is directly related to the research on the syntax-semantics interface in the domain of argument structure and in the domain of quantification.’ (Filip, 1993, page 3). As to the first theoretical tradition, she says that ‘the partitive-holistic distinction that constitutes the semantic core of aspect lends itself naturally to a description within the theories of *mereology*, or the logic of part/whole relations’ (Filip, 1993, page 17), and she relates her work to Bach (1981). She mentions two advantages of working in the framework of mereology. According to her, ‘it allows us to describe in a straightforward way the integration of aspect and telicity in the sentence’s semantics (Filip, 1993, page 17), and ‘it has the advantage that it permits us to motivate the transposition from space to time’, and vice versa.

3.6.2 Proving the Incremental Theme Hypothesis for Slavic

In this section we present the empirical data which Filip interprets as proving the incremental theme hypothesis for Slavic.

According to Filip, ‘the best examples for the influence of aspect on the semantic properties of nominal arguments can be found in sentences that contain undetermined mass and plural noun phrases that function as direct objects’ (Filip, 1993, page 337). Examples of such sentences are given in (10) and (11), which are Filip’s examples (1) and (2) from Filip (1994); (the glosses, the translations, as well as the explanation of the translation of (11-b) are hers).

- (10) a. Pil(I) kávu.
drank-SG-MASC coffee-ACC
‘He was drinking (some) coffee.’
b. Vypil(P) kávu.
PREF-drank-SG-MASC coffee-ACC
‘He drank up (all) the coffee.’
- (11) a. Pletla(I) svetry.
knitted-SING-FEM sweaters-PL-ACC
‘She was knitting sweaters.’
b. Upletla(P) svetry.
PREF-knitted-SING-FEM sweaters-PL-ACC
‘She knitted (all) the sweaters.’ [i.e. she finished knitting all the sweaters.]

(10-a) and (10-b) on the one hand, and (11-a) and (11-b) on the other, differ only as to the presence or absence of the perfective prefix (in (10-b) it is the prefix *vy-*, and in (11-b) it is the prefix *u-*). Filip claims that this formal difference between the sentences in (10) and those in (11) is reflected by the difference in the semantics of the direct object. In particular, Filip claims that in contrast to the objects in the imperfective sentences, the formally identical objects in the perfective sentences are interpreted as referentially and quantificationally specific. As she puts it:

Though the mass and plural noun phrases do not have referents with inherent boundaries, in (1b) and (2b) [that is, our (10-b) and (11-b), respectively], the mass noun phrase *coffee* and the plural noun phrase *sweaters* are understood as bounded. In the most natural interpretation of (1b) and (2b) [that is, our (10-b) and (11-b), respectively], the direct object NPs *coffee* and *sweaters* refer to a contextually specific or known portion of coffee and to a specific set of sweaters, respectively. (Filip, 1994, page 230)

Filip explains the formal difference between (10-a) and (10-b) on the one hand, and (11-a) and (11-b) on the other, by linking it to the assumed semantic difference between the objects of these sentences. She concludes that it is the perfective prefix that imposes the quantificationally and referentially specific reading on the object in (10-b) and (11-b). As she puts it:

Such examples clearly show that mass and plural noun phrases derive their bounded and referentially specific interpretation from the perfective verb. . . . the prefix *vy-* in *vypil* (P), as in (1b) [that is, our (10-b)], can be thought of as incorporating the universal quantifier *all* and *whole*. (Filip, 1994, page 230-231)

Filip generalizes that the semantic contribution of the Slavic perfective aspect marker is comparable to the semantic contribution of the Germanic definite article. She writes:

. . . the use of undetermined noun phrases with mass and plural noun heads here corresponds to the referential use of definite descriptions in languages that have a definite article and must be translated with the definite article *the* into English, as shown in (1b) and (2b) [that is, our (10-b) and (11-b), respectively]. (Filip, 1994, page 230)

On the basis of the proposed correspondence between the perfective prefix and the definite article, Filip postulates that the semantics of perfective aspect in Slavic could be explained along similar lines as telicity was explained by Krifka: namely, by conceiving the object as delimiting the event. As she puts it:

(1b) and (2b) [that is, our (10-b) and (11-b), respectively] also entail that the denoted event ended when the Agent finished drinking all the available coffee and knitting all the sweaters. Since both (1b) and (2b) [that is,

our (10-b) and (11-b), respectively] have an "all-inclusive" or "holistic" entailment with respect to their direct object NP *coffee* and *sweaters*, the determiner quantifier *all* may be used in their English translations. (Filip, 1994, page 230)

Let us now turn to Filip's interpretation of the imperfective sentences (10-a) and (11-a). Filip argues that sentences (10-a) and (11-a) express that 'some coffee and some sweaters were subjected to the denoted event'. She writes:

[The direct object in (10-a) and (11-a) not only have an] unbounded, partitive interpretation, but also the referential specificity of their referents may be irrelevant for the purpose of communication. (Filip, 1994, page 230)

On the basis of this interpretation of the objects of imperfective sentences, Filip concludes that the Slavic imperfective aspect corresponds to the absence of definite article in an equivalent Germanic sentence. As she puts it:

... the use of undetermined noun phrases with mass and plural noun heads in such simple imperfective sentences as (1a) and (2a) [that is, our (10-a) and (11-a), respectively] most closely corresponds to English noun phrases with no articles (or perhaps with the unstressed *some*). (Filip, 1994, page 230)

Although Filip relates the Czech marker of perfective aspect to the presence of the definite article in a corresponding Germanic sentence, and the Czech imperfective aspect to the absence of the definite article in a corresponding Germanic sentence, her view on imperfective aspect is actually more nuanced. We present it in the next section.

3.6.3 Filip on a Krifka-style analysis of Slavic

Filip argues that Krifka's theory makes a wrong prediction when applied to imperfective sentences with a count noun incremental theme direct object, such as for instance *psal dopis* 'wrote-impf letter'. On the basis of such sentences, Filip argues that the parallelism idea as it is used to describe the semantics of perfective aspect, cannot be straightforwardly transposed to the domain of imperfectivity.

Filip's argument against Krifka's theory runs as follows. She assumes that the direct object in the imperfective sentence *psal dopis* 'wrote-impf letter' is undoubtedly bounded (that is, quantized). If the object is bounded (that is, quantized), as she thinks it clearly is, by Krifka's homomorphism hypothesis the sentence must be telic. However, on the other hand, Krifka's assumption that the imperfective operator is applicable to atelic predicates only, also predicts that the sentence is atelic. And according to Krifka, for the sentence to be atelic the object should be unbounded (that is, cumulative). But Filip believes that proposing that a singular count noun object is

unbounded (that is, cumulative) is counterintuitive. This leads Filip to conclude that Krifka's claim that the imperfective operator is applicable to atelic verb predicates should be abandoned. Filip writes:

There is a general agreement that perfective aspect forces a bounded (telic) interpretation of the complex verbal predicate. However, it cannot be assumed that imperfective aspect forces an unbounded (atelic) interpretation of the complex verbal predicate. The reason is that it seems to lead to a wrong account of telic imperfective sentences like the following one:

(22) *Psál (I) dopis*
 wrote-SG letter-SG-ACC
 'He was writing a/the letter.'
 'He wrote a/the letter.'

Krifka's (and Dowty's) homomorphism hypothesis (cf. Chapter 3) predicts that the predicate *psál dopis* is telic, because 'write' entails a homomorphism and the noun phrase associated with its Incremental Theme, 'a/the letter', is bounded.

However, contrary to this result, if the imperfective operator were only applicable to atelic (or cumulative) verbal predicates, as Krifka assumes, then *psál dopis* 'write/be writing a/the letter' would have to be atelic. Along the same lines as suggested for perfective sentences, the analysis for the above sentence would come out as follows: Given that imperfective aspect forces an unbounded ("cumulative") interpretation of the complex verbal predicate, the complex verbal predicate will again force an unbounded ("cumulative") interpretation of the object noun phrase. Does it mean that the singular count noun phrase *kniha* 'book' is cumulative in the above example? It would be counterintuitive to assume that singular count noun phrases like *dopis* 'letter' that are linked to the Incremental Theme undergo a 'count-to-mass' shift in the scope of the imperfective operator. This suggests that we need to abandon the claim that the imperfective operator is only applicable to atelic verb predicates. (Filip, 1993, page 348)

Filip argues that Krifka's theory of telicity cannot capture the Slavic distinction between imperfective and perfective aspect, and she proposes that the notion of (a)telicity is independent of the notion of (im)perfectivity. She defines (a)telicity in terms of (un)boundedness and (im)perfectivity in terms of part/whole relations. The position that she argues for is captured by the following table (the table is identical to Filip's table, up to the letters 'A', 'B', 'C', and 'D', that we insert to ease the presentation) (Filip, 1993, page 265).

	[PART+]	[WHOLE+]
[BOUNDED+]	A a part of a letter I was writing a letter	B a whole letter I wrote a (whole) letter (up)
[BOUNDED-]	C There was sand on the floor I was running on the beach (I ran on the beach)	D (does not occur) (does not occur)

The ‘bounded/unbounded’ and the ‘part/whole’ feature in terms of which Filip defines (a)telicity and (im)perfectivity, respectively, mirror properties of the incremental theme direct object. The two rows are meant to capture the ‘lexico-semantic’ properties of the object, and the two columns are meant to capture the properties of direct object that are imposed on it by the ‘grammatical’ category of aspect. So Cell A stands for a bounded object in an imperfective sentence, and it localizes Filip’s criticism on a Krifka-style analysis of Slavic aspect. Cell D is empty, and this mirrors the claim that unbounded objects cannot occur in perfective sentences, but are re-interpreted as bounded (as the parallelism idea says).

3.6.4 Empirical problems

We’ve seen in Section 3.6.2 that the data that Filip uses to support her analysis of the semantics of aspect in Slavic (and thus to prove the incremental theme hypothesis) is basically the same as that used by Verkuyl, Schoorlemmer and Krifka. In Sections 3.7.1 and 3.7.2 we shall argue against the interpretation that the parallelism-based models propose for this data. In this section we only point out a few unclaritys concerning the reading that in Filip’s opinion the perfective prefix imposes on a mass noun or a bare plural direct object.

At a closer look it becomes less clear how literary one should take Filip’s translation/paraphrase of the Czech perfective sentence *vypil víno* ‘(he) drank-perf wine’ in terms of ‘he drank up (all) the (available) wine’, and therefore, how strict one should understand the paraphrase of the semantics of the direct object as referring to ‘a specific portion of wine uniquely identifiable in the context’. Moreover, it is not completely clear whether the holistic interpretation of the direct object really is an effect of the perfective prefix. Finally, it is not clear how to apply the proposed translation to sentences containing creation verbs.

On the one hand, Filip claims that a mass noun or a bare plural direct object of a perfective sentence has a definite reading, and she defines the semantics of perfective aspect in terms of universal quantification. On the other hand, Filip says that the definite reading of the object cannot always be assumed: “the definiteness in this highest degree is not always required”; “it is sufficient that the referent of the Incremental Theme argument is understood as being individuated, rather than being necessarily uniquely identifiable in the discourse context” (Filip, 1993, page 369-370). Actually,

Filip assumes a concept of ‘definiteness’ as a scalar notion, following (Comrie, 1976, page 128).

But now for the key-matter. Filip explains the understanding of an object as ‘individuated’ out of our knowledge about packaging of beverages, which, she claims, ‘is evoked by the verb *drink*’. That is, in this context Filip does not say that the understanding of the object as ‘individuated’ derives from the marker of perfective aspect. But if the referential reading of the object derives from the lexical meaning of the verb, then the object of the perfective sentence should not differ from the object of an equivalent imperfective sentence with respect to the referential specification — especially, because Filip argues that the Slavic distinction between perfective and imperfective aspect is a grammatical distinction.

The notion of definiteness as used by Filip seems to be connected to the presupposition of existence (recall Filip’s description of (10-b) as entailing that the denoted event ended when the Agent finished drinking all the available coffee). This description of the semantics of perfective aspect in sentence (10-b) is hard to maintain in case of a sentence containing a creation verbs, such as for example (11-b). Filip thus paraphrases the semantics of perfectivity in (11-b) in a slightly different way than she described the semantics of perfectivity in (10-b): namely, as expressing that the event ended when the Agent finished knitting all the sweaters. Still, it is not clear whether in this modified paraphrase the presupposition of existence is really canceled.

3.6.5 Summary

The general goal of Filip’s work is to prove the incremental theme hypothesis for Slavic. In particular, Filip tries to show that the Slavic aspectual morphology plays a role similar to the role played by articles (or more broadly, determiners) in Germanic languages. We focused on the empirical data that Filip uses in order to make her point. We’ve seen that it is exactly the same type of data that is used by Verkuyl, Krifka and Schoorlemmer in order to show that the presence of the perfective prefix in a Slavic sentence corresponds to the presence of the definite article in its Germanic equivalent. In Section 3.7 we criticise the interpretation that Filip, and other parallelism-based approaches, assign to the empirical data in question.

With respect to the approach of Krifka, which Filip took as a starting point for her investigations of the Slavic aspect system, Filip has specified some of its limitations. In particular, Filip argued that Krifka’s approach is unsatisfactory when applied to an imperfective sentence with a count noun direct object.

3.7 The empirical basis of the parallelism-based approaches

In this section we present empirical arguments against the claim that the perfective prefix imposes a [+SQA]/quantized/holistic interpretation of the mass noun or bare plural direct object, and thus (indirectly), against the claim that the perfective prefix

acts as a sort of definite article on the direct object. First, in Section 3.7.1 we reconsider the data that gave rise to the parallelism idea, and then in Section 3.7.2 we provide additional data that according to us cannot be successfully interpreted within a parallelism-based approach. Section 3.7.3 summarizes our discussion.

3.7.1 Reconsidering the data

In this section we reconsider and reinterpret the data a parallelism-based model of Slavic aspect is based on.

Consider sentences in (12):

- (12) a. Jan pił wino
 Jan drank-impf wine
 b. Jan wypił wino
 Jan drank-perf wine

Recall that the parallelism-based approaches view the pair of sentences as crucially differing in the interpretation of the direct object: that is, the object of the perfective sentence is interpreted as quantificationally and referentially specific, and the object of the imperfective sentence is interpreted as quantificationally and referentially non-specific. This interpretational difference is claimed to be mirrored by the English translations of these sentences. That is, the imperfective sentence is claimed to be translated into English without the definite article ('Jan drank/was drinking wine'), and the perfective sentence is claimed to be translated with the definite article ('Jan drank the wine (up)').

To be precise, the imperfective and the perfective sentence can have different readings in different contexts. The imperfective sentence can be interpreted in at least three different ways. First, it can refer to a single event in progress: 'Jan was drinking wine'; this reading is known in the literature under the name 'progressive'. Second, the imperfective sentence can denote a series of events that in some contexts is more accurately described as iterative, and in some other as habitual: 'Jan drank wine'/'Jan used to drink wine'. Finally, the imperfective sentence can refer to a past event whose taking place has a current relevance: 'Jan has drunk wine' (as an answer to a question 'have you ever drunk wine?'); this reading is often called (general-)factive. It corresponds to the semantics of the English perfect tense, as approached by Moens and Steedman (1987, 1988).

The perfective sentence can be assigned three readings, but one of the three readings is clearly the most natural one. In its basic reading, the perfective sentence refers to a completion of a single event of drinking wine: 'Jan finished drinking wine'. Second, as part of certain contexts and rather marginally, the perfective sentence can be used to refer to an iteration of such single drinking-wine events 'Jan would drink wine (...whenever he looked for inspiration)'; understanding such kind of utterances as describing a habit of an individual is not impossible. Finally, the perfective sentence can refer to a past event whose consequences are relevant at the moment of evaluation

of the sentence: ‘Jan has drunk wine’; this reading is often encountered in negated sentences.

In the following discussion, we focus on the progressive reading of the imperfective sentence, and the completion reading of the perfective sentence, since only these readings were analysed within the parallelism-based approaches.

So consider (12-a) in a context that favours the progressive reading: *kiedy przyszli goście, Jan pił wino* ‘when came-perf visitors, Jan drank-impf wine’. On the most natural reading, the progressive sentence (12-a) refers to a single event of wine-drinking and says that at the moment of evaluation this event was going on and was still not completed by Jan. The speaker does not intend to refer to a determinate or specific portion of wine — hence, the object cannot be naturally analysed as [+SQA]/quantized/holistic or definite/specific. The interpretation of the object ‘wine’ can be better captured in predicative terms (that is, as a further specification of the activity of drinking): ‘when the visitors came, I was drinking something, which had the property of being wine’, or in terms of the weak ‘some’: ‘when the visitors came, I was drinking some wine’.

Nonetheless, an interpretation of *wino* ‘wine’ in the progressive reading of (12-a) as quantificationally and referentially specific, is not impossible. For instance, if the denotation of *wino* ‘wine’ would have been previously established, the sentence could be interpreted as referring to that particular (earlier introduced) portion of wine, and this interpretation would be mirrored by the presence of definite article in the English translation. However, this interpretation is rather hard to obtain, since Polish speakers normally use explicit markers of specificity or definiteness if they want to unambiguously refer to a specific or definite object. Examples of explicit markers of definiteness are demonstrative pronouns, and examples of explicit markers of specificity are adjectives *pewien*, *jakiś* ‘a certain’, ‘some’ (the strong ‘some’), etc. So for instance with a sentence *kiedy przyszli goście, Jan pił to wino* ‘when came-perf visitors, Jan drank-impf this wine’, the speaker normally refers to a definite portion of wine; with the sentence *kiedy przyszli goście, Jan pił pewne/jakieś wino* ‘when came-perf visitors, Jan drank-impf (a) certain wine’, he normally refers to a specific portion of wine. Neither *to wino* ‘this wine’ nor *pewne wino* ‘a certain wine’ can be interpreted as a further specification of the activity of drinking.

Let us now turn to the perfective sentence (12-b). In its basic reading, the perfective sentence (12-b) refers to a single drinking-wine event and says that this event was completed, or finished: ‘Jan finished drinking wine’. Exactly as in the case of the progressive sentence, the direct object *wino* ‘wine’ in its perfective equivalent is most naturally interpreted as non-specific: ‘Jan finished drinking some wine’ (‘some’ in the weak interpretation), or as a further specification of the activity of drinking: ‘Jan finished drinking something that had the property of being wine’.

Nonetheless, as was the case in the progressive sentence (12-a), also in its perfective equivalent (12-b), the object *wino* ‘wine’ can in certain contexts be interpreted as specific or definite, and as having a specified quantity. The specific or definite interpretation of the object is possible only if a specific or definite portion of wine has

already been introduced to the discourse. Only under the condition that such a context is established, the object may be translated into English with the definite article. Such a context is for instance created in the following dialogue. *Przed chwilą położyłam na stół wino i orzeszki, a teraz stół jest pusty! — Ja wypilem wino — powiedział Robert.* ‘just now I put on the table wine and peanuts, but now the table is empty! — I drank *wine* — said Robert’. Because the identity of the portion of wine in question is established in the first sentence, *wino* ‘wine’ in the second sentence can refer back to that specific instantiation of wine, which the hearer is supposed to be able to identify. As a result, the event whose completion is asserted in the second sentence, is an event of drinking a specific (contextually established) quantity of wine. By pragmatic reasoning, the hearer of that sentence can infer that most probably the whole portion of wine has been drunk up — and in that way, there can arise the so called ‘holistic’, ‘[+SQA]’, or ‘quantized’ reading of the object. This inference is conditioned by the independently (in particular, contextually) established information identifying the referent of the direct object. It should be emphasized that the holistic reading of the object that arises as an inference in such contexts is not part of the semantics of that object, and it is not imposed on it by the presence of perfective aspect marker — in this case, the perfective prefix. For if it would be, it could not be canceled — but it can. For example, it is canceled in the following dialogue: *Wypileś już swoje wino? — Tak, wypilem, ale nie całe* ‘Have you already finished drinking your wine?’ — ‘Yes, I finished drinking, but not all of it’. By contrast, a similar English dialogue does not make sense if the Polish perfective verb *wypilem* ‘drank-perf’ is translated as a particle verb ‘drank up’: *Did you already drank up your wine? — *Yes, I drank up, but not all of it.* This suggests that the particle verb ‘to drink up’ indeed can be said to require an object which denotes an entity whose quantity is specified, but the perfective verb *wypić* ‘drink-perf’ cannot. The difference suggests that there is a semantic difference between the contribution of the Slavic aspectual morphemes and that of the Germanic particles. The person posing the question in the above Polish dialogue would like to know whether the addressee finished his activity of drinking wine, and he is not interested in the quantity of the wine. In the answer to the question, the speaker simply asserts that he indeed finished his wine-drinking activity — and to spell this out a little, he expresses that he has drunk so much as he wanted and he is not going to drink up the wine that still remains in his glass.

3.7.2 Some more data

In this section we present some additional data that seems to be naturally interpreted in the way proposed in the preceding section, but which does not seem to support an interpretation predicted by a parallelism-based model of Slavic aspect. The data consists of perfective sentences containing incremental theme direct objects that are mass nouns or bare plurals. A parallelism-based theory predicts that the direct objects of such sentences should be [+SQA]/quantized/holistic. We argue that unless a special context is provided, the direct objects of the sentences discussed in this section are assigned a predicative or non-specific interpretation.

Consider (13):

- (13) Jan przeczytał książki, gazety, czasopisma — jednak nie znalazł
 Jan read-perf books, newspapers, journals — yet not found-perf
 informacji na ten temat
 information about this topic
 ‘Jan has read books, newspapers, journals — but he has not found information
 about this topic’

According to parallelism-based approaches, the perfective sentence (13) should be interpreted as expressing that the denoted ‘books, newspapers, journals-reading’ event ended when all the (‘available’, or ‘contextually identifiable’) books, newspapers, journals have been read; the direct object *książki, gazety, czasopisma* ‘books, newspapers, journals’ should be interpreted as denoting a specified quantity ([+SQA], quantized, holistic) or definite/specific. In our opinion, the object *książki, gazety, czasopisma* is most naturally interpreted as ‘some books, newspapers, journals’ (on the weak interpretation of ‘some’), and the sentence should be paraphrased as expressing that Jan finished his activity of reading through some unknown and quantificationally unspecified set of books, newspapers and journals. In our view, the event was completed not due to the fact that the whole set of specific books, newspapers, journals has been read, but due to the fact that at a certain point of time, Jan decided that he has read as much as he intended to, and so he himself considered his activity as completed.

The informal semantic description of perfective aspect in (13) as expressing that the ‘books, newspapers, journals-reading’ event ended when Jan read all the available books, newspapers, journals, is only possible given the interpretation that the parallelism-based theories predict for this and similar sentences. And this interpretation is reflected by the Germanic translations of these sentences. In the spirit of parallelism-based approaches, the sentence (13) would have to be translated into Dutch as ‘Jan las de boeken, kranten, tijdschriften (uit)’, into German as ‘Jan las die Bücher, Zeitungen, Zeitschriften (aus)’, etc.; (we saw in Section 3.5.2 that Krifka translated the Slavic verb containing a perfective prefix by means of a complex German verb containing a particle). It is worth-while to carefully examine these Germanic sentences, since it seems that on the basis of these Germanic sentences, parallelism-based approaches draw conclusions about the Slavic sentences. Regard a Dutch example in (14):

- (14) a. Jan las boeken, kranten, tijdschriften
 Jan read books, newspapers, journals
 ‘Jan read books, newspapers, journals’
 b. *Jan las boeken, kranten, tijdschriften uit
 Jan read books, newspapers, journals out
 ‘*Jan read books, newspapers, journals out’
 c. Jan las de boeken, kranten, tijdschriften uit
 Jan read the books, newspapers, journals out
 ‘Jan read the books, newspapers, journals out’

Since *boeken, kranten, tijdschriften* ‘books, newspapers, journals’ is a direct object that is [-SQA]/cumulative, (14-a) is aterminative (as confirmed by the adverbial test). (14-b) is ungrammatical, since a particle verb *uitlezen* ‘to read out’ requires a [+SQA]/quantized direct object, and the direct object *boeken, kranten, tijdschriften* ‘books, newspapers, journals’ is, as we just said, [-SQA]/cumulative. Since this requirement is met in (14-c), where *de boeken, kranten, tijdschriften* ‘books, newspapers, journals’ is [+SQA]/quantized, (14-c) is a grammatical terminative sentence (as confirmed by the adverbial test).

The comparison between the Polish sentence in (13) and the Dutch sentences in (14) should make clear the difference between Polish perfective prefixised verbs, and Germanic particle verbs: while the Polish empty prefixised verb *przeczytać* ‘to read-perf’ can combine with a [-SQA]/cumulative direct object, the Dutch particle verb *uitlezen* ‘to read out’ cannot. If *przeczytać* ‘to read-perf’ would be equivalent to *uitlezen* ‘to read out’, then the sentence (14-b) should be grammatical (given that the direct object *książki, gazety, czasopisma* ‘books, newspapers, journals’ in (13) is interpreted as quantificationally unspecified, as we argued). That is, in contrast to the Germanic particle verbs, the semantics of the Polish perfective verb does not require that the whole entity referred to by the direct object should be affected by the event in order for it to be regarded as completed. The Polish perfective aspect simply expresses that the agent completed his activity of reading, which means that the point of time at which the action is called completed, is determined by the intention of the agent, and not by the quantity of the entity denoted by the direct object. Nonetheless, in certain contexts, the moment of time at which the agent completes an event can fall together with the moment of time at which the whole entity denoted by the object has undergone the action; this is typically the case when the quantity of the object is clearly specified (for instance, by context, or in case of count nouns, nouns accompanied by a numeral, etc.). But as we said in the previous section, the holistic reading of the object can be derived by pragmatic reasoning and is not part of the semantics of perfectivity (we will make this point explicit in examples (18-a) and (18-b) below).

Consider the perfective sentence (15), in which the direct object does not seem to be naturally interpreted as [+SQA]/quantized/holistic.

- (15) Dopiero co zjadłem czekoladę i nie chcę jeść obiadu
 just now ate-perf chocolate and neg want eat dinner
 ‘I just now have eaten chocolate and do not want to eat dinner’

The direct object *czekoladę* ‘chocolate’ in (15) seems to be most naturally interpreted as specifying in more detail the event of eating: ‘I just now have eaten something that had the property of being chocolate’, or as non-specific: ‘I just now have eaten some chocolate’ (on the weak interpretation of ‘some’). Hence the completion of the chocolate-eating event cannot be successfully analysed as having ended at the moment that the whole contextually identifiable portion of chocolate has been eaten up. This suggests that the contribution of the perfective prefix cannot be successfully described in terms of imposing a [+SQA]/quantized/holistic interpretation on the mass noun or a bare plural direct object.

Consider the perfective sentence (16) in which there is no direct object.

- (16) Npisałam do niej po dwóch latach
 wrote-perf to her after two years
 'I wrote to her after two years'

The example in (16) (and (17)) shows that the presence of the perfective prefix does not require the presence of a direct object, and so cannot be successfully analysed by comparing it to the definite article in Germanic.

Consider another example showing that the semantics of perfective aspect does not lend itself to an analysis in terms of the [+SQA]/quantized/holistic reading of the direct object. In a restaurant, the waitress who has noticed that the guest has stopped eating her dinner some time ago, and would like to clean the table, can ask the question in (17)—despite the fact that she can clearly perceive half of the guest's dinner still on her plate.

- (17) Czy pani już zjadła?
 whether lady already eat-perf
 'Have you finished eating?'

Clearly, (17) is a question whether the guest has finished her activity of eating her dinner, and not a question whether she has eaten up everything — this, the waitress can see herself. That is, perfective aspect concerns information about temporal properties of an event, and not quantificational properties of the object that undergoes it. And as (17) suggests, finishing one's dinner-eating activity does not always mean eating up everything — though sometimes it does. And if it does, the moment at which the whole dinner has been eaten up overlaps with the moment at which the agent considered his or her activity as finished. Nonetheless, asking whether somebody has finished eating is not the same as asking whether somebody ate up whatever he was eating. This contrast is discussed on the basis of the following example.

It seems questionable whether the semantics of perfective sentences can be correctly described as expressing that a given event ended when the whole entity denoted by the direct object has undergone it, and to view the entity denoted by the object as determining the point of time at which the event ended. The reason is that very often it is not possible to determine on the basis of linguistic information what exactly it means for the object to have undergone the action completely; in other words, the holistic interpretation of the object can mean different things in different situations. Consider the contrast between the sentences in (18):

- (18) a. Maria zjadła banana
 Maria eat-perf banana
 'Marie ate a banana'
 b. Osioł zjadł banana
 donkey eat-perf banana
 'The/a donkey ate a banana'

According to the parallelism based approaches, the sentence should be interpreted as expressing that the eating-(a)-banana event ended when the whole banana was eaten up. This is problematic, since an eating-(a)-banana event can be finished/completed before the whole banana has been eaten up. For instance, we don't know for sure what it means for Maria in the particular event referred to in (18-a) to have eaten up the whole banana; she most probably did not eat the peel, but she also might have cut off one or even both ends of the fruit itself, as some people do. However, when a donkey eats a banana, it most probably eats the peel as well, and it rather does not leave behind the ends of the fruit. So probably, Maria did not eat up the whole banana when she finished the activity of eating a banana. However, a donkey most probably indeed ate up the whole banana and only then stopped eating. This shows clearly that it is not possible to determine on the basis of linguistic material what exactly it means for a certain object to have undergone the action completely; but then it is also not a linguistic problem. In the light of this observation, the analysis of the perfective sentence as expressing that the event ended when the whole entity denoted by the direct object has undergone the action, is wanting.

3.7.3 Summary

In Sections 3.7.1 and 3.7.2 we presented empirical data showing that perfective aspect is compatible with objects the quantity of which is not specified. This suggests that perfective aspect cannot be successfully explained in terms of a [+SQA]/quantized interpretation of the direct object (or, for that matter, in terms of the definite article).

The empirical data suggests that it is not the quantity of the object that determines that at some point the event was finished, as the parallelism-based approaches claim. Rather, in the case of the type of sentences discussed by parallelism-based approaches, it is the agent who determines at which point he considers his activity as finished. Nonetheless, in certain contexts it may be possible to *infer* certain information about the extent to which the object was affected in the course of the event. For instance, if the speaker asserts completion of an event which was initiated in order to affect a specific or definite object, the hearer can infer that most probably the whole quantity of the object has been affected by the event. However, if the description of the event involves a non-specific direct object, or an object that is predicatively used, the assertion about the completion of that event does not allow us to infer the holistic reading of the object. Since the holistic reading of the direct object arises as a pragmatic inference, and is not part of the semantics of the direct object, it can be canceled.

In our opinion, the semantic information contributed by perfective aspect concerns information about a temporal property of the event, and not about an quantificational property of the object that undergoes that event — though the information about the extent to which the object has been affected by the action can in certain contexts be inferred.

Chapter 4

An Aspectual Classification of Polish Verbs

4.1 Introduction

Until now, this thesis has been historical and critical. In Chapter 1 we outlined some basic facts about Polish aspect and its evolution. In Chapter 2 we discussed the historical development of the concept of aspect (and *Aktionsart*) in the Germanic and Slavic linguistic traditions. In Chapter 3 we presented and critically discussed the work of Verkuyl, Krifka, Schoorlemmer and Filip, four representatives of recent Western work on aspect. So we have reached a critical point in the thesis: to make further progress we have to show that a verb-centered view on Polish aspect is both possible and natural.

As should be clear from the complex history recounted in Chapter 2, few writers on aspect believe that this can be done. The over-riding impression the reader is likely to have formed is that the Polish aspectual system is intrinsically complex, and that there is little hope of discerning any substantial regularity.

We will show that this impression (which is widely held in the aspectual literature) is mistaken. We shall do so by introducing a classification of Polish verbs. Our classification is formationally driven: we shall divide Polish verbs into five classes on the basis of the patterns of aspectual affixation they enter into.

But in spite of its essentially formal nature, our aspectual classification reveals considerable semantic regularity in the Polish verb system. Indeed, as we shall see, the classification induces temporal distinctions on Polish verbs, distinctions that look rather like Vendler (1957)-style distinctions. Actually, a better comparison is perhaps with the work of Moens and Steedman (1987, 1988), rather than Vendler, but for now this choice is relatively unimportant. What *is* important is the word 'induced'. Vendler-style verb classifications are usually imposed from above: the linguist (or philosopher) draws distinctions on the class of verbs based on semantic intuitions. To be sure, appeal is often made to more formal criteria (notably restrictions on adverbial

modification) when distinguishing the classes, nonetheless the approach is essentially semantically driven. Our approach, on the other hand, is formationally driven. The formational regularities of Polish lead us to the temporal semantic distinctions — we do not impose them. We view this as strong evidence that the Polish aspectual system is highly systematic (a relatively simple formational basis, namely the patterns revealed in our classification, supports substantial semantic information) and that its function is to encode temporal distinctions.

We proceed as follows. In Section 4.2 we present our classification. In Section 4.3 we make our methodological assumptions (and in particular, our systematic use of the *secondary imperfectivisation test*, together with its mirror-image, a test that we call the *secondary perfectivisation test*) explicit. In Section 4.4 we show that the classification induces temporal distinctions: in particular, our formationally defined classes automatically induce the distinctions between culmination verbs, unitisable process verbs, culminating process verbs, process verbs, and state/gradual transition verbs. In Section 4.5 we consider ways of making the classification more fine-grained; in particular we investigate whether it is possible to induce a formationally driven distinction between state and gradual transition verbs, and examine the Polish ‘suffixation system’ in detail. At the end of this chapter the reader should have a firm grasp of how our classification works, and of the semantic distinctions it induces (and does not induce). This paves the way for the following chapter, where we shall subject the classification to a deeper scrutiny.

4.2 A Verb Classification

Let us begin with a simple question. Suppose you are a Polish native speaker. Now, you will be well aware that Polish verbs make aspectual distinctions. But what exactly are the formational resources at your disposal that enable you to alter the aspectual meaning of Polish verbs while leaving their lexical meaning unaltered? Or to use the traditional terminology: how exactly do you go about forming aspectual pairs?

First, let us narrow the question a bit. In our classification we only consider what we call the ‘single episode’ reading of a verb, and we rule out its non-single episode readings. A verb has a single episode reading if it refers to a single actual event (taking place at a particular moment of time). A non-single episode reading is a catchall term for iterative/habitual, or generic readings.

We claim that there are four possibilities of forming aspectual pairs: we can form them by adding an empty prefix, by adding the delimitative prefix *po-*, by inserting the semelfactive suffix *-ną-*, or by making use of suffixation possibly combined with vowel change. As it would be tedious always to have to talk of “suffixation possibly combined with vowel change”, from now on we shall call the fourth option *morphological change*. (We take our terminology from Czochralski (Czochralski, 1975, page 15); this is our translation of his *morphologischer Wechsel*.) In Section 4.5.2 we examine in detail the kinds of morphological changes that are possible in Polish.

In what follows we shall call these four possibilities (that is, empty prefixation, delimitative *po-* prefixation, semelfactive suffix *-ną-* insertion, and morphological

change) *formants*, *formations*, or *formational possibilities*. Actually, we are strongly tempted to call these operations *aspectual formations*, or *aspectual formational possibilities*, for (as we shall argue in the following section) we regard all four operations as aspectual in a precise sense. But at this stage such a choice of terminology would be controversial. For a start, the use of the *po-* prefix or *-nq-* suffix are not usually thought of as aspectual operations (they are usually considered to be examples of Aktionsart) and some readers may doubt whether their use really does alter the temporal meaning of a Polish verb while leaving its lexical meaning unaltered. Moreover, as we mentioned in Chapter 2, many writers on aspect deny the existence of empty prefixes altogether. In short, of the four formants used in the classification, only one (namely morphological change) is uncontroversially regarded as truly aspectual. So — for the time being — we shall stick to the more neutral terminology of ‘formants’ and ‘formational possibilities’. Nonetheless, by the end of the chapter we will have given strong evidence that these four formational possibilities are the operations that lie at the heart of the Polish aspectual system.

Having isolated these four classes of formational operation, we now make a simple observation: different verbs select different formational possibilities. This leads to the question which gives us the classification: *how much system is there to this?* That is, what exactly are the possible verb/formant combinations? An examination of the data shows that if we classify Polish verbs on the basis of the formational possibilities they can enter into, we obtain five classes. Here is the resulting Polish verb classification in the form of a table:

	ep	<i>po-</i>	<i>-nq-</i>	mpc
class ₁	yes			
class ₂		yes		
class ₃	yes	yes		
class ₄	yes	yes	yes	
class ₅				yes

The top line of the table reads as follows: ep stands for empty prefix, *po-* is the delimitative prefix *po-*, *-nq-* is the semelfactive suffix *-nq-*, and mpc stands for morphological change (vowel change and/or suffixisation of a perfective verb; a particularly simple example of morphological change is insertion of the *-yw-* suffix).

The table should be read as follows. Each row records the formational possibilities open to a member of the relevant verb class. For example the first row tells us that a verb is a class₁ verb if its sole formational possibility is to take an empty prefix. The second row tells us that a verb is a class₂ verb if its sole formational possibility is to take the delimitative prefix *po-*. And to give a more complicated example, the fourth row tells us that a verb is classified as class₄ if it has precisely three formational possibilities: it takes an empty prefix, the *po-* prefix, and can be suffixised by *-nq-*. As this last example shows, our use of ‘yes’ in the above table is conjunctive. Thus the two yeses in row three mean that class₃ verbs have both the formational possibilities (ep and delimitative *po-*) indicated.

A general remark. Sometimes a single morphological operation can be used in several ways semantically. For example, the class₅ verbs are imperfectivized by morphological changes, and in many cases this amounts to using *-yw-* as a suffix. But this same suffix may be applied to some other verbs to produce a different semantic effect: we can also suffixise imperfective *pisać* ‘to (be) writ(ing)’ (a class₃ verb) by *-yw-*, an operation which results in *pisywać* ‘to write from time to time/have a habit of writing’ (that is, with some verbs *-yw-* suffixisation can be used to form a verb with an iterative/habitual reading). But such combinations are not relevant to our classification and are not included in the table. For a start, in such combinations, the suffix is not used as a formant deriving an aspectual twin of the basic imperfective verb (iterative verbs are imperfective). Moreover, as we said above, our classification rules out non-single episode readings such as for instance iterative/habitual reading. In addition, applying the suffix *-yw-* to derive iterative/habitual verbs is not a productive process in contemporary Polish, and the few still existing iterative/habitual verbs involving the suffix *-yw-* should rather be treated as fossilized (that is, lexicalized) combinations of a basic verb and a formant. Polish native speakers would view *pisywać*, the iterative/habitual form, as a semantically distinct verb from *pisać*; that is, in this case the *-yw-* suffixisation has induced a shift in lexical meaning, and indeed *pisywać* has a different dictionary entry.¹ Our table covers only those verb/formant combinations which we regard as genuinely aspectual. Roughly speaking, this means that they “change temporal meaning while leaving lexical meaning unaltered”. We shall give a precise definition in the following section.

But why do we use the words ‘formants’, ‘formations’, and ‘formational possibilities’ to refer to suffixes or prefixes? Essentially, because we wish to abstract away from whether prefixation or suffixation is used. Indeed, we wish to abstract away from whether the underlying mechanism was word-formational (derivational) or inflectional (grammatical). As we said in Chapter 1, the word ‘formant’ is a crucial analytical term used in word-formational analysis, as opposed to morphematic analysis, in which one speaks of morphemes (prefixes, suffixes, and so on). The word-formational analysis does not decompose a word into minimal units (that is morphemes), as morphematic analysis does. Rather, its goal is to capture the *mechanism* deriving that word. Hence, it always decomposes the word into two elements: the ‘basic’ word (that is, the word from which the analysed word was derived) and the ‘formant’ (that is, the morpheme used to derive the analysed word from the basic word); extracting the ‘formant’ is crucial.

We use the terminology of word-formational analysis to describe the mechanism of deriving aspectual twins; and so we view an aspectual pair as crucially consisting of a (aspectually) basic verb and a complex verb, which is derived from the basic verb by means of an aspectual formant. Let us spell this out. We refer to the empty prefix, the delimitative prefix *po-*, the semelfactive suffix *-ną-*, and *mpc* as ‘formants’ that are used to derive an aspectual twin for a certain ‘basic’ verb. We are *not* interested in

¹The view that iterative verbs and the corresponding single-time imperfective verbs function in contemporary Polish as different lexical items, is defended by Czochralski (Czochralski, 1975, page 23); a similar view on Russian iterative verbs was defended by Isačenko (Isačenko, 1962, page 405).

these morphemes as such — that is, in all the functions that they can fulfill in the Polish language. In fact, it is precisely what we wish to abstract away from. Working at the higher level of formants enables us to see regularities obscured by the morphemic analysis: the regularities revealed by the classification.

As this classification underlies our work in the remainder of the thesis, it is important to understand it fully. In particular, it is important to realize that it is intended to be a classification in the strong sense of the word: *it provides necessary and sufficient conditions strong enough to assign every Polish verb (to which it applies) to a unique class.*² The simplest way of making this point is to present the classification once again, this time in the form of a Prolog program:³

```
class_1(X) :- formant(X,ep(_),-po,-na,-mpc).
class_2(X) :- formant(X,-ep,po,-na,-mpc).
class_3(X) :- formant(X,ep(_),po,-na,-mpc).
class_4(X) :- formant(X,ep(_),po,na,-mpc).
class_5(X) :- formant(X,-ep,-po,-na,mpc).
```

This is a very simple program, and its sense should be clear. For example, the first line says that `X` belongs to `class_1` if `X` is a verb that takes an empty prefix (note the `ep(_)`), but does not take `po-` (note the `-po`), does not take `-na-` (note the `-na`), and does not undergo morphonological change (note the `-mpc`). Observe that we use Prolog’s anonymous variable (the `_` in `ep(_)`) to record the fact that while there must be some value for the empty prefix, it is irrelevant which prefix it actually is. Now consider the fourth line. This says that `X` belongs to `class_4` if `X` is a verb that takes an empty prefix (note the `ep(_)`), and `X` also takes `po-` (note the `po`), and `X` also takes `-na-` (note `na`), but `X` does not undergo morphonological change (note the `-mpc`).

In short, this program is a full declarative specification of the classification, and (given the required lexical information) it assigns each Polish verb a unique class. Moreover, since Prolog has a procedural interpretation, we can use it to compute these class assignments. For example, suppose we are working with the following (toy) Polish lexicon:

```
formant(blednac,ep(z(a)),-po,-na,-mpc).      % to be growing pale
formant(ciemniec,ep(z(a)),-po,-na,-mpc).     % to be becoming dark
formant(czytac,ep(prze),po,-na,-mpc).        % to be reading
formant(dac,-ep,-po,-na,mpc).                % to have given
formant(gotowac,ep(u),po,-na,-mpc).          % to be cooking
formant(grubnac,ep(z(a)),-po,-na,-mpc).      % to be growing fat
formant(gwizdac,ep(z(a)),po,na,-mpc).        % to be whistling
formant(jesc,ep(z(a)),po,-na,-mpc).          % to be eating
formant(kochac,ep(po),-po,-na,-mpc).         % to be loving
formant(krzyczec,ep(z(a)),po,na,-mpc).       % to be shouting
```

²Why the caveat “to which it applies”? Because there are a small number of Polish verbs to which this classification is not intended to apply. For example, a handful of Polish verbs come in suppletive pairs (that is, there is no morphological link between the two verbs in the pair; the perfective and imperfective forms are two completely distinct words). In addition, the classification is not intended to apply modal verbs or habitual/iterative verbs. We discuss these restrictions in Chapter 5.

³For an easy introduction to Prolog see the online introduction ‘Learn Prolog Now!’ by Patrick Blackburn, Johan Bos and Kristina Striegnitz: <http://www.coli.uni-sb.de/kris/learn-prolog-now/>

formant(kupic,-ep,-po,-na,mpc).	% to have bought
formant(madrzec,ep(z(a)),-po,-na,-mpc).	% to be becoming wise
formant(migac,ep(z(a)),po,na,-mpc).	% to be twinkling
formant(mrugac,ep(z(a)),po,na,-mpc).	% to be winking
formant(pic,ep(wy),po,-na,-mpc).	% to be drinking
formant(pisac,ep(na),po,-na,-mpc).	% to be writing
formant(pracowac,-ep,po,-na,-mpc).	% to be working
formant(pukac,ep(z(a)),po,na,-mpc).	% to be knocking
formant(rozumiec,ep(z(a)),-po,-na,-mpc).	% to be understanding
formant(rysowac,ep(na),po,-na,-mpc).	% to be drawing (a picture)
formant(siedzic,-ep,po,-na,-mpc).	% to be sitting
formant(spacerowac,-ep,po,-na,-mpc).	% to be walking
formant(tupac,ep(z(a)),po,na,-mpc).	% to be stamping (one's feet)
formant(ufac,ep(z(a)),-po,-na,-mpc).	% to be trusting
formant(wierzyc,ep(u),-po,-na,-mpc).	% to be believing
formant(wrocic,-ep,-po,-na,mpc).	% to have come back

(The meaning of these entries should be clear. For example the entry for *czytac* tells us that it is a verb that takes an empty prefix (namely *prze-*) and the delimitative prefix *po-*, but that does not take the *-nq-* suffix nor undergo morphonological change. The entry for *wrocic* tells us that this is a verb which does not take an empty prefix, does not take *po-*, does not take *-nq-*, but which does undergo morphonological change.)

Computing the class assignments (that is, classifying the lexicon) is merely a matter of posing Prolog queries. For example the query

```
?- class_1(V).
```

extracts all the *class₁* verbs (namely *blednac*, *ciemniec*, *grubnac*, *kochac*, *madrzec*, *rozumiec*, *ufac*, and *wierzyc*), and the query

```
?- class_4(V).
```

extracts all the *class₄* verbs (namely *gwizdac*, *krzyczec*, *migac*, *mrugac*, *pukac*, and *tupac*).

4.3 Methodological remarks

We must now take a closer look at the ideas underlying this classification. First, we have said that the classification is ‘essentially formal’, but what exactly do we mean by this? Second, the only reason we have given for our choice of formational possibilities is that they are the ones which “change temporal meaning without changing underlying lexical meaning”. This seems a somewhat flimsy basis on which to build; is it not possible to give the classification a more solid grounding? It is crucial to address this issue. The key claim of this chapter is that our aspectual classification automatically induces aspectual distinctions — but this claim will only be interesting if the classification has a firm foundation.

Let’s begin with the first question. In what sense is this classification formal? The most obvious answer is this. Given a Polish verb, once we know which of the four formants (empty prefix, delimitative *po-*, semelfactive *-nq-*, and morphonological

change) can be legitimately applied, there is no further question as to which class the verb belongs to: the definitions embodied in the table fix the matter once and for all. Or to put it in terms of Prolog, once we have fixed our lexicon, there is no room for debate as to how to classify a particular verb: the answer can be straightforwardly computed using the five Prolog rules.

But there is a second (and deeper) sense, in which our classification is formal, and this sense leads to an answer to the second question. When we are given a verb to classify, the crucial decision to make is which of the four formants (empty prefix, delimitative *po-*, semelfactive *-nq-*, and morphological change) change the temporal meaning without changing the lexical meaning. Or to rephrase this in traditional terminology, the key point is to decide which kinds of formational operation give rise to aspectual pairs. But how exactly should we go about making this decision?

Now, in some cases this is uncontroversial. In particular, there is no dispute about how to do this for class₅ verbs. This class contains only perfective verbs (this is clear from the table: recall that morphological change is simply our Czochralski-style terminology for “suffixation possibly combined with vowel change”, and this is the operation which converts perfective verbs into imperfective verbs). Given any such verb, any Polish native speaker (and indeed, any Polish linguist) would agree that morphological change is a process that gives rise to genuine aspectual pairs.

But what about the first four classes? The verbs in these classes are all imperfective (this is clear from the table: prefixation, whether by empty prefixes or delimitative *po-*, and suffixation by *-nq-* convert imperfective verbs to perfective verbs) and here matters are more controversial. For a start, as we mentioned in Chapter 1, some authors question the very existence of empty prefixes. Moreover, our classification adds fuel to the fire: not only does it treat empty prefixes as a legitimate aspectual forming operation, it also treats the delimitative *po-* prefix and the semelfactive *-nq-* suffix (both of which are standardly thought to lead to a change in Aktionsart) as aspectual devices. Furthermore, our classification leads to consequences that may seem strange on first acquaintance: in our approach (as the table makes clear) while some verbs have only one aspectual twin (namely verbs belonging to class₁, class₂, and class₄), verbs belonging to class₃ have two aspectual siblings, and verbs belonging to class₄ have three. This isn't a traditional way of thinking about Polish aspect.

Given all this, it would be highly unsatisfactory if we simply rested our classification on the (suspiciously hard to verify) claim that empty prefixation, delimitative *po-* prefixation, and semelfactive *-nq-* suffixation are all operations that “change temporal meaning without changing lexical meaning”. Semantic intuitions tend to be fuzzy and the best of times — and the judgment involved here is particularly subtle. We need a more solid foundation.

And a suitable foundation is available: the secondary imperfectivisation test. We introduced this test in Chapter 2. In essence, the test replaces the (difficult) question of deciding whether a perfectivisation operation “changes temporal meaning without changing lexical meaning” with a simpler question: *how can we imperfectivise a verb that we have just built by a perfectivising operation?* If the only way of doing this is to ‘undo’ the perfectivising operation and return to the original imperfective verb,

then the test tells us that we have found a genuine aspectual pair. On the other hand, if we can apply morphological change to the perfectivised form (that is, if we can re-imperfectivise without returning to the original verb) then we are not dealing with an aspectual pair. As we are going to use this test heavily in what follows, let us formulate it more precisely:

The Secondary Imperfectivisation Test

Let *impf-verb* be an imperfective verb, and let *Perf(impf-verb)* be a perfective verb formed from it by applying either a prefix or the *-ną-* suffix. Then:

1. If the only way of imperfectivising *Perf(impf-verb)* to obtain a verb with a single episode meaning is to return to the original verb (that is, *impf-verb*) then we say that *impf-verb* passes the secondary imperfectivisation test, and that *Perf(impf-verb)* and *impf-verb* are aspectual pairs.
2. On the other hand, if *Perf(impf-verb)* can be imperfectivised to a verb with a single episode meaning by some other means, then we say that *impf-verb* fails the secondary imperfectivisation test, and that *Perf(impf-verb)* and *impf-verb* are not aspectual pairs.

One way of thinking about the test is this. (Actually, we don't fully agree with the following way of thinking about the test, but more on that later; meanwhile it is a useful starting point.) If perfectivisation followed by imperfectivisation does not take us back to the original (imperfective) verb, then this suggests that some non-temporal component of meaning has crept in along the way. On the other hand, if perfectivisation followed by imperfectivisation is only possible by moving back to the original verb, then this suggests that the operations involved only temporal changes of meaning, and hence that we are dealing with genuine aspectual pairs. The joy of this test is that it enables us to replace subtle semantic judgments ("Is this *really* a purely temporal change, or has some change of lexical meaning sneaked in?") by a formal criterion: what are the secondary imperfectivisation possibilities? Moreover, it gives precise (indeed, elegant) content to the pre-theoretical intuition that Polish verbs come in aspectual pairs.

The test has a long history. It was used for Russian by Stender-Petersen (Stender-Petersen, 1933/34, page 331f.), Lomtev (Lomtev, 1958, page 245f.), Forsyth (1970), among others; for Polish by Klemensiewicz (Klemensiewicz, 1951, page 653), among others. Some scholars do not refer to this test explicitly, but they base their investigations on the logic that underlies it — for instance, Czochralski (1975). He assumes that one of the distinctive features of the category of aspect is that it is a *binary* category, which means that it does not form 'aspectual *triples*' (Czochralski, 1975, page 18). Some authors (notably, Bogusławski (Bogusławski, 1963, page 107)) have questioned the reliability of the secondary imperfectivisation test, pointing to verbs such *balsamować* 'to embalm (a corpse)' (which can be perfectivised to *zabalsamować*

and then re-imperfectivised to *zabalsamowywac*, and *planowac* ‘to plan’ (which can be perfectivised to *zaplanowac* and then re-imperfectivised to *zaplanowywac*.⁴ But it is debatable whether these are genuine counterexamples. The primary reading of both the secondary imperfectivised forms is iterative, not single episode, and in any case such examples are rare and do not seem to be widely used (an examination of the 60 million word Corpus of the Polish Dictionaries Department of PWN Scientific Publishers reveals no instances of the re-imperfectivised forms).

We have defined the test in a slightly more general way than these authors do. The test is usually used on verbs perfectivised by prefixation (indeed, the test is normally used to support the concept of empty prefixes). However the test also makes perfectly good sense when used with verbs perfectivised by the *-ną-* suffix. Let’s systematically apply the test to representative verbs from the classes 1 through 4 to check that it works as claimed.

To form an aspectual twin of a class₁ verb we add its empty prefix. For example, *wierzyć* ‘to be believing’ becomes *uwierzyć* ‘to start to believe’; *rozumieć* ‘to be understanding’ becomes *zrozumieć* ‘to start to understand’; *mądrzeć* ‘to be becoming wise’ becomes *zmądrzeć* ‘to have become wise’; and *grubnąć* ‘to be becoming fat’ becomes *zgrubnąć* ‘to have become fat’. Why do we regard these verbs as aspectual pairs? Because we cannot undo the perfectivising effect of the empty prefixes in any other way than by going back to the original verb. That is, as our classification claims, we can view these verbs as aspectual pairs because they pass the secondary imperfectivisation test.

To form the aspectual twin of a class₂ verb we apply the delimitative prefix *po-*. For example, from *siedzieć* ‘to be sitting’ one can derive *posiedzieć* ‘to have sat for a while’, from *spacerować* ‘to be walking’ one can form *pospacerować* ‘to have walked for a while’. But is the complex delimitative verb really a true aspectual twin of the original verb? According to the secondary imperfectivisation test, yes. Why? Because there is no way of imperfectivising *posiedzieć* and *pospacerować* other than going back to *siedzieć* and *spacerować* respectively.

Class₃ verbs are a more complicated case — our classification claims that two formational operations are legitimate here: we can form aspectual twins using either an empty prefix or the delimitative prefix *po-*. For example, the verb *pisać* ‘to be writing’ can be prefixed by its empty prefix *na-* to form *napisać* ‘to finish writing’/‘to have written’. But it can also be prefixed by *po-* to form *popisać* ‘to have written for some time’. In both cases, the only way to undo the effect of the perfectivisation is to go back to the original verb. Hence (by appeal to the secondary imperfectivisation test) we view both *napisać* and *popisać* as aspectual siblings of *pisać*.

Class₄ verbs are even more interesting — our classification claims that three formational operations are legitimate here: they can either take an empty prefix, the delimitative prefix *po-*, or the semelfactive suffix *-ną-*. For example, from *pukać* ‘to

⁴It should be noted, that Bogusławski’s contributions to the prefixation issue are based on Russian, and not Polish. It seems that in Russian, aspectual triples can occur considerably more often than in Polish; some verbs that he uses as examples, do not occur in the corpus of Polish verbs (although they sound familiar to Polish native speakers). However, it should be noted that Russian secondary imperfective verbs seem to have iterative and not single episode reading.

be knocking' we can form *zapukać* 'to have knocked', *popukać* 'to have knocked for a while', and *puknąć* 'to have knocked once/briefly'. In all three cases, the only way to imperfectivise (with a single episode reading) is to go back to the original verb. Hence the secondary imperfectivisation test says that *zapukać*, *popukać* and *puknąć* are aspectual siblings of *pukać*. One final remark: *popukać* 'to have knocked for some time' can also be imperfectivized by insertion of the suffix *-iw-*, as a result of which the event of having knocked for a while is iterated: we get *popukiwać* 'to knock repetitively for some time'. But this verb does not have a single event reading.

Summing up, the secondary imperfectivisation test plays an important role for us: in the controversial cases (that is, in all cases that do not involve class₅ verbs) we use it as our touchstone to identify aspectual pairs and justify the judgments embodied in the classification. It allows us to avoid deciding when there has been a change of temporal meaning without an accompanying change of lexical meaning, and adds weight to our claim that the classification is essentially formal.

Indeed, so useful do we find the secondary imperfectivisation test as a basis for aspectual investigations, that we find ourselves unsatisfied with our original 'justification' that morphological change is an aspectual operation. Recall that we simply remarked that "any Polish native speaker (and indeed, any Polish linguist) would agree that morphological change is a process that gives rise to genuine aspectual pairs". This is certainly the received view — but what exactly is it that gives rise to this certitude? What exactly is it that conventional wisdom rests on here? We shall answer this by formulating a mirror image of the secondary imperfectivisation test that we call the *secondary perfectivisation test*:

The Secondary Perfectivisation Test

Let *perf-verb* be a perfective verb, and let *impf(perf-verb)* be an imperfective verb formed from it by morphological change. Then:

1. If the only way of perfectivising *Impf(perf-verb)* to obtain a verb with an single episode meaning is to return to the original verb (that is, *perf-verb*) then we say that *perf-verb* passes the secondary perfectivisation test, and that *Impf(perf-verb)* and *perf-verb* are aspectual pairs.
2. On the other hand, if *Impf(perf-verb)* can be perfectivised to a verb with single episode meaning by some other means, then we say that *perf-verb* fails the secondary perfectivisation test, and that *Impf(perf-verb)* and *perf-verb* are not aspectual pairs.

The secondary perfectivisation test pins down the pre-theoretical conviction that morphological change gives rise to aspectual pairs. For example, the perfective verb *kupić* 'to have bought' imperfectivises by morphological change to *kupować* 'to be buying'. How can we re-perfectivise? Actually, there aren't many options available here. We could apply the *po-* prefix, but this would yield the verb *pokupować* 'to be buying on several occasions', a distributive verb, not a single episode verb. If

we want a single episode perfective verb, we simply have no choice: we have to go back to *kupić*. We conclude that *kupić* and *kupować* are aspectual pairs. In short, the secondary perfectivisation test is a common sense formalization of the native speaker perception that two verbs belong together.

Moreover, the secondary perfectivisation test is obviously the mirror image of the secondary imperfectivisation test. That is, we have placed both directions of aspectual shift (from perfective to imperfective, and from imperfective to perfective) on the same methodological footing. We are viewing the entire Polish aspectual system in an essentially formal (and conceptually uniform) fashion.

Actually, we should add that in a certain sense we are duty-bound to introduce the secondary perfectivisation test. A traditional Slavic linguist need not bother to do so precisely because he or she uses suffixisation as inherently grammatical in a way that prefixisation is not. That is, by appealing to the theoretical distinction between prefixisation and suffixisation, the traditional Slavic linguist can avoid justifying the claim that suffixisation gives rise to aspectual pairs. However, the whole point of our formant-based approach is that we are committed to treating all formants, whether they be prefixations or suffixations, in a uniform way. So if we explained aspectual pairing for primitive imperfective forms in terms of the impossibility of having secondary imperfectives, we are duty-bound to explain aspect pairing in terms of impossibility to creating secondary perfectives. To put it in a nutshell, we have opted to work at a more abstract level of formants. Therefore, it is part of our task to devise criteria which work in a more uniform way at a more abstract level.

Now is an excellent time to explain our earlier remark that we don't like to explain the secondary imperfectivisation test (or for that matter, the secondary perfectivisation test) in terms of whether or not some non-temporal component of meaning has crept in. While this may be a helpful intuition pump, it puts the semantic cart before the morphological horse.

In our view, the interesting observation about Polish that requires explanation is that its verbs come in aspectual pairs (true, not all do, but the vast majority do, and Polish native speakers tend to 'think in pairs'). The secondary imperfectivisation and perfectivisation tests require no better justification than this: they are a superb way of making this observation precise. Indeed, not only do these tests require no justification in terms of "showing whether some non-temporal component of meaning has crept in", to think in such terms is (in our view) methodologically misguided.

The point is this. The four affixational possibilities on which our classification is based are justified in terms of the secondary imperfectivisation and perfectivisation tests. That is, we have given an essentially formal map of how different Polish verbs give rise to aspectual pairs. *Having done this, we are now free to move on and ask a more interesting question: which semantic distinctions are supported by aspectual distinctions?* Now, as it will become clear in the following section, we feel that the claim that aspectual pairs differ only in temporal meaning is an excellent approximation to the truth. Nonetheless, with at least two modifications that we regard as aspectual (namely delimitative *po-* prefixation, and semelfactive *-ną-* suffixation) it is possible to entertain doubts. To raise the kinds of doubts that have been raised in

the literature: doesn't delimitative *po-* seem to add a flavour of agentivity? And can the 'one time/briefly' reading that *-nq-* gives rise to truly be described as 'temporal'?

Now, we feel that both delimitative *po-* prefixation, and semelfactive *-nq-* suffixation are best thought of in temporal terms — but it is important to note that *such a view is not forced on us* (as we will see in the following chapter, it is straightforward to formalize their semantics in terms of simple models of eventualities on a flow of time). We do *not* start with the assumption that aspectual pairs “differ only with respect to the temporal component of meaning”. Rather, the whole point of our investigation is to formalize the notion of aspectual pairs (ultimately in terms of the secondary imperfectivisation and perfectivisation tests) and then to ask which semantic distinctions they actually give rise to. As it turns out, it seems to us that the distinctions they support are best described as temporal (indeed, it will turn out that the traditional binary opposition between ongoing and completed is fairly close to the truth) — but if it could be shown that some of the aspectual distinctions we have drawn change a non-temporal component of meaning as well, then that is perfectly acceptable (and indeed, very interesting). To repeat the mantra with which this chapter started: we want to see what distinctions the aspectual system *induces*. We don't want to start by assuming answers to subtle semantic questions.

Our methodological discussion is almost done. To close this section, let us change direction somewhat. Until now we have been emphasizing the formal nature of our classification. But it should be clear that our approach doesn't banish all semantic intuitions; rather, it attempts to control and minimize them. So what exactly are the semantic intuitions on which our classification rests? To put it another way, when we say that our classification is “essentially formal”, what is the content of the “essentially”?

Our approach presupposes the ability to make two main kinds of semantic judgment. Firstly, our approach assumes that native Polish speakers can judge whether there is an alternative to 'undoing' a perfectivising or imperfectivising operation on verbs that yield single episode readings. Secondly, our approach assumes that they can distinguish delimitative uses of *po-* from its use as an empty prefix. Now, the first of these abilities is the semantic expertise required to apply the secondary imperfectivisation test or the secondary perfectivisation test, and it seems safe to claim that Polish native speakers are capable of making such judgments.

The second semantic judgment required (distinguishing delimitative *po-* from empty uses of *po-*) also seems unproblematic. The delimitative use of *po-* is strongly 'felt' by native speakers. But unless it was pointed out to them, native speakers of Polish probably wouldn't notice that the empty prefix used to perfectivise *kochać* 'to be loving' (namely *po-*) is formally the same prefix as is used to give a delimitative reading to a verb like *krzyczeć* 'to be shouting'. An interesting verb in this respect is the class₃ verb *malować* 'to paint an object' (that is, it is equivalent to the Dutch *verven* rather than *schilderen*). Now, being a class₃ verb, this verb takes delimitative *po-*, and also has an empty prefix — and the interesting thing about this verb is that *po-* is its empty prefix. Thus both formants build the same derived form, namely *pomalować*. But although there is only one derived form, it has two distinct senses. The *pomalować*

formed using the empty prefix means to finish painting something. There is strong feeling of culmination, and moreover there is a distinct feeling of ‘aboutness’ — that is, there is some object or other that is being painted. Delimitative *pomalować*, on the other hand, means something like “to have been painting for some time and then to carry on with something else”. There is no sense of culmination, and no sense that anything in particular is being painted. That is, this verb focuses on the activity of painting — the object being painted fades from view. No native speaker would doubt that *pomalować* can mean two quite different things.

4.4 Induced semantic distinctions

In the previous section we classified Polish verbs by noting which of the four formational possibilities (empty prefixes, delimitative *po-*, semelfactive *-ną-*, and morphological change) they selected for. In constructing our classification we avoided the use of subtle semantic judgments (and in particular, we avoided claiming that these formants “changed the temporal meaning without affecting the lexical meaning”). Instead, we relied on two essentially formal criteria: the secondary imperfectivisation test and the secondary perfectivisation test. Our investigation lead us to classify Polish verbs into five classes, each class specified solely in terms of formational possibilities.

And now for the key claim of the chapter: although essentially formal, our classification induces a temporal classification of Polish verbs. In particular, we claim that the following generalizations hold: class₁ verbs are either *state* verbs or *gradual transition* verbs; class₂ verbs are *process* verbs; class₃ verbs are *culminating process* verbs; class₄ verbs are *unitisable process* verbs; and class₅ verbs are *culmination* verbs.

To put it another way, we claim that the Polish aspectual system encodes the distinction between states/gradual transitions, processes, culminating processes, unitisable processes and culminations. That is, we claim that our original classificatory table can be rewritten as follows:

	ep	<i>po-</i>	<i>-ną-</i>	mpc
state/gradual transition	yes			
process		yes		
culminating process	yes	yes		
unitisable process	yes	yes	yes	
culmination				yes

Or to put it in terms of Prolog, we claim that our Prolog code can be rewritten as follows:

```
state_or_gradual_transition(X) :- formant(X,ep(_),-po,-na,-mpc).
                               process(X) :- formant(X,-ep,po,-na,-mpc).
culminating_process(X) :- formant(X,ep(_),po,-na,-mpc).
unitisable_process(X) :- formant(X,ep(_),po,na,-mpc).
culmination(X) :- formant(X,-ep,-po,-na,mpc).
```

The remainder of this chapter is devoted to exploring this claim. In this section we make our claim more precise: that is, we shall explain what we mean by ‘pro-

cess verbs’, ‘culmination verbs’, ‘culminating process verbs’ and so on. Much of the temporal terminology we shall use when discussing these concepts (for example ‘culminations’, ‘culmination points’, and so on) is taken from the work of Moens and Steedman (1987, 1988). Some of the terminology we will use (notably states and process) is wide-spread in the aspectual literature; some of the terminology (notably culminations and culminating processes) is borrowed from Moens and Steedman (1987, 1988), and some of this terminology (notably gradual transitions and unitisable processes) was specially devised in an attempt to accurately describe the Polish data.

4.4.1 Class₅ verbs are culminations

If a verb is in class₅, it is perfective and is imperfectivized by means of a morphological change. For example, perfective *kupić* ‘to have bought’ becomes imperfective *kupować* ‘to be buying’ by replacing *i* by *owa*; perfective *wrócić* ‘to have come back’ derives its imperfective counterpart *wracać* ‘to be coming back’ by changing *i* to *a* (and in this case the vowel change is accompanied by an additional vowel change in the root). In Section 4.5 we shall describe in detail the kinds of morphological change that class₅ verbs undergo; here we wish to discuss their temporal semantics. We have claimed that class₅ verbs are ‘culminations’. What do we mean by that?

The (lexically encoded) temporal meaning of culmination verbs make reference to the notion of change: culminations lexically refer to a change of state that is instantaneous and has no degrees.⁵ Consider, for example, the perfective verb *kupić* ‘to have bought’. This refers to the moment of buying, the switch from “not yet belonging to the buyer” to “belonging to the buyer”.

The term ‘culmination’ is taken from Moens and Steedman (1987, 1988). Another term for class₅ verbs might be ‘achievements’, Vendler (1957). For example, *wygrać* ‘to have won’ (which imperfectivises by morphological change to *wygrywać* ‘to be winning’) is also a class₅ verb, and this example clearly suggests the intuition of achieving something. Nonetheless, the underlying notion of achievement is usually less vivid than this; consider, for example, *wrócić* ‘to have come back’ and its imperfective twin *wracać* ‘to be coming back’. The term ‘culmination’ (which conveys the idea that some critical time has been reached, without carrying the overtones of success that ‘achievement’ does) is more appropriate for such verbs, and hence we prefer Moens and Steedman’s terminology.

Culmination verbs have imperfective twins. What do these describe? Typically, the process that led up to the culmination point. That is, although Polish culmination verbs only refer to the culmination point, the process that led up to the culmination point is defined for culminations. Depending on the lexical semantics of the particular verb, it will be more or less plausible to explicitly refer to this preparatory process, and when it is plausible, this is what the imperfective form picks out.

⁵Such understanding of ‘change’ is inherent in the ‘Cambridge conception’ of ‘change’. This term refers to Russell’s definition of change in terms of a change of truth value of a proposition (Russell, 1913, page 442). The Russellian conception has become a standard way of defining ‘change’ in contemporary linguistic literature; see for instance Kamp (1979), Kamp (1980), Rothstein (2002).

For example, in Polish it is easy to refer to the process of coming back home or a process of buying fruits on the marketplace by using the imperfective forms *wracać* and *kupować* respectively. On the other hand, it is not so easy to refer to the process of recognizing a friend in a group of people on the other side of a pedestrian crossing using *rozpoznawać* (the imperfective form of *rozpoznać* ‘to recognise’). But the reasons for this seem non-linguistic; recognizing a person is a cognitive process that typically takes place very fast. We certainly can use *rozpoznawać* to refer to the process of recognition of the importance of a certain thing in one’s life (a process that is often too slow for comfort).

Our description of the temporal semantics of Polish culmination verbs unifies two different approaches to culminations/achievements which can be found in the linguistic literature. One approach says that achievements refer to an instantaneous change of state and do *not* refer to the process that might have led up to that change — see for example, Rothstein (2002). Another approach proposes that certain achievement verbs are preceded by a ‘durative prelude’ — see Kearns (1991), Delfitto and Bertinetto (1995), Delfitto (2002). To correctly describe the semantics of Polish culmination verbs we need *both* ideas: we need to say that while culmination verbs only refer to the culmination point, in their imperfective form they may very well refer to the process that led up to the culmination point, for this process is defined for them. If talking about this process is natural, as in case of events of ‘coming back’ or ‘buying something’, the imperfective forms denoting such processes (*wracać* ‘to be coming back’ and *kupować* ‘to be buying’) will primarily refer to one single (culminating) event being in progress. But because we usually do not think of a process of ‘recognizing somebody’ or ‘discovering a treasure’ as something that takes time, imperfective forms of verbs denoting such events (*rozpoznawać* ‘to be recognizing’ and *odkrywać* ‘to be discovering’) will tend to be interpreted as denoting a (temporally extended) event consisting of iterated single events of ‘recognizing’ or ‘discovering’.

Let’s go a little deeper into this point. Can verbs such as ‘recognizing somebody’ or ‘discovering a treasure’ be *forced* to take a single event reading? Yes, they can. For example, consider the sentence *Rozpoznawał ją przez pięć godzin* ‘It took five hours before he recognized her’. This makes perfect sense if it occurs as the climax of a detective story about a police surgeon examining a corpse in the city morgue. In essence, the supporting story is bending the meaning of the underlying verb phrase — we are being forced from the ‘default’ idea that recognizing a person is a fast process to the idea that recognition of a person can be a long, drawn-out, investigatory process. But in our view such a ‘reconstructed’ process (or, to use Rothstein’s terminology: ‘derived’ process (Rothstein, 2002, page 48ff.)) should not normally be viewed as forming a natural part of the event. Hence (contrary to Rothstein) we don’t believe that the possibility of a ‘forced’ interpretational effect should be taken as the characteristic semantic property of Polish culmination verbs. Additional semantic effects seem to be at work in such cases.

In a nutshell — no force required. The characteristic property of a culmination in Polish is that it *can* be explained as being the result of a (culminating) process. A process of recognizing the real meaning of a scientific theory, or the discovery of

an ancient city will usually take time, and it is natural to think and talk about such processes as developing towards a definite change — a change that introduces the consequent state of somebody having a deep understanding of all the implications of a theory, or of the whole ancient city being discovered. In Polish, this definite change is expressed lexically, namely by the (perfective) form of a culmination verb.

The reader should now have a reasonable understanding of what we mean by culminations. The reader may like to consider the following list of class₅ verbs and our claim that they are all culminations: *odkryć* ‘to have discovered’, *zdobyć* ‘to have reached the summit’ or ‘to have gained’, *osiągnąć* ‘to have achieved’, *podpisać* ‘to have signed’, *nagrać* ‘to have recorded’, *wygrać* ‘to have won’, *zauważyć* ‘to have noticed’, *odrzucić* ‘to have rejected’, *zmienić* ‘to have changed’, *zwyciężyć* ‘to have overcome’, *zmartwychwstać* ‘to have risen from the dead’, *dostać* ‘to have gotten’, *przyjechać* ‘to have arrived (in a vehicle)’, *odjechać* ‘to have left (in a vehicle)’, *wstać* ‘to have gotten up’, *otworzyć* ‘to have opened’, *zamknąć* ‘to have closed’, *zacząć* ‘to have started’, *skoczyć* ‘to have jumped’, *rozpaść się* ‘to have disintegrated (reflexive)’, and *zakochać się* ‘to have fallen in love (reflexive)’.

4.4.2 Class₄ verbs are unitisable processes

If a verb is class₄, it has three aspectual siblings: one formed by an empty prefix, one formed by the delimitative prefix *po-*, and one formed by the semelfactive suffix *-ną-*. For example, from *pukać* ‘to be knocking’ we can derive *zapukac* ‘to have knocked’, *popukać* ‘to have knocked for some time’, and *puknąć* ‘to have knocked once’; from *krzyczeć* ‘to be shouting’ we can derive *zakrzyczeć* ‘to have shouted’, *pokrzyczeć* ‘to have shouted for some time’, and *krzyknąć* ‘to have shouted out’/‘to have given a cry’. Note that in both examples just given, the empty prefix was *z(a)-*. This is not an accident — all verbs in Class₄ take *z(a)-* as their empty prefix (in Section 4.5 we investigate whether distinguishing *z(a)-* from other empty prefixes leads to a more fine-grained classification).

What is the temporal semantics of these verbs? We claim that class₄ verbs are what we call ‘unitisable processes’. We have chosen this name because we consider that the characteristic temporal property of such verbs is that they can be broken down into their ‘minimal instantiations’ or ‘minimal units’. But this leads to a question: the minimal unit of the eventuality is selected by the suffix *-ną-*, the *-ną-* suffix is usually called the semelfactive suffix, and the verbs formed with *-ną-* are traditionally called *semelfactive* verbs (this comes from the Latin *semel* ‘once’ and *facere* ‘do’). So why didn’t we call class₄ verbs semelfactivising verbs?

Because the traditional terminology is too crude: ‘semelfactive’ emphasizes the singularity of the event (that is, the fact that it happened once). But the temporal semantics of class₄ verbs is more subtle than this. The key intuition about verbs in class₄ is that they can be broken down into temporally minimal units. With some verbs (the verbs traditionally called ‘frequentative’ verbs) this naturally leads to a ‘one time’ (that is, semelfactive) reading. But with other class₄ verbs it does not.

Let’s return to the two examples given above: both *pukać* ‘to be knocking’ and

krzyczeć ‘to be shouting’ belong to class₄. The verb *pukać* is a typical example of the verbs called ‘frequentatives’ in the traditional Slavic literature (see for instance Isačenko (1962), Czochralski (1975)); ‘to be knocking’ can be thought of as describing a succession of continuously repeated individual (partial) eventualities. But this description is clearly inappropriate in case of verbs such as *krzyczeć* ‘to be shouting’, a non-frequentative class₄ verb. However both verbs belong to class₄, and hence both select for the same three kinds of aspectual affixation. So let’s take a closer look at the temporal effects these aspectual modifications have, and at how the distinction between frequentatives and non-frequentative lexical meaning interacts with them.

The perfective verb formed with the empty prefix *z(a)-* is the most neutral of the three: it emphasizes neither the minimal instantiation of the event nor its duration — it simply says that the event finished. That is, *zapukać* ‘to have knocked’ and *zakrzyczeć* ‘to have shouted’ simply say that the knocking and shouting events, respectively, finished; somebody knocked and shouted as much as he or she thought necessary, and this event was not interrupted.

On the other hand, the delimitative prefix *po-* stresses the duration of the event. The delimitative verbs *popukać* ‘to have knocked for some time’ and *pokrzyczeć* ‘to have shouted for some time’ say that the described events not only ended but that they also lasted for a while.⁶

And now for the verbs formed with the ‘semelfactive’ *-ną-* suffix: *pukać* becomes *puknąć* and in this case the semelfactive translation ‘to have knocked once’ is accurate. However *krzyczeć* ‘to be shouting’ becomes *krzyknąć* and this is better translated as ‘to have shouted out’ or ‘to have given a cry’. That is, this perfective verb signals that a brief shouting event took place. Clearly the difference in lexical meaning between frequentative and non-frequentative class₄ verbs is having an interpretational effect. If a verb describes a series of events, reference to its minimal unit will naturally result in reference to one single subevent of the series (the minimal unit of a knocking event is naturally understood to be a single knock). However if a verb does not describe an event consisting of series of small subevents, the reference to a minimal subevent is not so clearly defined; it will typically be understood to be an instance of an event of a brief duration.

The difference in lexical meaning between frequentative and non-frequentative class₄ verbs gives rise to some other semantic effects too. Let us look more carefully at the difference between forms with *-ną-* and those with the empty prefix *z(a)-*. According to native speaker intuitions, these two forms can often be used interchangeably; the only difference between them lies in the emphasis of the minimality of the event in case of the suffixed form. For example, *zapukać* ‘to have knocked’ differs from *puknąć* ‘to have knocked once’ in that the suffixed form emphasizes the singularity of the event; *zakrzyczeć* ‘to have shouted’ differs from *krzyknąć* ‘to have shouted out’/‘to have given a cry’ in that the latter emphasizes the fact that the event of shout-

⁶There is a subtle intuition about some delimitative verb: when used with phrases such as ‘knock at the door’, it suggests that the door was not opened after all, so somebody was knocking at a door (a few times), but without the desired result; however, if it is not a knocking at the door but a knocking on a table (say while trying to fix it) the suggestion of a not-achieved result does not arise. Nor does it arise with verbs such as *krzyczeć* ‘to shout’.

ing had a minimal duration. But since the minimal instantiation of a frequentative verb is exactly determined (it is one single knocking), and a typical knocking event consists of a series of such single knockings rather than of one single knocking, the difference between *puknąć* ‘to have knocked once’ and *zapukać* ‘to have knocked’ is likely to be more tangible than the difference between *krzyknąć* ‘to have shouted out’/‘to have given a cry’ by *zakrzyczeć* ‘to have shouted’. And indeed, this seems to be the way Polish works: in virtually all contexts *krzyknąć* ‘to have shouted out’/‘to have given a cry’ can be replaced by *zakrzyczeć* ‘to have shouted’, but replacing *puknąć* ‘to have knocked once’ by *zapukać* ‘to have knocked’ will typically require a specific context which makes it clear that the knocking event that is talked about does not (necessarily) consist of a series of small knockings.

The reader should now have a reasonable understanding of what we mean by unitisable processes. To recapitulate, what is important for the temporal semantics of these verbs is not the fact that they can be instantiated once, but that they can be instantiated with minimal temporal duration (which for some verbs implies that it happened once). In case of a knocking event, the nature of the action naturally gives rise to the ‘do once’ (semelfactive) reading. But in the case of a shouting event, the minimal unit reading cannot be satisfactorily paraphrased with the ‘do once’ reading.

The reader may now like to think about the following list of class₄ verbs: *tykać* ‘to be ticking (clock)’, *migać* ‘to be indicating (car signals)’, *machać* ‘to be signaling (with your hand)’ or ‘to be waving’, *mrugać* ‘to be blinking’, *kiwać* ‘to be nodding’, *pstrykać* ‘to be flicking’, *klikać* ‘to be clicking’, *trzepać* ‘to be shaking (something)’, *świstać* ‘to be swishing (noise made by leaves, branches, etc.)’, *szelestać* ‘to be rustling (discrete sound made by leaves, paper, etc.)’, *szeleszczeć* ‘to be rustling (continuous noise made by leaves, paper, etc.)’, *blyskać* ‘to be flashing’, *trąbić* ‘to be tooting (a horn)’, *gdakać* ‘to be clucking (sound made by hens)’, *kwakać* ‘to be quacking (sound made by ducks)’, *kwikać* ‘to be oinking (sound made by pigs)’, *krakać* ‘to be cawing (sound made by magpies or crows)’, *piszczeć* ‘to be peeping (bird-like noise)’, *skrzypieć* ‘to be cracking (noise made by knuckles or other bone)’, *chrapać* ‘to be snoring’, *chrzkać* ‘to be snorting’, *chrząkać* ‘to be clearing one’s throat’, *tupać* ‘to be stamping (one’s feet)’, *trzaskać* ‘to be slamming’, *wzdychać* ‘to be sighing’, *chrupać* ‘to be crunching’, *kichać* ‘to be sneezing’, *dmuchać* ‘to be blowing’, *krzyczeć* ‘to be shouting’, *gwizdać* ‘to be whistling’, *syczeć* ‘to be hissing’, and *klaskać* ‘to be clapping’.

Polish has some examples of class₄ verbs that come in both discrete and continuous versions, such as the two variants of the English verb ‘to rustle’ noted above. Another example (for which there seems to be no reasonable English equivalent) is the Polish verb *sykać*. This refers to the noise a snake makes when it is flicking its tongue in and out. But the English verb ‘to hiss’ does not translate this — hissing refers to the more continuous sound a snake can make, and Polish has a separate verb for hissing, namely *syczeć*.

4.4.3 Class₃ verbs are culminating processes

Class₃ verbs can take an arbitrary empty prefix or the delimitative *po-*. For example, a verb such as *pisać* ‘to be writing’ can be prefixed by an empty prefix to form *napisać* ‘to finish writing’/‘to have written’, or by the prefix *po-* to form *popisać* ‘to have written for some time’.

We call class₃ verbs ‘culminating processes’. The terminology is taken from Moens and Steedman (1987, 1988). In the work of Moens and Steedman a culminating process verb denotes a process which, if not interrupted, will normally lead to a concrete result. Attaining the result typically takes some time; it is not an instantaneous process. The process leading up to the result can be viewed as a series of small changes that ultimately lead to a definitive change of state. The time where this happens is called the ‘culmination point’. If a process reaches its culmination point, it (so to speak) exhausts itself; it comes to an end, for it has reached its natural completion.⁷

Before going further, however, one matter is worth emphasizing. Following Moens and Steedman (1987, 1988), we view the ‘culmination point’ as a *temporal* entity: it is the time that marks the completion of the process and the birth of the consequent state. Its temporal location need not be specified by the sentence, and there is no requirement that it be explicitly referred to. However, semantically, it has to be there — because the empty prefix (and every class₃ verb takes an empty prefix) asserts the attainment of the culmination point.

Why stress this point so heavily? Because some writers (notably, Verkuyl and Krifka) have analyzed the semantics of aspect in Germanic languages in terms which emphasizes the role of the direct object, and then tried to extend their object-based analyses to Slavic languages such as Polish. Moreover, as an examination of their writing shows, when they attempt to transfer their approach to Polish, for the most part they consider class₃ verbs (Verkuyl in addition considers some class₅ verbs). Now, the primary goal of this thesis is to argue that a verb-oriented perspective is needed to properly understand the Polish aspect system. So if we can make it clear just why a verb-oriented perspective is needed for class₃ verbs (the only class of verbs for which there is a noun-oriented rival) we shall have established our point.

Recall from previous chapters that Verkuyl and Krifka explain the difference between the English sentences *John wrote letters for an hour* and *John wrote a letter in an hour* in terms of the absence of a ‘culmination point’ for the first sentence: *Letters* denotes an unspecified quantity/is cumulative and so cannot limit the action. On the other hand *a letter* denotes a specified quantity/is quantized, so as soon as the letter is finished, the action is completed. Informally, we might say that in the theories of Verkuyl and Krifka, the direct object *a letter* acts as a sort of non-temporal counterpart to Moens and Steedman style culmination points, whereas the direct object *letters* cannot play this role. To put it another way, we might say that when it comes to aspectual issues, it is the “quantity” contributed by the direct object that plays the leading role — not the culmination time contributed by the verb.

⁷Our account of class₃ verbs arose by trying to relate the classification to the ideas of Moens and Steedman. Interestingly, however, similar intuitions about the verbs that we classify as culminating processes have been expressed by traditional grammarians; see for example Bogusławski (1963).

But in Polish it doesn't work this way: *either* sentence (with a quantificationally specified and unspecified direct object) can denote a completed or not-yet-completed action — it simply depends on whether the verb used in the sentence is perfective or imperfective. That is, in Polish we have four distinct possibilities *Jan pisał listy przez godzinę* 'Jan was writing letters for an hour' (incomplete) versus *Jan napisał listy w godzinę* 'John finished writing letters in an hour' (complete), and *Jan pisał list przez godzinę* 'Jan was writing (a) letter for an hour' (incomplete) versus *Jan napisał list w godzinę* 'John finished writing (a) letter in an hour' (complete). Note that (like its English equivalent) the bare plural *listy* 'letters' is not definite and not specific; that there must have been a *certain* number of letters written *at the moment of evaluation*, can only be inferred from the information that at that particular moment the action was completed (the information that is contributed by the use of the empty prefix). But Polish speakers don't need to know anything definite about the number of letters to understand the sentence *Jan napisał listy w godzinę* 'John finished writing letters in an hour' (complete). And given a temporal view of Polish aspect (and in particular if one thinks about the semantics of class₃ verbs in terms of Moens and Steedman's (1987, 1988) temporal culmination point) it is obvious why this should be so: the sentence simply asserts that at a particular point of time (namely, the culmination point, which occurred one hour after the writing process started) an unspecified number of letters had been written. This is considerably simpler than the Verkuyl/Krifka account (which postulates that the function of the empty prefix in this case is to act like a determiner on the non-specific object position, thereby rendering it fit to act as a non-temporal correlate of Moens and Steedman style culmination points). Quite apart from anything else, it is hard to see how this story could be generalised to other verb classes. As we have seen, empty prefixes play a temporal role in the semantics of class₄ verbs; it seems simplest to conclude that they play a temporal role with class₃ verbs too.

Having made this point, let's turn to the second formational option class₃ verbs allow, namely delimitative prefix *po-*. In the complex verb *popisać* 'to have written (for a while)' the process of writing is not regarded as leading to any result, and the complex verb *popisać* does not denote a completed action. That is, delimitative *po-* can be thought of as restricting the duration of the process to a certain unspecific but delimited period of time ('unspecific', because nothing special marks the end of the period).

The Moens and Steedman temporal ontology gives us a natural way of thinking about this: the processes referred to by the delimitative verb is 'stripped' from its (potential) culmination point. Indeed, in the following chapter when we formalise this semantic discussion, we shall deal with class₃ verbs by devising a simple model-theoretic distinction between 'stripped' and 'non-stripped' culminating processes.

The reader should now have a reasonably clear understanding of what we mean by culminating process verbs. Here are some more examples: *pisać* 'to be writing', *czytać* 'to be reading', *śpiewać* 'to be singing', *budować* 'to be building', *komponować* 'to be composing', *tworzyć* 'to be creating', *gotować* 'to be cooking', *myć* 'to be washing', *prasować* 'to be ironing', *piec* 'to be baking/to be roasting', *smażyć* 'to be frying', *polerować* 'to be polishing', *jeść* 'to be eating', *pić* 'to be drinking', *czyścić* 'to

be cleaning', *sprzątać* 'to be tidying', *rekonstruować* 'to be reconstructing', *farbować* 'to be coloring', *gotować* 'to be boiling', *rżnąć* 'to be cutting/harvesting (with great power)', and *stroić* 'to be tuning/ornamenting'.

4.4.4 Class₂ verbs are processes

Class₂ verbs can only be made perfective by the delimitative prefix *po-*. For example, from *siedzieć* 'to sit' one can derive *posiedzieć* 'to sit for a while', from *spacerować* 'to walk' one can form *pospacerować* 'to walk for a while'.

We call verbs belonging to class₂ 'processes'. Our processes include what is traditionally called 'processes' or 'activities' (for example, 'to work', 'to walk', and so on). Both subclasses behave in exactly the same way under applications of aspectual formants. Incidentally, Parsons views agentive 'to sit', 'to lie', and so, as processes (Parsons, 1990, page 188).

Here are some examples: *grać* 'to be playing', *mysleć* 'to be thinking', *chichotać* 'to be giggling', *leżeć* 'to be lying', *lizać* 'to be licking', *spać* 'to be sleeping', *plywać* 'to be swimming', *tańczyć* 'to be dancing', *wspinać się* 'to be climbing', *stać* 'to be standing (agentive reading)', *dyskutować* 'to be discussing', *rozmawiać* 'to be talking', *plotkować* 'to be gossiping', *siedzieć* 'to be sitting', *całować* 'to be kissing', *chłonać* 'to be absorbing', *ciągnąć* 'to be pulling', *cieknąć* 'to be leaking', *cisnąć* 'to be pressing', *grzęznąć* 'to be getting stuck (in mud)', *mknąć* 'to be running (poetic/literary)', *brnąć* 'to be wading', and *narzekać* 'to be complaining'.

4.4.5 Class₁ verbs are states or gradual transitions

Class₁ verbs are the most semantically varied of all. This class groups together two semantically quite distinct (though related) types of verb: states and gradual transitions.

State verbs

Many of the verbs in class₁ are state verbs. When state verbs are perfectivised by their empty prefix they become inchoative. That is, perfectivised state verbs refer to the beginning point of the state. For example, *kochać* 'to be loving' has as its twin *pokochać* 'to have started to love', *rozumieć* 'to be understanding' has as its twin *zrozumieć* 'to have started to understand', and *wierzyć* 'to be believing' has its twin *uwierzyć* 'to have started to believe'. So the temporal semantics of state verbs is rather special. With class₄ and class₃ verbs empty prefixes denote the completion of the event (and indeed empty prefixes act this way with the class₁ verbs that are gradual transitions, as we shall soon see). But with state verbs, the empty prefix has precisely the opposite temporal effect.

Here is a list of class₁ state verbs: *kochać* 'to be loving (someone/something)', *nienawidzić* 'to be hating', *wierzyć* 'to be believing', *ufać* 'to be trusting', *rozumieć* 'to be understanding', *martwić się* 'to be worrying', *weselić się* 'to be being joyful', *cieszyć się* 'to be being happy', *żałować* 'to be regretting', *lubić* 'to be liking',

chorować ‘to be being sick’, *szanować* ‘to be respecting’, *wielbić* ‘to be worshipping’, *czuć* ‘to be feeling’, *intrygować* ‘to be intriguing someone’, *dziwić* ‘to be making someone intrigued/curious/surprised’, and *podobać się* ‘to be pleasing’.

Gradual transition verbs

The remaining verbs in class₁ are what we shall call gradual transitions. This subgroup is subject to an interesting formational regularity: gradual transitions are all made perfective by means of a single empty prefix, namely *z(a)-*. For example, *grubnąć* ‘to be growing fat’ under application of the empty prefix *z-* becomes *zgrubnąć* ‘to have become fat’, and perfectivising *mądrzeć* ‘to be growing wise’ results in *zmądrzec* ‘to have become wise’. In Section 4.5 we examine the effect on our classification of distinguishing *z(a)-* from other empty prefixes.

But what about the semantics of gradual transitions? Dowty (1979) observes that a corresponding group of English verbs is closely related to analytic predicates of the type ‘get + comparative adjective’ (for example, *get older*, *fatter*, *colder*, and so on) (Dowty, 1979, page 88-90). Bertinetto and Squartini (1995) observe that the problem that these verbs pose can be reduced to the question whether the change they refer to is a matter of degree or whether it is something definite/instantaneous/indivisible (as in case of culminations) (Bertinetto and Squartini, 1995, page 13). On the basis of the Polish data we argue that neither of these two options is complete. Rather, the semantics of such verbs crucially involves both of these components as well as a third one: the reference to the (consequent) state.

Actually, gradual transition verbs are derived from descriptions of properties (recall from Chapter 1 that the Polish suffixes *-e-* and *-nąć-*, when used for word-formational purposes, are morphemes that derive verbs from adjectives and nouns). Intuitively, they can best be paraphrased as a gradual attainment of the state of having that property. We could describe gradual transition verbs as lexically referring to three temporal components: the consequent state, a series of gradual changes, and (by implication) a definite change (culmination point) that links the series of gradual changes with the consequent state. A gradual transition verb could be thought of as a morphological and semantic amalgam of culminating process, culmination and (consequent) state.

Like culminating processes, gradual transitions are imperfective: both refer to a process that gradually develops towards a culmination point. The attainment of the culmination point is asserted when culminating processes and gradual transitions are perfectivised by empty prefixes. However, in contrast to culminating processes, gradual transitions include the culmination point in their lexical meaning, and so they do not make it possible to refer to the process which lead up to it: if perfectivised they always assert the attainment of the culmination point. In terms of Moens and Steedman, a gradual transition does not make it possible to ‘strip’ the process from its culmination point (because the culmination point is incorporated by the verb’s lexical semantics). This is mirrored in the morphology: like culminations, gradual transitions do not combine with the delimitative *po-*. The growing fat process expressed by *grubnąć* ‘to be growing fat’, can be interrupted at any moment, and it will still have led (to some extent or other) to a consequent state of being fat, which is exactly what

is expressed when the perfective form of this verb, *zgrubnąć* ‘to have become fat’, is used.⁸

The three classes of culminating events are closely connected: if perfectivised they all become (or, can become) culminations. Yet, an imperfectivised culmination does not become a gradual transition, but culminating process. So the connection between gradual transitions and culminations is a one-way transition. Why is that? We think that the reason lies in the relationship that gradual transitions maintain with states. The state expresses a property. The change gradual transitions refer to is a change in a property, and a property may have different degrees. Consider once more the verb ‘to have become fat’: clearly, there are many degrees of being fat and which particular degree is achieved, and how, is highly context-dependent. To put it another way the ‘gradualness’ of gradual transitions seems to arise from their conceptually close affinity to states.

And indeed, the link between gradual transitions and states may go some way towards explaining what at first sight seems a semantic peculiarity of state verbs, namely that they have an inchoative reading when perfectivised by their empty prefix. The verb *grubnąć* ‘to be growing fat’ refers to a state-changing process, a movement towards a culmination point. This culmination point simultaneously marks the end of the becoming-fat process, and the *start* of the being fat process. So perhaps the starting point of a state is the natural one to mark after all. And interestingly, some verbs are ambiguous between a gradual transition and a state interpretation: for instance, *zielenić się* ‘to be growing green’, or *czzerwienić się* ‘to be turning red’. For instance, the Polish sentence *Pola zielenią się* can be translated into English as ‘(The) fields are being green’, or as ‘(The) fields are becoming green’. The former reading is a state reading, and the latter reading is a gradual transition reading. The interpretation of the perfectivising operation depends on these two readings: *Pola zazieleniły się* can be translated as ‘(The) fields have started to be green’, or ‘(The) fields have become green’.

But this is speculation, and it is time to move on. Before doing so, here is a list of gradual transitions for the readers to think about: *mądrzeć* ‘to be growing wise’, *głupieć* ‘to be becoming stupid’, *chudnąć* ‘to be losing weight’, *grubnąć* ‘to be growing fat’, *zielenieć* ‘to be growing green’, *czernieć* ‘to be becoming black’, *blednąć* ‘to be growing pale’, *starzeć się* ‘to be becoming old’, ‘to be aging’, *brzydnąć* ‘to be becoming ugly’, *czzerwienić się* ‘to be turning red’, *zielenić się* ‘to be growing green’, and *rumienić się* ‘to be blushing’.

⁸The incompatibility of gradual transitions with *po-* may also to a certain (but lesser) degree be conditioned by the fact that verbs belonging to this class are not agentive. The culmination point is not being reached through a persisting maintaining of the event — rather, it just happens to the experiencer. Hence, the oddness of **Jan skończył mądrzeć** ‘Jan finished growing wise’. Verbs formed with *po-* often have an overtone of agentivity.

4.5 Can we extend the classification?

We have seen that our formationally-driven classification of Polish verbs embodies considerable semantic content. But have we been fine-grained enough? Maybe it is possible to extend the classification further — and two directions for further exploration immediately suggest themselves. First, as we have just seen, our classification puts states and gradual transitions in the same group. Is it possible to extend the classification in a way that will tease them apart? Second, there is an obvious asymmetry in the classification: imperfective verbs are split into four classes, but the perfective verbs that are not formed by affixation from verbs in class₁ – class₄ are all lumped together in class₅ (culminations). Is there additional morphological structure within this class that carries interesting temporal information?

In this section we examine both issues. First we consider two (very different) attempts to distinguish states from gradual transitions. We then turn our attention to class₅. As we shall see, the formational possibility that we have called ‘morphological change’ is a complex process. Nonetheless, as far as temporal information is concerned, it turns out to be semantically uniform.

4.5.1 Distinguishing states from gradual transitions

There is an obvious way of distinguishing states from gradual transitions. While the classification places them both in class₁ (that is, they are both perfectivised by empty prefixes) the temporal effect of their empty prefixes is completely different. In the case of states, perfectivisation yields an inchoative verb (that is, it signals the beginning of the state). With gradual transitions on the other hand, it signals the completion of the transition.

This means, of course, that we can distinguish states from gradual transitions by using a single semantic feature (let us call it *inc*) to signal whether or not the empty prefix has an inchoative effect or not. Doing this leads to the following table:

	ep(<i>inc</i>)	ep(- <i>inc</i>)	<i>po-</i>	<i>-nq-</i>	mpc
state	yes				
gradual transition		yes			
process			yes		
culminating process		yes	yes		
unitisable process		yes	yes	yes	
culmination					yes

It is straightforward to capture this extension in Prolog. First, recall our previous rule for states/gradual transitions:

```
state_or_gradual_transition(X) :- formant(X,ep(_),-po,-na,-mpc).
```

Next, let us mark in the lexicon those verbs which have an inchoative reading when perfectivised by their empty prefix. In our toy lexicon, this means adding the following information:

```
ep_inc(kochac).
ep_inc( rozumiec).
ep_inc(ufac).
ep_inc(wierzyc).
```

With this information at our disposal, we split states and gradual transitions apart as follows:

```
state(X) :- formant(X,ep(_),-po,-na,-mpc),
            ep_inc(X).
gradual_transition(X) :- formant(X,ep(z(a)),-po,-na,-mpc),
                        \+(ep_inc(X)).
```

The first rule says that a verb is a state if it has the formational properties of a class₁ verb, and has an inchoative reading when perfectivised by its empty prefix. The second rule says that a verb is a gradual transition if it has the formational properties of a class₁ verb, and does *not* have an inchoative reading when perfectivised by its empty prefix (note the use of `\+`, Prolog's inbuilt negation-as-failure, to formulate the latter constraint).

This works correctly. Posing the query

```
?- state(V).
```

extracts all the state verbs (that is, *kochac*, *rozumiec*, *ufac*, and *wierzyc*), and posing the query

```
?- gradual_transition(V).
```

extracts all the gradual transition verbs (that is, *blednac*, *ciemniec*, *grubnac*, and *madrzec*).

This is pleasant: the original classification does most of the work for us, and then we capture the required change with single addition. Moreover, the distinction between class₁ verbs that receive an inchoative reading when perfectivised and those that do not is a relatively robust distinction: while some semantic distinctions are fuzzy, this one is clear.

Nonetheless, note that the resulting classification can no longer be called formationally driven. The distinctions drawn in our original table were established by appealing to essentially formal criteria (the secondary imperfectivisation and secondary perfectivisation tests). Because of this we could claim that the semantic distinctions discussed in the previous sections were induced, not imposed. But we cannot say the same thing about the *inc*-based distinction we have just drawn between states and gradual transitions. No formal morphological test underpins this distinction: it is based on an purely semantic decision, namely whether or not a class₁ verb has an inchoative reading when perfectivised by its empty prefix. To put it another way, we *imposed* this distinction. We are here drawing a Vendler-style distinction in the traditional (semantic) way. There is nothing wrong with doing this (in fact, we think it is the probably sensible way to proceed in this case) but it is important to be aware that this is what we are doing.

Given this, it is interesting to try again. Is it possible to distinguish states from gradual transitions in a manner more in keeping with our original classification —

that is, in terms of formational transformations licensed by the secondary imperfectivisation test? As we shall now see we come tantalizingly close to doing precisely this.

The key observation was made in the previous section: gradual transitions always take *z(a)-* as their empty prefix. Now, the *z(a)-* prefix is rather special: it is the prefix very often used as an empty prefix in Polish (and accordingly it is more grammaticalized than any other empty prefix). Moreover, as Bogusławski notes, it is hard to ascribe to this prefix any ‘individual’ (that is, lexical) meaning; all its uses seem to be genuinely ‘empty’ (Bogusławski, 1960, page 105). So: what happens if we distinguish *z(a)-* from other empty prefixes? We obtain the following table:

	ep (not <i>z(a)-</i>)	<i>z(a)-</i>	<i>po-</i>	<i>-ną-</i>	mpc
state	+	+			
gradual transition		yes			
process			yes		
culminating process	+	+	yes		
unitisable process		yes	yes	yes	
culmination					yes

The first things to note about this table are rows 2 and 4. Row 2 records the fact that (as we just mentioned) gradual transitions always use *z(a)-* as the empty prefix. And now note row 4: this records the fact (also noted in the previous section) that unitisable processes are subject to the same formational regularity. To put it another way, what this table shows is that only two classes of verbs in Polish are allowed to vary with respect to the empty prefixes they can take, namely states verbs and culminating process verbs.

The next thing to notice are the occurrences of ‘+’ in the table. These are used to indicate that states and culminating processes can take either arbitrary empty prefixes or *z(a)-*. That is, whereas the ‘yes’ used in the other rows is conjunctive, ‘+’ is disjunctive.

The table suggests that *z(a)-* may play some role in distinguishing states from gradual transitions. But it is important to note that the table is *not* a classification of Polish verbs in the strong sense used earlier. That is, this table does *not* have the same status as our original classification. Why not? Because, unlike our original classification, it does *not* provide necessary and sufficient conditions strong enough to assign each Polish verb (to which it applies) to a unique class. It is a classification of Polish verbs, but a weaker one.

To see why, note that the (disjunctive) information given in row 1 of the table is not strong enough to distinguish states from gradual transitions. For example, suppose we are given a gradual process verb (for example *grubnąć* ‘to be growing fat’) or a state verb that takes *z(a)-* as an empty prefix (for example *rozumieć* ‘to understand’). All that the information in the table lets us conclude is that both verbs are either state verbs or gradual transition verbs. Of course, in some cases the table does let us do more. For example, if we are given a verb like *wierzyć* ‘to believe’ (a state verb that

takes *u-* as its empty prefix) the disjunctive information given in row 1 does do some extra work for us, and correctly classifies this verb as a state.

We can make the point more vividly by examining the Prolog corresponding to this table. The required Prolog code is simplicity itself to write: to distinguish the effect of *z(a)-* from other empty prefixes, we only need to make two small changes. First, we replace our previous rule for unitisable processes; that is, we replace

```
unitisable_process(X) :- formant(X,ep(_),po,na,-mpc).
```

by the following variant:

```
unitisable_process(X) :- formant(X,ep(z(a)),po,na,-mpc).
```

Note that `ep(_)` has been replaced by `ep(z(a))`; that is, the new rule insists that the only allowable empty prefix is *z(a)*. In a similar vein, we replace the rule

```
state_or_gradual_transition(X) :- formant(X,ep(_),-po,-na,-mpc).
```

by the following two rules

```
state(X) :- formant(X,ep(_),-po,-na,-mpc).
gradual_transition(X) :- formant(X,ep(z(a)),-po,-na,-mpc).
```

Note that in the rule for gradual transitions we insist that the only allowable empty prefix is *z(a)-*.)

So far so good — these changes obviously capture the effect of the previous table. But it should be clear that these rules are *not* strong enough to tease states and gradual transitions apart. For a start, note that any verb which satisfies the criteria demanded of gradual transitions automatically satisfies the criteria demanded of gradual transitions — after all, `ep(z(a))` is just a special case of `ep(_)`. Thus posing the query

```
?- state(V).
```

will still extract all the `class1` verbs, the gradual transitions included. Furthermore, note that any state verb which takes *z(a)-* as an empty prefix also satisfies the criteria demanded of gradual transitions. Thus posing the query

```
?- gradual_transition(V).
```

extracts not only all the gradual transitions in our toy lexicon (namely *blednac*, *ciemniec*, *grubnac*, and *madrzec*), but also two state verbs (namely *rozumiec* and *ufac*).

Of course (as we mentioned when discussing the table) in some cases distinguishing *z(a)-* from other empty prefixes does yield more information. For example, consider the following two queries:

```
?- state(wierzyc).
Yes

?- gradual_transition(wierzyc).
No
```

That is, the program correctly concludes that *wierzyc* is a state and not a gradual transition verb. (A similar dialogue establishes the same for *kochac*.)

So it is clear that isolating *z(a)-* from the other empty prefixes does not provide a formal basis for fully distinguishing states from gradual transitions. Nonetheless, as we said before, it comes tantalizingly close. The only verbs which spoil this regularity are states verbs which take *z(a)-* — and in fact, we have only been able to find a few such verbs. It would be interesting to do some further corpora-based work here to determine exactly which Polish verbs are exceptions to the regularity just noted.

4.5.2 Morphological change in Polish

In our classification, all basic perfective verbs are lumped together in class₅ (that is, culminations). Should we rest content with this, or is there additional morphological structure here that carries semantic import?

This is an important question to examine. Many writers on the subject treat what we have called morphological change as if it were morphologically simple and uniform; indeed, some write as if insertion of the *-yw-* suffix is all that is involved. As we shall see, however, morphological change is a more complex process than that. Moreover, such changes can have semantic import; for example, we noted in Section 4.2 that adding a *-yw-* suffix to *pisać* ‘to (be) writ(ing)’ yields the iterative/habitual verb *pisywać* ‘to write from time to time/have a habit of writing’. All of this adds force to the question we have just posed: does any of this additional morphological here carry semantic import of relevance to our classification?

Recall that ‘morphological change’ is Czochralski-inspired terminology. What exactly does it cover? Synchronically, the process can be analyzed into four components: we call these components *vowel insertion*, *vowel change*, *suffix insertion* and *suffix change*. Let us now define these terms. We first observe that Polish infinitives generally end with *ć*, and the few that do not end in its phonological variant *c*. Then:

- If an *a* is added before the infinitive ending (*ć* or *c*), and no other change is made to the (perfective) infinitive, we talk of *vowel insertion*.
- If the last vowel of the infinitive is changed to *a*, we talk of *vowel change*.
- If the infinitive ends with ‘*vowel c*’ or ‘*vowel vowel c*’ and we replace the vowel sequence by a unit of the form ‘(*vowel*)*consonant a*’ we talk of *suffix insertion*. Here the brackets around *vowel* means that the added vowel is optional. The consonant used is mostly a *w*, but it can also be *g, j, k, m, n*, or *t*; the vowel (if one is added) will be either *a, e, o, i*, or *y*.
- If the infinitive ends with *-nć*, and we replace the *n* by some string (including the empty string) we talk of *suffix change*. In fact, there are only eight possible replacements strings in Polish (the empty string is one of them) and these are listed in the table below. We remark that *-nć* is a suffix, but in case of verbs that undergo morphological change it is a word-formatational, *not* an aspectual morpheme.

These four cases cover all the regular changes, but for the sake of non-Polish speakers we should mention that vowel and suffix change or insertion can also be accompanied by irregular consonant change and vowel change within the root of the infinitive. It is not worthwhile listing all the possibilities here, but it's worth knowing that as a rule, it is the vowel in the last stem syllable that undergoes a change. In particular, it is the vowel *o* (and sometimes the *ó* that developed from *o*) of the perfective stem that is replaced by *a*. For more information, see (Czochralski, 1975, page 85).

The regular morphological and phonological alternations between perfective and imperfective verbs are given in the following table, which is based on the results of Czochralski's investigations of Polish verbs. The final line of the table lists all eight possible strings that can enter in suffix replacement.

perfective ending	imperfective ending
ć	wać, ać
ić	ać, ować
yć	ać, ywać, iwać
ać	ywać, iwać, awać, ewać
ąć	ywać, inać, ynać, ymać
eć	ać, ywać, ewać
oić	ajać
aić	ajać
eić	ejać
ec	ekać , egać
óc	agać
ąc	ęgać
nąć	ać , wać, ywać, iwać, kiwać, tywać, tać, jać

The next table gives some concrete examples of these morphonological changes in action. If there are two examples given of an alternation type, the first is a regular example, and the second is an example accompanied by additional vowel and/or consonant changes within the root (that is, it is an irregular example). There are far fewer morphologically simple than complex verbs that undergo morphonological alternations (by "morphologically complex" verbs we mean verbs prefixed by a lexical prefix). So if an alternation is illustrated with a prefixed verb only, it means that there are no simple verbs that do undergo that particular morphonological change.

Alternation	Polish example	English translation
ć-wać** ć-ać	dać-dawać (1) skupić-skupiać (2) zabawić-zabawiać	to give (1) to buy (back)/ to concentrate; (2) to entertain
ić-ać ić-ować!*	(1) rzucić-rzucać; (2) wrócić-wracać kupić-kupować	(1) to throw; (2) to come back to buy
yć-ać yć-ywać** yć-iwać*	(1) zwyciężyć-zwycięzać; (2) stworzyć-stwarzać; (1) dobyć-dobywać*!; (2) rozpatrzeć-rozpatrywać wskoczyć-wskakiwać	(1) to win a victory (2) to create (1) to reach out for something (2) to consider jump in
ać-ywać ać-iwać ać-awać* ać-ewać**	zaniedbać-zaniedbywać podслушать-podслушиwać zmartwychwstać-zmartwychwstawać nadać-nadziwać	to neglect to overhear, to eavesdrop to rise from the dead to impale, to skewer, to stuff
ąć-ywać ąć-inać* ąć-ynać* ąć-ywać*	spocząć-spczywać przeciąć-przecinać zacząć-zaczynać nadać-nadywać	to take a seat, to rest to cut through to begin to puff out
eć-ywać* eć-ewać**	przewidzieć-przewidywać przejrzeć-przejrzawać	to foresee to see through
ec-ekać** ec-egać*	przeciec-przeciekać sposzrec-sposrzegać	to leak (out) to notice
óc-agać* ąć-ęgać*	przemóc-przemagać przysiąc-przysięgać	to overcome to swear
nąć-ać** nąć-wać* nąć-ywać** nąć-iwać** nąć-kiwać* nąć-tywać* nąć-tać!* nąć-jać!*	(1) wybuchnąć-wybuchać; (2) wchłonąć-wchłaniać odfrunąć-odfruć nagabnąć-nagabywać wstrzyknąć-wstrzykiwać rozbłysnąć-rozbłyskiwać nadepnąć-nadeptywać dorosnąć-dorastać minąć-mijać	(1) to explode; (2) to absorb to fly away to pester sb for sth to inject to flash out to step (on sb's foot) to grow up to pass

The ‘*’ marks alternations that are very exceptional and include up to five simple verbs/bounded morphemes; ‘**’ covers up to 15 simple verbs/bounded morphemes undergoing a particular derivation. The ‘!*’ means that only one simple verb or one bound morpheme undergoes the particular alternation.

Clearly there is a lot more to deriving an imperfective form from a basic perfective form than simply inserting *-yw-*. Moreover, the morphological operations noted in the above table have other semantic effects in Polish besides imperfectivising perfective verbs; in particular, they can also be used to form iterative/habitual verbs. In spite of this, none of this additional morphological structure is relevant to our aspectual classification of Polish verbs. Why not?

Morphological change ‘feels’ like a uniform process to Polish native speakers. When forming imperfective verbs out of perfective verbs, native speakers are not usually aware of what exactly it is that they are changing — for example, whether the change does or does not involve a consonant.

Now, this feeling might well be mistaken, and it is clear that we cannot regard it as sufficient evidence to let us conclude that there is no further aspectually relevant distinctions to be drawn within class₅. But an inspection of the data supports these intuitions. Whether we compare verbs that make use of vowel change with verbs that make use of vowel insertion, or verbs that make use of suffix change with verbs that make use of suffix insertion, nothing seems to have any effect: there is no evidence that the fine structure of morphonological supports any semantic distinctions. The choices native speakers instinctively make between vowel change/insertion and suffix change/insertion seem purely phonologically constrained.

We draw the following conclusion. The details of Polish morphonological change are indeed complex. Nonetheless, there is nothing to be gained by drawing more fine-grained morphological distinctions within in class₅.

4.6 Summary

Let us summarise what we have done in this chapter. We isolated four formational operations, and classified Polish verbs into five classes on the basis of the formants they select for. We isolated these particular operations because they are the operations that give rise to aspectual pairs in Polish. Our concept of ‘aspectual pair’ was essentially formal, not semantic: it was defined in terms of the secondary perfectivisation and imperfectivisation tests. In spite of this, our formationally driven classification induced interesting temporal distinctions on Polish verbs. In fact, we argued that the five formationally defined classes give rise to what we called (drawing on Moens and Steedman terminology) culminations, unitisable processes, culminating processes, processes, and states/gradual transitions. We then investigated the possibility of inducing further formationally driven distinctions on class₁ Polish verbs. We noted that the *z(a)-* prefix gave us a partial grip on the distinction between states and gradual transitions. Further, we concluded that the class₅ verbs (culminations) could not be semantically subdivided by making use of the fine structure of morphonological change.

Chapter 5

A Closer Look at the Classification

The verb classification introduced in the previous chapter can only be regarded as a first step in the exploration of Polish aspect. A full account would need to consider how verbs make their aspectual contribution to the verb phrase and sentential levels, an investigation which would have to consider (among other things) how aspect interacts with tense, and how aspect interacts with quantification (the parallelism-based approaches discussed in the previous chapter raise interesting questions which any approach to aspect will have to address eventually). Nor could a full examination of aspect in Polish rest at the sentential level: many of the most interesting effects of aspect occur at the discourse level. Unfortunately, addressing these topics in anything like an adequate way would require a thesis at least twice as long as the present one.

Nonetheless, although such topics lie beyond its scope, this thesis is driven by the conviction that in order to adequately explore aspectuality in Polish at the sentential and discourse levels it is crucial to get a firm handle on how Polish aspect functions at the verbal level, and in particular to get a firm grip on the role of verb pairing. That is, the verb classification we have proposed is not intended as an end in itself, it is intended to be a building block for further investigations of aspectuality in Polish. Thus although we cannot discuss aspectuality in Polish at the sentential and discourse levels here, it is important to at least try to address a preliminary question: just how good a building block is the verb classification likely to be?

This question needs to be addressed from a number of perspectives. We shall proceed as follows. In Section 5.1 we consider the coverage of the classification. We have claimed its coverage is wide, but it is important to be more precise than this. Where, and to what extent, does it break down? In Section 5.2 we turn to a theoretical issue. Our classification makes free use of empty prefixes, but this concept has been criticised in recent (Western) aspectual literature, and has long been controversial in the Slavic literature. Some readers may feel that our use of them undermines our classification;

we argue that it does not. In Section 5.3 we return to the verb semantics induced by our classification. In the previous chapter we sketched this semantics informally. Here we shall show that the main semantic distinctions induced by the classification are amenable to formalisation: we do so by providing a simple modal-style semantics for the various classes of verbs. In Section 5.4 we take a brief look at the level of verb phrase. Although this thesis is mostly concerned with the lexical semantics of verbs, it is interesting to consider what happens at higher syntactic levels, and we make some preliminary observations on this topic here by applying some adverbial modification tests for the literature. In Section 5.5 we discuss the classification from a diachronic perspective. In Section 5.6 we conclude.

5.1 Coverage

When we defined the classification we said that it was intended to provide necessary and sufficient conditions strong enough to assign every Polish verb *to which it applied* to a unique class. We also remarked that the classification was not intended to apply to modal verbs, habitual/iterative verbs, or verbs that come in suppletive pairs. Our first task here will be to discuss these limitations. With this done, the way is clear to address the obvious question: have we really classified all remaining Polish verbs? We investigate this claim by drawing on data given in Czochralski (1975).

5.1.1 Modals, habituals, and suppletive pairs

There are three types of verb to which the classification is not intended to apply: modal verbs, habitual/iterative verbs, and verbs that come in suppletive pairs. Our reason for excluding the modal and habitual/iterative verbs from the classification are semantic: these verbs are atemporal, and in particular, they do not have a single episode reading; unsurprisingly they do not come in (aspectual) pairs. Our reason for excluding verbs which come in suppletive pairs is morphological: such pairs simply do not have the type of formational structure that our classification makes use of.

The modal verbs of Polish are *móc* ‘can/may’ and *musieć* ‘must/should/have to’.¹ Modal verbs play an auxiliary role in Polish just as they do in English, and aspectual concepts aren’t semantically relevant to them. The Polish modals just listed are standardly classed as imperfective, but this is for diachronic and morphological reasons; none of them has a perfective partner. The following analogy may be helpful: the situation here is rather like what happens with tense inflection in English modals. It is sometimes said that English modals such as ‘may’ or ‘must’ only have a present tense form; it would be more accurate (at least from a semantic perspective) to say that they come in a single form that can be used in any English tense construction. That is, English modals come in one atemporal form, and Polish modals do too. Hence their exemption from the classification.

¹To be more precise, the Encyclopedia of the Polish Language divides “modal predicates” into three groups: regular modal verbs (namely, *móc* ‘can/may’ and *musieć* ‘must/should/have to’); suppletive modal predicates (which occur only in two forms); as well as uninflected forms.

Polish has a small number of habitual/iterative verbs such as *pisywać* ‘to write from time to time/have a habit of writing’. Such verbs can be inflected for tense, but they are atemporal in precisely the sense we used when defining the secondary imperfectivisation and perfectivisations tests: they are not verbs with a single episode meaning, hence we exclude them from the classification too. There are not many habitual/iterative verbs in Polish. As we said in Chapter 2, Czochralski (1975) argues that the number of iterative verbs is very small, and he argues that the iterative verbs and the simple imperfective verbs from which the iterative were derived by means of *-yw-* should be treated as independent lexical items. As he puts it, iterative verbs are ‘fossilized verbs with an iterative modification sort’.

...Es gibt nämlich nur wenige Verben dieser Art. Daher ist es wohl angemessener, sie als erstarrte Verben mit iterativer Modifizierungsart anzusprechen. (Czochralski, 1975, page 23)

There is a handful of Polish verbs that come in suppletive pairs. That is, there is no morphological link between the two verbs in the pair — they are two completely distinct forms. For example the imperfective verb *brać* ‘to be taking’ has as its aspectual twin the perfective verb *wziąć* ‘to have taken’, and the perfective verb *przejsć* ‘to have crossed’ or ‘to have passed’ has as its imperfective twin *przechodzić* ‘to be crossing/passing’. Clearly the formational concept on which our classification is based does not apply to such verbs.

5.1.2 Other verbs

Now that we know exactly which verbs the classification is intended to apply to, it is time to address the obvious question: does it successfully classify all non-modals, non habitual/iteratives, and non suppletive pair forming verbs?

To answer this question we examined the data given in Czochralski (1975). Czochralski’s work is based on an analysis of a corpus of 9,000 Polish verbs, together with instances of their distribution (Czochralski, 1975, page 11). The corpus was constructed by Czochralski himself, and contains data from Polish of the 1960s. An examination of this corpus shows that there are other verbs that our classification does not cover, or does not cover completely. Let’s see what we have missed out.

First, there are three frequently used stative verbs which cannot be made perfective: *być* ‘to be’, *mieć* ‘to have’, *wiedzieć* ‘to know’. When a perfective form is required for these verbs, Polish speakers use a semantically closely related verb to paraphrase. For example, an imperfective sentence built using *być* ‘to be’ may be paraphrased into the perfective using ‘to become’: *Jan jest szczęśliwy* ‘Jan is happy’ can be perfectivise-by-paraphrase to *Jan stał się szczęśliwy* ‘Jan has become happy’. Similarly *Jan ma gęś* ‘Jan has a goose’ can be perfectivised by paraphrase to *Jan dostał gęś* ‘Jan has got a goose’. Similarly, *Jan wiedział o tym* ‘Jan knew about it’ can be perfectivised by paraphrase to *Jan dowiedział się o tym* ‘Jan got to know about it’.

Given what we know about statives, we would probably predict that they should be class₁ verbs (that is, that all three verbs should perfectivise using an empty prefix).

But there is no mechanism for perfectivising these verbs whatsoever, hence our classification does not cover them. Perhaps this is not very surprising in the case of 'to be', (as in many Indo European languages, this verb plays important auxiliary roles in Polish, so perhaps we should simply have ruled it out from consideration), but that 'to have' and 'to know' are not classified, is odd.

There are a few culmination verbs that according to Czochralski do not have imperfective partners. However, Czochralski's claims are open to dispute. For example, he says that the verb *żachnąć się* cannot be imperfectivised. (This reflexive verb is hard to translate: it means something like 'to have reacted with discontent to something/someone' or perhaps 'to have annoyed oneself because of someone else'.) But some Polish speakers find *żachać się* perfectly acceptable. And indeed the 'Dictionary of Correct Polish' ("Słownik poprawnej polszczyzny") does include this imperfective verb (Doroszewski, 1977, page 1041). In a similar vein, Czochralski says that the verb *przeżegnać się* 'to have made the sign of the cross (reflexive)' cannot be imperfectivised. However, imperfective form of *przeżegnać się* 'to have made the sign of the cross (reflexive)', namely *przeżęgnywać się* 'to be making the sign of the cross (reflexive)', seems to reasonably common in oral Polish. Also, Czochralski says that *zwichnąć* 'to have dislocated (one's shoulder)' cannot be imperfectivised. This is disputable. In principle, it is possible to derive an imperfective form of this verb. However, on semantic grounds, an imperfective verb of *zwichnąć* 'to have dislocated (one's shoulder)', namely *zwichać* 'to be dislocating (one's shoulder)', is not often needed, and hence, not often created. Moreover, since this verb refers to an instantaneous change of state, its imperfective form tends to be interpreted in iterative terms. In general, it seems that imperfective twins of culmination verbs that refer to events with a very short duration, are rather rarely used. Some of them require a special context of use, and some of them are forced into iterative reading.

The examination of Czochralski's corpus revealed some other verbs that our classification cannot handle. They are formed by prefixation of a perfectly normal process verb *brnąć* 'to be wading'. Now, from this verb we can form *przebrnąć* 'to have crossed through (with difficulty)', *wybrnąć* 'to have got out (with difficulty)', *dobrnąć* 'to have covered the final stretch (with difficulty)', and *zabrnąć* 'to have waded'. These are clearly all culmination verbs, and hence we predict that they should belong to class₅. But they don't: they can't be imperfectivised by morphological change, or indeed any mechanism whatsoever (imperfectivisation is also made difficult by the phonological structure of these verbs). So if we need an imperfective twin of these verbs, we simply use the basic imperfective verb. For instance, *Jan przebrnął przez problemy* 'Jan has managed to have crossed through the problems' is imperfectivised to *Jan brnął przez problemy* 'Jan was crossing through the problems'; *Jan dobrnął do celu* 'Jan has managed to reach his goal' is imperfectivised to *Jan brnął do celu* 'Jan was making an effort to reach his goal'. Note that these verbs combine with prepositional phrases, and that the preposition corresponds to the prefix. From the point of view of the evolution of prefixes in earlier stages of Polish, it seems that the prefixes in these verbs are not completely grammaticalised; they seem to retain much of their prepositional content. However, this seems to be different with prefix *z(a)-*. It is hard

to ascribe any prepositional content to the ‘z(a)-’ prefix; the complex perfective verb *zabrnąć* ‘to have waded’ seems to differ from the basic imperfective verb *brnąć* ‘to be wading’ only in that it expresses that the process of wading has been finished.

There is also an interesting group of verbs involving suffix *-nąć*.² It seems that this suffix is strongly associated with momentaneous events, and is extremely productive as a perfectivising formant. The perfective verbs involving this suffix can be classified either as unitisable processes or culminations. This means that the suffix can be regarded as a perfectivising formant or a word-forming morpheme. The decision as to how to classify a verb containing such a suffix depends on the formational possibilities that the new verb enters into.

Suffixation by *-nąć* is so vivid and tangible to native speakers that they sometimes use it outside of the regular patterns, especially when they wish to emphasise the momentaneity of an event, of the fact that an event culminated. Such verbs are used in colloquial language first, but many of them may later settle down. Consider the imperfective verb *fundować* ‘to treat (to invite someone out and pay for him)’. In standard Polish, this is a regular culminating process verb, which takes an empty prefix (namely *za-*) and delimitative *po-*. However, recently there arose another related verb: namely, *fundnąć*. As Czochralski remarks, *fundnąć* is a marked use, and it is typically used in young people’s colloquial conversation. To a native speaker this form feels as if it emphasizes the actual moment of paying for somebody, and it is clearly perfective. As its imperfective twin, native speakers would use *fundować*. So at the moment we could perhaps classify *fundnąć* as a culmination verb, and treat the suffix *-nąć* as a word-forming suffix. As a result of this we would have two co-existing pairs of verbs, namely, a class₃ and a class₅ pair of verbs, sharing the imperfective verb. Perhaps *fundnąć* slightly differs from *zafundować* in that the former is associated with a shorter duration. It is possible that later one of these pairs will be pushed out (similar situations are attested in the history of Polish aspectual pairs). However, it is also possible that at some stage, the imperfective form will become re-interpreted as an unitisable process; as a result of this, the verb *fundnąć* could become one of its perfective siblings.

As we said, the suffix *-nąć* is creatively used by native speakers: both as a word-forming morpheme, and as an aspectual formant. The two functions of *-nąć* are often hard to separate. The suffix *-nąć* is typically used to express that an event had a very short duration, or has culminated. For example, Polish native speakers in Berlin tend to use ‘*-nąć*’ whenever they ‘borrow’ a German verb, which they ‘feel’ to be perfective (that is, it refers to a culmination or a momentaneous event). An example is the German verb *schaffen* ‘to succeed’. This verb is ‘felt’ as referring to a culmination, and in everyday conversation, it is transposed to Polish as the perfective *szafnąć*. Its use is surprisingly wide, perhaps due to the absence of a direct Polish equivalent of the original German verb. Interestingly, an imperfective twin of this verb does not seem to be created; apart from semantical considerations, imperfectivising *szafnąć* is made extra difficult by the phonological structure of this verb.

²Interestingly, all the problematic verbs (except for the state verbs mentioned above) involve the *-nąć*-suffix (or *-na-*) as a word-forming morpheme.

As we said, ‘-nq-’ tends to be used for verbs referring to culmination events, as well as events of short duration. There are some nice examples of this with borrowed English (or German) words concerning computers and the internet. For example, when Polish speakers want to talk (in the progressive) about the action of clicking a mouse they use *klikać* ‘to be clicking’, and for the perfective form they use *kliknąć* ‘to have clicked’. On the other hand, when they use loan words for events of longer duration, the prefix *z(a)-* seems to be the method of choice for expressing completion. (Recall that *z(a)-* is the closest thing Polish has to an ‘all round’ empty prefix.) For example, Polish speakers use the verb *daunlodować* ‘to be downloading’ to express the ongoing action of downloading something from the internet, and *zdaunlodować* to express its completion (other nice example are *resetować* ‘to be resetting’/*zresetować* ‘to have reset’, *formatować* ‘to be formatting’/*sformatować* ‘to have formatted’ (in Polish, *z-* before *f* becomes *s-*) *edytować* ‘to be editing’/*zedytować* ‘to have edited’, and there are many others examples like this). Perhaps such uses of ‘-nq-’ (and ‘*z(a)-*’) give us a glimpse of the future evolution of the Polish aspectual system.

There is another phenomena which should be mentioned here: *prefix doublets*. Normally, if a verb has an empty prefix, only one prefix is empty for that verb. However, there is a small number of verbs which have two empty prefixational possibilities, and these are called prefix doublets. For example, the reflexive verb *malować się* ‘to put makeup on oneself’ is a culminating process verb, and it can take either *u-* or *po-* as an empty prefix. Researchers agree that the prefixal doublets are stylistic or dialectal variants of each other, and they seem to disappear from the language. So for instance, while *pomalować się* ‘to have put makeup on oneself’ seems to be the neutral verb of the doublet, *umalować się* ‘to have put makeup on oneself’ seems to be the stylistically marked one. However, the ‘feeling’ as to which form is marked can in some cases be determined geographically. From the evolutionary perspective, prefixal doublets are a remnant of earlier stages of prefixation in Polish. Until the 15th century Polish had many such competing doublets (indeed, sometimes triplets), but in the intervening centuries most verbs have selected for one of the possibilities, and driven out the other(s). Verbs such as *malować się* are best viewed as the residue of this diachronic process. They don’t challenge the ideas underlying the classification: we simply have to admit that in some cases verbs have two prefixes capable of filling the empty prefix role rather than one.

With this we conclude our discussion of the coverage of the classification. Clearly it would be desirable to carry out further investigations of coverage based on more extensive and more up to date corpora. Nonetheless the fact that the classification covers the majority of the data collected by Czochralski suggests that it will be a useful tool.

5.2 In praise of empty prefixes

We have now presented our Polish verb classification and discussed its coverage. In our view, the classification stands up well as a way of thinking about verb pairing

in Polish. Some readers, however, may feel that the classification can be rejected on purely theoretical grounds. In particular, the classification makes use of empty prefixes, and some readers may find this suspect. For example, in recent years Hana Filip's work on Slavic aspect has been influential among Western linguists, and it is not uncommon to hear it said (by Western researchers, at any rate) that Filip has disproved the existence of empty prefixes. Moreover, readers familiar with the Slavic literature on aspect will realise that the issue of the existence or non-existence of empty prefixes has long been a battleground. So, before exploring the classification further, we should address this issue explicitly.

We begin by examining Filip's discussion of empty prefixes. We then consider the broader literature on empty prefixes.

5.2.1 Filip on empty prefixation

Even a superficial reading of Chapter 4 of Filip's thesis reveals that it contains nothing like a death blow against the concept of empty prefixes. It contains no new arguments against their existence (for the most part, Filip is content to cite the arguments of others), nor does Filip attempt to mount a particularly sustained critique of the concept. And this is not in any way intended as criticism of Filip's work, for the simple fact of the matter is that, from her perspective, empty prefixes are (to use her own words) a "marginal phenomenon" (Filip, 1993, page 292). For Filip is not principally interested in aspect. Her major concern is prefixation, and her main goal is to establish that prefixation is a word formational process.³ From her perspective empty prefixes are a minor irritant, not something to be hunted down and killed. In what follows, we sketch Filip's position, indicating where we agree and disagree. As we shall see, her concerns are largely tangential to ours, and her criticisms of empty prefixes (such as they are) have little or no bearing on our verb classification.

A good place to start is with the following quotation:

There is a clear asymmetry in the relation between perfective and imperfective verbs. If an imperfective verb is a suffixal derivant of a perfective verb (prefixed or simple), the meaning change is regular and predictable. It is restricted to the change in aspect: perfective → imperfective. However if we derive a perfective verb from a simple imperfective verb, the meaning change is often not systematic and predictable. The situation is notoriously complicated in the case of prefixes that derive perfective

³This is something of a simplification. Chapter 4 of her thesis is where her theoretical discussion of empty prefixes is to be found, and it is clear that her real interest in this chapter is with general issues concerning prefixation. However in Chapter 5 of her thesis, she addresses concrete issues in aspect, and in particular how to apply the ideas of Krifka. The puzzling thing is that in Chapter 5 the only examples of aspect she discusses involve pairs of verbs built by empty prefixation: she devotes a lot of attention to the pair *pisat'/napisat'* (that is, the Czech equivalent of *pisac'/napisac'*) and *pit'/vyjit'* (that is, the Czech equivalent of *pic'/wypic'*). That is, although Filip theoretically dismisses them, when she explicitly discusses aspect, most of the examples she discusses involve empty prefixes. In her later work Filip has said less about aspect and has concentrated on prefixation; for instance Filip (2000).

verbs from imperfective verbs. In Czech there are about twenty prefixes that serve to derive perfective verbs from simple imperfective verbs:

1. *do-*. 2. *na-*. 3. *nad-*. 4. *o-*. 5. *ob-*. 6. *od-*. 7. *po-*. 8. *pod-*.
9. *pro-*. 10. *pre-*. 11. *pred-*. 12. *pli-*. 13. *roz-*. 14. *s-(sou-)*. 15. *u-*.
16. *v-*. 17. *vy-*. 18. *vz-*. 19. *z-*. 20. *za-*. (cf. Smilauer 1968; 1971: 165).

There is no single all-purpose neutral prefix that would serve to derive perfective verbs from imperfective ones. While it holds without exception that adding a prefix to a simple imperfective verb yields a perfective verb, apart from this regular change in aspect, other meaning changes that are induced by prefixation are difficult to predict and have so far escaped any truly systematic and revealing description. (Filip, 1993, page 286)

Before going further, a general comment. As we have already discussed, we feel that many writers take an oversimplified view of suffixation (or as we prefer to call it, morphological change). To remind the reader of some of the issues involved here, recall that (as we showed in the previous chapter) suffixation is not a transparent process at all. Sometimes we have just vowel change/insertion, sometimes we have suffix insertion/change, and the process of morphological change is typically accompanied by several changes in accentuation, and vowel/consonant changes within the root. Moreover ‘suffixation’ is connected to the lexicon. The process of morphological change (in particular, the last vowel *a* in the imperfective verb, as well as the additional changes in the root), are traces of lexical encoding of aspect, as (Isačenko, 1962, page 367) argues. Furthermore, the same process of morphological change if applied to different verbs yields iterativity/habituality. For instance, suffixing the imperfective *pisac* ‘to (be) writ(ing)’ by *-yw-* results in *pisywač* ‘to write from time to time/have a habit of writing’; and by vowel change, imperfective *ješć* ‘to (be) eat(ing)’ becomes *jadač* ‘to eat from time to time/have a habit of eating’. Thus we are somewhat skeptical of the neat distinction that Filip attempts to draw here: prefixation and ‘suffixation’ have a lot in common. Still, as this issue has little direct bearing on the issue of the existence or non-existence of empty prefixes, let us put it aside and examine the above quotation in more detail.

The quotation should be read with a knowledge of Filip’s principal research goal in mind, namely to establish that prefixation is fundamentally a word-formational process. Her basic claim is this: when suffixation is used, the sole semantic change is the transition

perfective → imperfective.

That is, in such cases there is simply a flip in the aspectual value from perfective to imperfective. On the other hand, if we apply a prefix to an imperfective verb to form a perfective verb, the meaning change is more complex — in general the semantic shift has the form

imperfective → (perfective + other semantic change).

That is, not only is the aspectual value flipped, but other semantic alterations take place too.

In essence, this difference is why Filip argues against empty prefixes. An empty prefix would be a prefix in which the “other semantic change” in the above equation is reduced to zero. That is, an empty prefix would be a prefix in which the semantic shift induced by the prefix reduced to the form

imperfective → perfective,

which is the mirror image of the effect of a suffixation. The existence of such a prefix would dilute what Filip believes is the sharp distinction between suffixation and prefixation.

Accordingly, Filip’s main argument against empty prefixes is that there are few prefixations where the “other semantic change” is set to zero. According to Filip, prefixation contributes something extra in addition to the aspectual flip:

However, in many cases in which a given prefixed perfective verb and the corresponding simple imperfective verb seem to have the same lexical meaning and differ only in aspect, a fine-grained semantic analysis reveals that the prefix simply reiterates some inherent semantic feature of the verb (cf. Comrie 1976:89, among others). Since the meaning of the prefix and the verb root overlap, the prefix appears to be empty, although it is actually not semantically empty. (Filip, 1993, page 290)

To back up this claim, Filip discusses the effect of prefixing the Czech verb *psat* (to be writing) with the Czech prefix *na* (so her example is the Czech equivalent of the Polish *pisac/napsic*). Now, when earlier discussing the combination of *psat* with different prefixes (see page 288 of her thesis) she explicitly says that apart from prefix *na-* all the other prefixes *clearly* change the lexical meaning of the verb. But the *na-* prefixation is different — it demands (as she says above) “a fine-grained semantic analysis”. This is the analysis she offers:

The imperfective verb *psat*’ is associated with a scene in which a writer guides a pointed trace-making implement or uses some other instrument (type-writer, etc) that leaves a trace on some surface. The prefix *na-* is associated with two dominant senses: (a) locational sense: ‘on’ or directional ‘onto’ and (b) accumulative or measure sense (related to the temporal or spatial domain). One way of interpreting the contribution of the prefix *na-* in the perfective verb *napsat*’ is to think of its having its locational meaning ‘on’ and as overlapping with locational relation between the writing instrument and the flat surface that is present in the frame associated with the corresponding imperfective verb *psat*’. (Filip, 1993, page 290-291)

Some comments. First, the Slavic literature contains many examples of this style of fine-grained semantic analysis. The arguments given are often detailed and ingenious — unfortunately they have been made by both supporters and opponents of

the empty prefixes. For every ingenious argument that an extra semantic component has crept in, you will find another that nothing of the sort has occurred (recall from Chapter 2 Bogusławski's argument that the existence of prepositions closely formally related to prefixes has made some Slavic linguists to see meaning shifts where none in fact exist). Their ingenuity notwithstanding, arguments for or against the existence of empty prefixes based on fine grained semantic analysis strike us as inherently unreliable, and we refused to use them as the basis of our classification. As we emphasized in the previous chapter, our criteria for verb pairing is essentially formal: it is based on the secondary imperfectivisation test (and its mirror image the secondary perfectivisation test). This and this alone is our touchstone for aspectual pairing in general and empty prefixes in particular. Indeed (as we remarked in the previous chapter) it is a matter of indifference to us whether additional semantic change can be detected in the aspectual pairing process or not.

Filip does not overstate the force of her fine grained semantic analysis argument. It is far from obvious that such an argument can be devised for every empty prefix/verb pair, and Filip avoids claiming this. In the quotation given above she merely claims that "in many cases" such a fine-grained semantic argument can be given. By the time she concludes her discussion the 'many' has become a 'most' (she says: "To conclude, prefixation induces aspect shift and in most cases also some change in lexical meaning." (Filip, 1993, page 293)). Nonetheless, nowhere does Filip claim that all prefixes make a non-zero semantic contribution. That is, she seems to concede the possibility that there are semantically empty prefixations — she just doesn't think there are many of them.

However from our point of view this concession is not particularly interesting. We make no appeal to a distinction between prefixes that are 'semantically empty' versus those that are not — our work is based on the secondary imperfectivisation test. So how does Filip view the secondary imperfectivisation test?

However, this is a rather weak argument for the existence of 'empty' prefixes. Since there are only a few prefixed verbs that have no secondary imperfective counterparts, such a delimitation of 'empty' prefixes would drastically reduce their number so that their existence would be a marginal phenomenon. (Filip, 1993, page 292)

What does this mean? As we read it, Filip concedes that using the test as a criterion is unobjectionable — but then it as a threat to her position because it would reduce empty prefixation to a "marginal phenomenon".

We agree with her assessment. From Filip's perspective (that is, from the perspective of a researcher interested primarily in establishing that the primary role of prefixation is word formational) this conclusion is unobjectionable: empty prefixation *is* a marginal phenomenon. After all, the vast majority of prefixations in Polish are obviously word-formational. Moreover there is no unique neutral 'empty prefix' (as there is in, say, Lithuanian) which survives the secondary imperfectivisation test in combination with most verbs. Rather, the 'empty prefix' in Polish is elusive, changing its identity from verb to verb. It is unsurprising that Filip calls empty prefixation a

marginal phenomenon and (given her perspective) we agree that she has every right to do so.

But this thesis is not about prefixisation — it is about aspectual pairing. And from an aspectual perspective empty prefixes are not marginal at all: they are special. From our perspective, the vast majority of prefixisation are as dull as ditchwater — they are obviously word formational, and are of no interest whatsoever aspectually. But hidden among the rock and sand is aspectual treasures. How do we isolate the gold? The secondary perfectivisation test washes away the rubble to reveal the empty prefixations, the prefixations that are aspectually important.

In short, as far as we can see there is no disagreement between the work of this thesis and Filip's view of the secondary imperfectivisation test. The most that can be said is that what she finds marginal, we find special, and vice-versa. But this does not reflect any deep differences in our attitude towards the secondary imperfectivisation test, it is merely that we are interested in different issues.

Of course, Filip's views mean that she is led in directions that go against the grain of the present thesis. For example, Filip's views seem to lead her towards a somewhat negative assessment of the importance of Slavic languages for aspectual studies:

The lexical derivational character of the Slavic perfective and imperfective categories, among others, leads Dahl (1984 and 1985:84) to the conclusion that the Slavic aspectual systems are idiosyncratic in many respects, and it cast doubt on the long cherished assumption that the Slavic aspectual systems are to be taken as prototypical exemplars of aspectual systems. (Filip, 1993, page 294-295)

From a diachronic perspective, we tend to agree with this. As we saw in Chapter 1, and as we shall argue later in this chapter, the Polish aspectual system evolved to fill a need, and to this end cheerfully hijacked a mixed bag of tools, including prefixisation and morphological change. But from a synchronic perspective we disagree. The aspectual system that resulted from this complex evolutionary process (the system embodied in the classification) strikes us as extremely elegant. In our view the “long cherished assumption” that Slavic languages have a lot to teach us about aspect is well founded, at least if the word-formational perspective of the present thesis is adopted.

5.2.2 Other writers on empty prefixation

As should be clear from our historical survey in Chapter 2 of the development of ideas of aspect and Aktionsart, the view that only suffixation is a means of forming aspectual pairs, and that empty prefixes are not genuinely aspectual, has a long history in the Slavic literature. Indeed, the whole issue of the existence or non-existence of empty prefixes has been debated there for decades.

An important researcher who argued for the ‘suffixation only’ view of aspectual pairs was Karčevski (1927). His view was picked up by the two most influential Russian aspectual scholars: Maslov and Isačenko, so it is important to understand

Karčevsky's argument. In Karčevsky's opinion, aspect functions as an opposition between two ways of viewing of a process. Perfective aspect abstracts from the duration of a process and reduces it to the point of its result, and imperfective aspect views a resultative process in its duration. According to Karčevsky, these two operations, although semantic in nature, are grammatical, since they do not change the conjugational class of the basic verb (Karčevski, 1927, page 96). The fact that Karčevsky recognizes the semantic nature of aspect, and that he explains it in terms of the notion of result, leads him to the conclusion that aspect is related to the notion of tense, transitivity, voice, and mood — since the notion of result underlies these categories as well (Karčevski, 1927, page 95f.). Karčevsky recognizes that aspect is also realized within the system of verbal derivation — that is, outside of the conjugational system. Within the system of verbal derivation, aspect can be expressed by prefixation, or suffixation by the suffix *-nu-* (the Russian equivalent of the Polish semelfactive suffix *-ną-*); but in Karčevsky's opinion, these derivational formants modify the semantics of the basic verb.⁴ Pairs of verbs established by the derivational operations do not form aspectual pairs. An aspectual pair is a pair of verbs that do not differ in their semantics. An aspectual pair exists as a grammatical pair, and is established by suffixation by *-yv-*.

Les seuls couples aspectifs ayant une existence réelle dans la langue sont les couples grammaticaux (*vyigrat'*-pf./*vyigryvat'*-impf.) correspondent à l'opération du développement dans le temps d'un procès perfectivé, opération, comme nous le savons déjà, de caractère entièrement grammatical. (Karčevski, 1927, page 107)

To be more precise, aspectual pairs are pairs of verbs consisting of prefixed perfective verbs and their secondary imperfectivised counterparts, as well as basic perfective verbs and their (primarily) imperfectivized equivalents. (Karčevsky remarks that there are a few suppletive pairs (“les couples lexicologiques”), but they are extremely rare, and are not instances of aspectual pairs.) The main reason why prefixal pairs are in Karčevsky's view not aspectual pairs is that the majority of the prefixed perfective verbs can be again imperfectivised. Interestingly, Karčevsky admits that there are prefixed verbs which cannot be secondarily imperfectivised, and he proposes that these verbs express a modification of the process (that is, they emphasise the final stage of the action), and they come close to be regarded as perfective counterparts of the basic verb; an example of such a verb is *napisat'*.

Karčevsky's 'suffixation only' view was picked up by Maslov (Maslov, 1959, page 176), and followed by Isačenko (Isačenko, 1962, page 350ff.). As observed earlier, Maslov and Isačenko were perhaps the most influential writers on Russian aspect, and it is probably fair to say that their view is the received view in the Slavic tradition. Like Karčevsky, Maslov and (following him) Isačenko, as well as (following Isačenko) the Polish scholar Czochralski, argue that only suffixal pairs are instances of 'pure' aspectual pairs. However, in contrast to Karčevsky, Maslov and Isačenko do

⁴Incidentally, Karčevski (1927) does not use the term 'Aktionsart'; his bibliography does not include Agrell (1908).

not particularly accentuate the notion of result as underlying the category of aspect. On the contrary, when arguing in favour of a separation between suffixal and prefixal pairs, they describe the meaning of result as the semantic contribution of the empty prefix, and present it as the feature distinguishing prefixal and suffixal pairs of verbs. They argue that pairs of verbs established by means of prefixation by empty prefixes are instances of derivation of “resultative Aktionsart”, since, as they argue, the empty prefixes contribute a shade of meaning of an achieved result. That is, they argue that while the prefixed perfective verb differs from the basic verb in that it additionally expresses that the result was reached, a suffixal pair of verbs is semantically completely synonymous (Isačenko, 1962, page 361).

Let us consider Isačenko’s argument in more detail. His view seems quite complicated. On the one hand, Isačenko argues that since prefixation is clearly a derivational process, it cannot be viewed as on a par with the purely grammatical process of suffixation. As he puts it, as a result of treating prefixation as a means of aspectual pair formation, aspectual pairs would not be treated as part of the Russian grammar — and Russian grammar without a means of expressing verbal aspect is unimaginable (Isačenko, 1962, page 350-351). However (as we discussed in Chapter 2) Isačenko recognizes the intransparency of the process of ‘suffixation’. And, perhaps for this reason, he argues that formal criteria are in a sense irrelevant to determining what true aspectual pairs really are, and that what is really decisive when interpreting ‘linguistic facts’ is the meaning: “*Ausschlaggebend* für diese und jene Auslegung sprachlicher Tatsachen ist *immer* die Bedeutung” (Isačenko, 1962, page 351).

Nowhere however does Isačenko state how the meaning of an aspectual pair should be established — indeed, when discussing the issue of empty prefixes as a means of aspectual pair formation, Isačenko repetitively emphasizes the absence of ‘objective criteria’ for determining what a true aspectual pair really is. Hence it seems that the only ‘objective criteria’ that Isačenko uses are his intuitions about the real meaning of true aspectual pairs. But this is a difficult issue, since Isačenko does not seem to believe that native speaker intuitions are helpful in establishing what ‘true’ aspectual pairs are. Indeed, native speaker intuitions support many things that Isačenko dislikes: for example, they consider prefixal pairs as true aspectual pairs — and more than that, they even support viewing more than one prefixed verb as a perfective twin of the basic imperfective verb (such as *pisat’/napisat’* and *pisat’/popisat’*). Such views are, according to Isačenko, common in what he calls ‘traditional’ grammars (for instance, the prominent Academy Grammar), textbooks on the Russian language, as well as in dictionaries — all of them written by Russian native speakers. Isačenko explains this as a consequence of the absence of objective criteria for establishing what true aspectual pairs really are (Isačenko, 1962, page 360-361). However, as he himself supplies no ‘objective’ criteria, this does not help much.

Isačenko bases his argument against treating empty prefixes as aspectual pair forming on his observation (or, indeed, native speaker intuition) that these prefixes express a ‘resultative’ shade of meaning. His argumentation is directed against calling any prefixes ‘empty’ (or ‘grammatical’), as is done in traditional grammars. He

discusses the traditional distinction between empty/grammatical prefixes (which are used for aspectual purposes) and lexical prefixes (which are used for word-formational purposes). Since, as he argues, the empty prefixes contribute the meaning shade of the achieved result, they are not really empty. He proposes to replace the traditional distinction by a distinction between ‘qualifying prefixes’ (“qualifizierende Präfixe”), which completely change the meaning of the verb to which they apply, and ‘modifying prefixes’ (“modifizierende Präfixe”) which do not completely change the meaning of the verb to which they apply, but only modify it by adding a meaning shade. Isačenko admits that pairs of verbs related by the empty prefixation relation are very closely related, and there exists almost no semantic difference between them — but as he puts it, it is this “almost” that needs to be emphasized. The “almost” relates namely to the meaning of an “achieved result of an action”, which is the distinctive feature of a prefixal pair. In Isačenko’s opinion, the meaning shade brought about by an empty prefix cannot be equated with the ‘grammatical meaning of perfectivity’ (Isačenko, 1962, page 362). As the reader can see, concerning the meaning of a true aspectual pair, Isačenko seems to differ from Karčevsky who recognizes that perfective aspect contributes the meaning of an achieved result to the action described by the imperfective verb.

Isačenko’s position is a hard one to defend. To mention just one difficulty, it is somewhat paradoxical that formally different prefixes, each derived from different preposition, contribute *exactly* the same minimal meaning change: namely some achieved result meaning. Actually, the situation is even more complex than that. As our classification makes explicit, exactly the same prefixes that are described by Isačenko as expressing that an eventuality has achieved its result, can, when applied to other sort of verbs, make explicit a reference to the beginning of an eventuality.

Summing up, Isačenko’s decision about what a true aspectual pair really is, is based on his theoretical assumption of a fundamental difference between prefixation and suffixation, as well as on his intuitions about the actual meaning of a true aspectual pair. However, at the same time, Isačenko makes an illuminating remark about how the assumed semantic definition of aspect determines whether a verbal pair is called an aspectual or an Aktionsart pair.

Die Kriterien für die Aufstellung von Aspektpaaren sind bis heute nicht völlig geklärt (L.A.Bykova, 1958, 114). Diejenigen Forscher, welche die grammatische Bedeutung des perfektiven Aspektes mit der “Vollendetheit”, “Abgeschlossenheit”, dem Begriff der “inneren Grenze” (vnutrennyj predel) oder mit dem Begriff des “erreichten Resultats” gleichsetzen, kommen naturgemäß zu wesentlich anderen Ergebnissen, als jene, für die die grammatische Bedeutung des perfektiven Aspektes dem Ausdruck eines “einheitlichen, zusammengefaßten Geschehens” gleichkommt, der “geschlossen im Blickfeld des Sprechers liegt” und “gleichsam von außen in einer perspektivischen Sicht in seiner Gesamtheit übersehen wird”(R. Ružicka, 1952, 4, 165). (Isačenko, 1962, page 360)

Since Isačenko rejects pairs of verbs based on empty prefixation as instances of

pure aspectual pairs, he also rejects the view that Russian verbs come in pairs.

Die durch das sprachliche Material nicht belegbare These von der grundsätzlichen Paarigkeit der russischen Verben ist also fallen zu lassen. (Isačenko, 1962, page 360)

However, as the reader might recall, the reason why he first refused to treat prefixation as a means of forming aspectual pairs, was his fear that because of this aspectual pairing would not be part of the Russian grammar — a consequence, in his view, unbearable.

Für jene Forscher, die sich scheuen, die beiden Aspektglieder als Formen eines Verbs anzusehen, bleibt das Aspektproblem eine Angelegenheit der Wortbildung, also eine wesentlich lexikalische Frage, die dann natürlich in der Grammatik, wie wir sie auffassen, kaum etwas zu suchen hat. Man kann sich aber wohl schwer eine Russische Grammatik vorstellen, in der der Verbalaspekt nicht zur Sprache käme. (Isačenko, 1962, page 350-351)

As we said earlier, we think Isačenko's position is rather hard to defend. Ironically, many Western linguists refer to Isačenko as a 'traditional' writer on Slavic aspect. As we have just seen, the reality is that Isačenko is keen to reject the views of traditional grammarians and dictionaries. While his views may nowadays be the received view in Slavic aspectology, the fact remains that they are startlingly different from traditional views. Readers familiar only with Isačenko-style 'suffixation only' approaches may find our classification radical. In fact, it is far closer to traditional views than to Isačenko's is.

Let us now examine Czochralski's position on empty prefixation as an aspectual pair forming mechanism. Theoretically, Czochralski follows Isačenko (Karčevsky and Maslov) in their 'suffixation only' view on aspectual pairing, however in practice his position is more nuanced. The nuance seems to be brought into his theory by his meticulous examination of an extensive corpus of Polish verbs — a task that neither Isačenko nor Maslov undertook for Russian.

Czochralski starts by showing that a 'true' aspectual opposition, as realized by the imperfectivisation of a perfective verb, is based on the 'pre-resultative/resultative' distinction — that is, on the same semantic distinction that underlies a resultative Aktionsart pair (built by empty prefixation). In a sense, Czochralski thus seems to come back to and develop Karčevsky's observation that such verbs as *napisać* 'to write-perf', which emphasise the meaning of reaching the result of the process referred to by the basic verb *pisać* 'to write-impf' actually come close to functioning as perfective equivalents of the basic verbs from which they are derived.⁵ Moreover, Czochralski actually explicitly argues that resultative Aktionsart verbs (as well as some other verbal pairs, which theoretically are not aspectual pairs) do function as true aspectual pairs in the process of communication. Why? Because his corpora-based work makes him see clearly that the 'suffixation only' view on aspectual pairs

⁵This observation seems to be made independently, since Czochralski does not refer to Karčevsky.

is untenable if one wants to account for the empirical data — and in particular, if one wants to take into account the way the Polish language is used by its native speakers. As Czochralski clearly sees, without a full system of aspectual pairs, Polish verbal system could not function properly. Czochralski argues that in order to fill in the aspectual gaps, derivational or lexical means (that is, empty prefixes) are employed to derive the so-called ‘secondary aspectual pairs’ (Czochralski, 1975, page 30-49).

Zuerst aber muß in knapper Form folgendes ausdrücklich gesagt werden: Im Laufe einer minutiösen Analyse des Korpus habe ich das Wirken von drei wichtigen Prozessen innerhalb des Aspektsystems festgestellt. In ihnen allen macht sich die Tendenz zur Wiederherstellung der aspektuellen Symmetrie geltend. Also — im Falle von Leerstellen im Aspektsystem liegen drei Möglichkeiten der Ausfüllung vor: a) durch Extension, b) durch Aspektbildung. c) durch Transposition. (Czochralski, 1975, page 37)

Czochralski is a particularly interesting writer from the perspective of this thesis — and not merely because of his valuable corpora-based work. While Czochralski seems to have held a ‘suffixation only’ view, his ‘field-work’ forced him to admit that Polish verbs occur in aspectual pairs. There are many apparent differences between the views Czochralski officially expresses, and the ideas developed in this thesis — nonetheless hiding behind such terminology as ‘secondary aspectual pairs’ developed to ‘fill the communication needs’ lies a view point that (we feel) is actually surprisingly close to the one developed in this thesis.

But the views that suffixation is not fundamentally different from prefixation by empty prefixes, has also been stoutly defended in the literature. An early contribution defending this view is Koschmieder (1934). His view was strongly criticised by Maslov (Maslov, 1959, page 177). Another notable defense of prefixation as aspectual forming is the work of Bogusławski (1960, 1963) who argues that there is no real semantic difference between pairs built by suffixation and those built by empty prefixes. Bogusławski correctly observes that the ‘minimal’ degree of meaning change that Maslov (and Isačenko) talk about is unspecified, and argues that the misunderstanding as to the ‘lexical’ meaning of an empty prefix can be caused by the *association* with the meaning of the corresponding preposition, and not by the empty prefix itself (Bogusławski, 1963, page 99). But although Bogusławski’s conclusion that empty prefixes exist agrees with the approach taken in this thesis, his route to this conclusion is very different from ours. His arguments are based on a fine-grained semantic analysis of verb meaning, and not on the secondary imperfectivization test, which he indeed rejects.

Let us close this section with some speculations. There seems to be a general tendency for morphologically-oriented scholars working on Russian to reject empty prefixation as a means of aspectual pair formation. This follows from their theoretical assumptions concerning a fundamental difference between prefixation as a derivational process and suffixation as an inflectional process. This position is often

supported by pointing to cases in which prefixed perfective verbs can be secondarily imperfectivised. On the other hand, scholars working on Polish seem to be more flexible in their views on empty prefixation and less strict in distinguishing between prefixation and suffixation as aspectual pair forming mechanisms. Even such a conservative aspectual researcher as Czochralski, who moreover explicitly intended to follow the aspectual theory of Isačenko, does recognize that prefixal pairs, although in theory not true aspectual pairs, function in practice as true aspectual pairs. Moreover, it also seems that Czochralski assumes the correctness and reliability of the logic underlying the secondary imperfectivisation test.⁶

It could well be that this kind of disagreement has been influenced by differences in empirical data. Languages change over time, and Slavic languages differ from each other. The empirical data on which aspectologists at the beginning of the twentieth century based their theories, is *not* completely identical with contemporary data. Moreover, Russian data are different from Polish data. But if one follows the lines of argument in the work of particular researchers, it does not seem that these two factors have been taken sufficiently into account. Recall that the received view in contemporary Slavic aspectology is strongly influenced by Russian scholars such as Maslov or Isačenko — and they picked up the line of argument represented by Karčevsky. However, in the decades separating Karčevsky from Maslov or Isačenko, the Russian language has almost certainly changed. And it would be highly misguided to assume that the Russian data of the 1920s is a reliable guide to contemporary Polish. As we said in Chapter 1, in the first half of the twentieth century, a stabilisation of Polish prefixation took place, in the sense that particular prefixes started to specialize themselves as perfectivising formants of particular verbs. Moreover, the striving to uniformity of imperfectivisation by suffixation (that could be clearly attested through the period of Middle and New Polish) probably continued through the twentieth century. As we noted above, Czochralski argues that the Polish of the 1970s, the system of aspectual pairs is “defekt” and characterized by a strong striving to filling in the aspectual gaps. If we ignore the negative connotation of the word ‘defekt’ (and replace by our own favorite word ‘hijacking’), it seems that (once again) there is substantial agreement between Czochralski’s position and that of this thesis: we don’t believe that the views of Maslov or Isačenko apply to contemporary Polish any more than Czochralski seems to have believed deep down that they could be made to work for the Polish of the 1970s.

It is impossible to survey here all this literature in detail, but the main message should be clear: we doubt that reader will find any off-the-shelf arguments against our use of empty prefixes. For us, ‘empty prefix’ is a technical term with a precise definition: it is a prefix which passes (our version of) the secondary imperfectivisation test. Moreover, even our approach to the ‘suffixes’ that most researchers regard as unproblematic is based on an analogous criterion, namely passing the secondary perfectivisation test. That is, in our approach to verb classification we have tried to bypass the difficulties which arise when subtle semantic distinctions are discussed, and

⁶A rather special position is represented by Bogusławski (1963) who, working on Russian, rejects the secondary imperfectivisation test as a reliable criterion for establishing aspectual pairs, but (being Polish) also rejects the view that there is any semantic difference between the two sorts of aspectual pairs!

to focus on what we regard as the key issue: verb pairing. We based our approach on the secondary imperfectivisation and perfectivisation precisely because passing these tests seems the most natural way of explaining what it means for verbs to occur in a pair — a criterion that does not rest on fine grained semantic judgments.

5.3 Formal semantics

In the previous chapter we showed that our Polish verb classification induced important semantic distinctions. However our discussion of these distinctions was informal. In the present section we will show that the main ideas can be formalized.

Informal semantic discussion, because it can make free use of all the resources of natural language, tends to be nuanced, rich, and suggestive. Its disadvantage is that this very richness may obscure simple patterns and generalizations, and may make it difficult to discern fundamental distinctions. By working in a mathematical setting we can hope to bring hidden regularities to light, and to obtain a clearer idea of which distinctions are important. These are the principle motivations guiding the work of this section.

We proceed as follows. We will develop a simple modal-style semantics for Polish verbs. By ‘simple’ we mean that we are trying to give an analysis of the semantic distinctions the classification gives rise to that is as straightforward as we can make it. In particular, we want to show that only relatively straightforward set-theoretic definitions of how eventualities can be patterned through time are needed to account for the semantic distinctions observed in the previous chapter. By ‘modal-style semantics’ we mean that we are going to employ the technical idea that (since the pioneering work of Kripke) is probably the central idea of modern modal logic, namely the idea of evaluating expressions inside models at particular states. Modern modal logic revolves around the idea of defining the following relation:

$$\mathbf{M}, t \models \textit{expression}.$$

This is the standard modal notation used to indicate that *expression* holds at state *t* in model *M*. Now, the expressions we are interested in are simply the verbs covered by our classification — but what will the models be? Our first task will be to define these. As we shall see, the models we define can be thought of in temporal terms: in essence we will have a ‘flow of time’, decorated with eventualities. The states in our models will be points of time. Once we have defined our models, we will interpret the verbs. That is, we shall define when the various kinds of verb in our classification hold at a time *t* in a model *M*.

A terminological remark. Because we are going to think of the states in our models as times, we are working in the kind of modal logic that is often called ‘tense logic’; Prior (1967, 2003). However, the word ‘tense’ is confusing in this setting (after all, our topic is aspect) so we’ll largely avoid all talk of ‘tense logic’ in what follows and simply speak of ‘modal logic’.⁷

⁷A final remark for readers unacquainted with contemporary modal logic. Such readers may find it

5.3.1 The models

We begin by defining the models we will be working with. A model \mathbf{M} is a tuple

$$\langle R, <, E \rangle,$$

where R is the set of real numbers, $<$ is the usual ordering of the real numbers, and E is a set of *eventualities*. Intuitively, the elements of R are here being viewed as points of time, and the $<$ relation is being viewed as the earlier-than/later-than relation that holds between these time points. The third component, the set of eventualities E , ‘dresses’ this bare time line with some specification of when various things are happening, or when various properties hold.

It is worth emphasizing that nothing much depends on working with $\langle R, < \rangle$ as the ‘bare’ time line; we have chosen it largely because it is a mathematically well understood structure that can play the role of time line reasonably well (it plays this role in classical physics, for example). But it would be straightforward to work with models based on other time lines (for example, the rational numbers in their usual order), or even on tree-like or branching structures, and if we were attempting to deal with a wider range of semantic phenomena it might well be necessary to consider such options. But the focus of this investigation is the semantics of Polish aspectual pairs in isolation from other phenomena. And as the reader will soon see, it is not the underlying flow of time which is crucial for this, rather it is the structure of the eventualities and the structural distinctions between the various types of eventualities, that plays the key semantical role.

So let us now say what eventualities are. We shall define five types of eventuality, one for each of our five aspectually basic classes of verb. First some preliminary remarks on notation and terminology.

Eventualities will be tuples of the form

$$\langle \textit{type}, \textit{temporal profile} \rangle,$$

or

$$\langle \textit{type}, \textit{temporal profile}, \textit{culmination} \rangle.$$

It is a little strange that a verb is written to the right hand side of the \models symbol; in traditional applications of modal logic, such as reasoning about necessity and possibility, the symbol to the right hand side is usually regarded as a proposition and the \models relation is usually regarded as truth. However nowadays modal logicians tend to view the \models relation as expressing that some sort of ‘fitness’, or ‘suitability’ holds between the logical expression on the right of \models and the semantic entity (some kind of model) on its left. What exactly is meant by ‘fitness’ or ‘suitability’ depends on the area in which we are working. To give an example from what is known as description logic (a form of modal logic widely used in AI) in such applications one finds such expressions as

$$\mathbf{M}, \textit{john} \models \textit{happy}.$$

That is, in this example the natural reading of \models is ‘realises the property’ so we could read the above expression as ‘in model \mathbf{M} at john the property of being happy is realized’. In essence, the \models symbol gives rise to a hidden predication, and in fact the notion of hidden predication lies at the heart of modal *correspondence theory*, which shows how to systematically link modal and classical logic (for a detailed discussion of this perspective see Chapter 2 of Blackburn et al. (2001)).

The first component of such tuples, *type*, simply tells us the type of an eventuality. What types are possible? There will be exactly as many verb types as there are verbs in

$$\text{Class}_1 \cup \text{Class}_2 \cup \text{Class}_3 \cup \text{Class}_4 \cup \text{Class}_5.$$

(Here Class_1 is the set of all Polish class_1 verbs, Class_2 is the set of all Polish class_2 verbs, and so on.) That is, each aspectually basic verb picks out a type of eventuality, thus there are *gotowac* (cooking) eventualities, *czytac* (reading) eventualities, *grubnac* (growing fat) eventualities, and *pic* (drinking) eventualities, and so on.

The heart of our semantics lies in the second and third components, that is, the temporal profiles of the different verb classes, and (for those verbs for which the concept makes sense) their culminations. Temporal profiles and culminations are constructed set-theoretically out of the real numbers under their usual ordering. First some (standard) notation and terminology:

- For all $a, b \in R$, the closed interval $[a, b]$ is $\{c \in R | a \leq c \leq b\}$.
- For all $a, b \in R$, the right-open interval $[a, b)$ is $\{c \in R | a \leq c < b\}$.
- For all $a, b \in R$, the open interval (a, b) is $\{c \in R | a < c < b\}$.

We use the standard notation \emptyset to denote the empty set.

With these preliminaries out of the way, we are ready to define the eventualities we shall need.

Class₁ eventualities A class_1 eventuality is a tuple of the form

$$\langle \text{type}, [a, b] \rangle,$$

where $\text{type} \in \text{Class}_1$, and $[a, b]$ is a closed set of real numbers. We sometimes call class_1 eventualities *state or gradual transitions tuples*. We define the *realisation duration* of such a tuple to be $[a, b]$, we define the *inception* of such a tuple to be a , and we define the *conclusion* to be b . Intuitively, the realisation duration for a gradual transition is the period over which it happens (and the realisation duration for a state is the period over which it holds), the inception marks the start of this happening (or holding), and the conclusion marks its cessation.

For example, the tuple

$$\langle \text{wierzyc}, [2, 3] \rangle$$

is a “believing eventuality” with realisation duration $[2, 3]$, inception 2, and conclusion 3. That is, this tuple models some believing which started to hold at time 2, held over the interval $[2, 3]$, and ceased to hold at time 3. Similarly, the tuple

$$\langle \text{grubnac}, [2, 7] \rangle$$

is a “growing fat eventuality” with realisation duration $[2, 7]$, inception 2, and conclusion 7. That is, this models some growing fat episode which started to happen at time 2, happened over the interval $[2, 7]$, and ceased to happen at time 7.

Two remarks should be made. First, calling Class_1 eventualities “states or gradual transitions tuples” is a deliberately clumsy choice of name: it is intended to act as a reminder that class_1 verbs fall into two semantically distinct types, namely states and gradual transitions. As we argued in the previous chapter, the Polish aspectual distinction does *not* distinguish between states and gradual transitions, hence we make no attempt to distinguish them in our models. Rather, the two subtypes of verb will be interpreted on such tuples in different ways, as we shall see when we turn to the issue of interpretation.

Second, some readers may wonder why we have used the closed interval $[a, b]$ as the temporal profile. Some writers on temporal semantics (for example van Benthem (van Benthem, 1983, page 196)) have suggested that states have fuzzier endpoints than (say) processes, and urge that states be modeled using open intervals (a, b) , and this view also seems plausible for gradual transitions. So why haven’t we followed this course here?

There would be no harm in doing so — it wouldn’t effect the work that follows. We avoid it simply because it doesn’t really add anything either. We have tried to define models with the minimal temporal structure required to draw the distinctions made by the Polish aspectual system. Using the temporal profile (a, b) rather than $[a, b]$ introduces a distinction which doesn’t do any real work at this level of analysis.

Class₂ eventualities A class_2 eventuality is tuple of the form

$$\langle \textit{type}, [a, b] \rangle$$

where $\textit{type} \in \text{Class}_2$, and $[a, b]$ is a closed set of real numbers. We sometimes call class_2 eventualities *process tuples*. We define the *realisation duration* of such a tuple to be $[a, b]$, we define the *inception* of such a tuple to be a , and we define the *conclusion* to be b . Intuitively, the realisation duration for a process is the period over which it takes place, the inception marks the start of the process, and the conclusion marks its cessation.

For example, the tuple

$$\langle \textit{siedziec}, [-1, 4] \rangle$$

is a “sitting eventuality” with realisation duration $[-1, 4]$, inception -1 , and conclusion 4 . That is, this models some act of sitting which started to happen at time -1 , held over the interval $[-1, 4]$, and ceased to hold at time 4 .

Note that from a set-theoretic perspective, process tuples differ from state or gradual transition tuples only in the types that they allow. For the purposes of the present investigation, we believe that is the way it should be. It would be easy to distinguish processes from states/gradual transitions by adding additional structure to our models (perhaps by assigning open temporal profiles (a, b) to states/gradual transitions and reserving closed intervals $[a, b]$ for process). But, for present purposes, such ‘distinctions’ strike us as essentially decorative. To repeat what was said above, our strategy is to introduce only the structure actually required to draw the distinctions made by the Polish aspectual system, and the debate on open versus closed intervals does not seem to bear on this in interesting ways.

Class₃ eventualities We distinguish two kinds of class₃ eventualities. The first are tuples of the form

$$\langle type, [a, b), \{b\} \rangle$$

where $type \in \text{Class}_3$, and $[a, b)$ is an right-open set of real numbers. We often call tuples of this form *culminated culminating process tuples* (or more simply: *culminated cps*). The second of class₃ eventualities are tuples of the form

$$\langle type, [a, b), \emptyset \rangle.$$

We often call tuples of this form *non-culminated culminating process tuples* (or more simply: *non-culminated cps*) (the terminology “culminating process” is taken from Moens and Steedman (1987, 1988)). We define the *realisation duration* of both types of tuple to be $[a, b)$, we define the *inception* of both types of tuple to be a , and we define the *conclusion* of both types of tuple to be b .

What is the basis for this distinction? Recall that the paradigmatic examples of culminating processes are such activities as crossing a road, or reading a book. That is, there is some sort of preparatory process (actually starting to walk across the road; or reading Chapter 1, and then reading Chapter 2, and so on) followed by a culmination (the completion of the crossing, or the moment when the satisfied reader lays the book aside and says “Wow, J.K. Rowling is a great writer!”). Culminated cps are intended to model such ‘complete’ or ‘uninterrupted’ culminating processes. In particular, the right-open interval $[a, b)$ marks the period over which the preparatory process runs, and the third component contains the culmination point, namely point b .

But life isn’t always so straightforward. Jan was happily crossing the street clutching an open bottle of vodka, and failed to observe the truck bearing down on him; tragically he never made it to the other side. Piotr made valiant efforts to get through Volume 5 of Harry Potter, but found its length intimidating and eventually gave up. The type of activity Jan and Piotr were engaged in (crossing and reading) are class₃ eventuality types, that is culminating process types. But both were interrupted — in neither case was a culmination achieved. We need to have set-theoretic entities in our models that can play the role of such interrupted culminating processes, and that is the function of non-culminated culminating process tuples. In such tuples, the third component contains no culmination point: it is empty. That is, we are being explicitly told that we are working with an eventuality of culminating process type in which the culmination point was *not* achieved. Thus we have an explicit set-theoretic distinction in our models which tells us whether a cp type eventuality is culminated or non-culminated, and as we shall see when we discuss interpretation, this distinction will be exploited by the aspectual formants.⁸

Let’s consider some examples. First consider the tuple

$$\langle pisac, [10, 15), \{15\} \rangle.$$

⁸The distinction between culminated and non-culminated cps can be viewed as a modal-theoretic way of getting a grip on the Moens and Steedman (1987, 1988) notion of ‘stripping’ a culmination from a culminating process. In particular, the use of \emptyset in non-culminated cps can be viewed as a set theoretic marker that the culmination has been stripped.

This is a reading eventuality, which started at time 10, and finished at time 15. We know that this eventuality is a culminating process (because the type, *pisac* comes from class₃) and moreover we know that the culmination was achieved (for the culmination component contains a point, namely 15). But now consider the tuple

$$\langle \textit{pisac}, [10, 13], \emptyset \rangle.$$

This is also a reading eventuality. It started at time 10, and finished at time 13. We know that this eventuality is a culminating process (because the type, *pisac* comes from class₃) but we also know that the culmination was *not* achieved, for the culmination component is empty.

An important point needs to be stressed. Both types of culminating process have a realisation duration which is, intuitively, the interval over which the eventuality runs. Moreover, both types of the events have conclusions. It is vital to appreciate that the concluding point *b* represents very different kinds of ‘finishings’ in the two types of structure. For a culminated culminating process the conclusion is the time at which the culmination point is reached. That is, the time at which the ‘typical’ culmination happens (for example, the moment when the satisfied reader throws the book aside and says “Wow, J.K. Rowling is a wonderful writer!”). On the other hand, for a non-culminated culminating process the point *b* merely marks where the activity stopped. No culmination point was achieved (for example, it might simply be the time when Jan, halfway through volume 5 of “Harry Potter” and bored by its length, lay it carelessly aside never to return to it). To sum up: both types of culminating processes have realisation durations and both have conclusions, but they encode precisely the distinction between ‘typical’ culminations and ‘atypical’ endings. As the reader has probably already guessed, the first type of endings are those that will be used by empty prefixes, and the second are those that will be used by the delimitative *po-*.

Another comment is in order. Note that both kinds of culminating process tuples are essentially temporal entities — both are constructed set theoretically out of real numbers (which we are using as our model for the flow of time) and when we consider the matter of interpretation we shall see that these simple temporal entities are all that is required to account for the basic semantics of class₃ verbs. That is, unlike parallelism based approaches, we don’t need to make any particular assumptions at this stage concerning the denotations of noun phrases in order to get started on the business of interpreting aspectual distinctions.

Class₄ eventualities A class₄ eventuality is a tuple of the form

$$\langle \textit{type}, \langle [a_1, b_1], \dots, [a_n, b_n] \rangle \rangle$$

where *type* \in Class₄, and $\langle [a_1, b_1], \dots, [a_n, b_n] \rangle$ is a finite, non-empty sequence of closed sets of real numbers such that $b_i \leq a_{i+1}$ (for all i such that $0 \leq i < n$).

We call an arbitrary tuple of this form an *arbitrary unitisable process tuple* (or more simply: an *arbitrary up*). If a unitisable process has the form

$$\langle \textit{type}, \langle [a, b] \rangle \rangle$$

(that is, if the sequence contains only one closed interval) then we call it a *minimal unitisable process tuple* or more simply: a *minimal up*). Any unitisable process that is not minimal (that is, any unitisable process containing a sequence of closed intervals of length at least two) is called a *non-minimal unitisable process tuple* (or more simply: a *non-minimal up*).

What is the intuition behind these structures? An example should make matters clear. Consider the following unitisable process tuple:

$$\langle \text{pukac}, \langle [1, 1.65], [2, 2.65], [3, 3.65], [4, 4.65] \rangle \rangle.$$

This is a knocking eventuality (the type *pukac* tells us that) that is made up of four separate knocks (one starting at time 1 and finishing at time 1.65, the next starting at time 2 and finishing at time 2.65, the next starting at time 3 and finishing at time 3.65, and the final one starting at time 4 and finishing at time 4.65). That is, we have an eventuality with four natural subparts (the four times when someone's knuckle is actually in contact with the door, thus making the knocking sound). On the other hand, consider the tuple

$$\langle \text{pukac}, \langle [7, 7.65] \rangle \rangle.$$

This is also a knocking eventuality (the type *pukac* tells us that) but it has only one natural subpart: it consists of only one single knock which starts at time 7 and finishes at time 7.65. This is a *minimal* knocking event — after all, it is hard to see how an event can contain less than one actual knock and still qualify as a knocking.

This example should go some way to explaining why we defined unitisable process tuples the way we did. Examples of class₄ verbs include *tykac* 'to be ticking', *mrugac* 'to be blinking', *kiwac* 'to be nodding', and *szelestac* 'to be rustling (discrete sound made by leaves, paper, etc.)'. The eventualities that interpret these verbs have natural subparts — and it seems reasonable to model these subparts as a sequence of subparts occurring through time (namely a sequence of ticks for *tykac*, a sequence of eye-closings for *mrugac*, a sequence of head-movements for *kiwac*, and a sequence of sounds for *szelestac*). Moreover, such events do seem to support a notion of 'minimal realisation', and modeling this intuition in terms of minimal sequences (namely, length of one sequence) of their subparts seems a natural idea.

In some cases it is harder to say what the sequence of subevents is. For examples, two other verbs in class₄ are *gwizdac* 'to be whistling' and *krzyczec* 'to be shouting'. Unless a context is supplied, it is rather hard to say exactly what a shouting or a whistling eventuality is made up of. Perhaps a shouting consists of a sequence of individual-word-shouts, and perhaps a whistling consists of a sequence of continuous whistling sounds divided by breathing periods? But unless we know whether we are dealing with the shouting of an infant or an adult, and unless we know whether we are dealing with the whistling of a train, a person, or a kettle, it is difficult to lay down criteria. However the task of formal semantic modelling is not to resolve the (difficult) issue of how human beings actually go about conceptually classifying various — rather its task is to provide a simple mathematical model of the result of such acts of classification, and that is what we have attempted to do here.

There is one remaining task — we have to define inception, realisation duration, and conclusion for unitisable process tuples. We do so as follows. Given an arbitrary unitisable process tuple

$$\langle type, \langle [a_1, b_1], \dots, [a_n, b_n] \rangle \rangle$$

then we define its inception to be a_1 , its conclusion to be b_n , and its realisation duration to be $[a_1, b_n]$. Note that in the special case of a minimal up (that is, a tuple of the form $\langle type, \langle [a, b] \rangle \rangle$) this definition says that the inception is a , the conclusion is b , and its realisation duration is $[a, b]$. Why define these concepts this way?

The point is this. It is true that (say) a typical knocking episode has ‘granularity’ or ‘bumps’. That is, it is made up of a sequence of distinct subevents (for example, each moment of contact between a knuckle and a door). Nonetheless for many purposes we don’t think about this substructure. That is, we often regard such eventualities as homogeneous entities: so to speak, we ‘smooth out’ the internal granularity. It is then natural to take the start of the eventuality to be the starting time of the first subevent, to take the conclusion of the eventuality to be the final time of the final subevent of the sequence, and to take the realisation duration of the entire eventuality as the period defined by these two extreme points. This is exactly what the definition given above does.

Class₅ eventualities A class₅ eventuality is a tuple of the form

$$\langle type, [a, b], \{b\} \rangle$$

where $type \in \text{Class}_5$. We call such entities *culmination tuples* (or more simply: *culminations*) (this terminology is taken from Moens and Steedman (1987, 1988)). We define the *realisation duration* of such a tuple to be $[a, b]$, we define the *inception* of such a tuple to be a , and we define the *conclusion* to be b . As usual, the realisation duration for a process is the period over which the eventuality takes place, the inception marks its start, and the conclusion marks its cessation. Note that (apart from their types) culminations are set-theoretically identical to culminated cps (thus we think of the right-open interval $[a, b)$ as the period over which the preparatory process runs, and the third component contains the culmination point b).⁹

⁹There is another interesting way of defining class₅ eventuality tuples: we could also allow some of them to have empty realisation durations. That is, as well as having eventuality structure of the form

$$\langle type, [a, b], \{b\} \rangle$$

where $type \in \text{Class}_5$, we could also have tuples of the form

$$\langle type, \emptyset, \{b\} \rangle$$

where $type \in \text{Class}_5$. Allowing this possibility is rather natural. For a start, it emphasises the symmetry between culminations and culminating processes. Recall that culminating processes were allowed to have an empty set of culminations; with this new definition of culmination, we have the reverse: we allow for the empty preparatory process. This gives us a natural way to handle the intuitions that some culminations are ‘point-like’, which would be useful for verbs as *rozpoznać* ‘to have recognized’. If we were working in a richer semantical setup it would be interesting to incorporate this distinction. We don’t do so here, because it is not a distinction directly exploited by Polish formants.

Here's an example. The tuple

$$\langle kupic, [2, 4], \{4\} \rangle$$

is a buying eventuality with inception at time 2, realisation duration $[2, 4]$, and conclusion 4.

5.3.2 The interpretations

Having defined our models, we are now ready to provide an interpretation for the verbs in the various classes. As we have already said, our semantics is going to make use of the modal logical idea of specifying when an expression holds at a given time. The expressions we will work with are the aspectually basic verbs, and the verbs formed from them by means of the various formants (empty prefix, *po-*, *na-*, and morphological change). So our task is to specify, given a model \mathbf{M} and a time t , the conditions under which we have that

$$\mathbf{M}, t \models verb$$

(that is, we have to define when an aspectually basic verb holds at time t in model \mathbf{M}) and the conditions under which we have that

$$\mathbf{M}, t \models formant(verb)$$

(that is, we have to define when an aspectually basic verb that has been modified by a formant in a manner permitted by our classification holds at time t in model \mathbf{M}). Let's turn to this task right away.

Interpreting class₅ verbs Let *verb* be any verb in class₅. According to the classification, this means that it is perfective, and that it is paired with an aspectual twin via morphological change. Thus we must define two interpretational clauses, and we define them as follows:

$\mathbf{M}, t \models mpc(verb)$ iff there is an class₅ eventuality e such that:

- (1) the type of e is *verb*, and
- (2) $t \in [a, b]$, where $[a, b]$ is the realisation duration of e .

$\mathbf{M}, t \models verb$ iff there is an class₅ eventuality e such that:

- (1) the type of e is *verb*, and
- (2) $b < t$, where b is the conclusion of e .

Incidentally, some readers may question whether choosing to call class₅ eventualities culminations is sensible: after all, Moens and Steedman (1987, 1988) define culminations as being point-like. But we think Moens and Steedman's word 'culmination' is a good way of thinking about the semantics of Polish verbs such as *kupować* 'to be buying', even though (in Polish) buying is not best thought of as a point. On the other hand, a Polish verb such as *rozpoznawać* 'to be recognizing' often should be viewed as point-like. Using the richer semantics just suggested would amount to saying that Polish culminations are possibly point-like eventualities.

The first clause (which deals with the imperfective case) says that the imperfective twin of a class₅ verb (for example, *kupic*, ‘to buy’) holds at a time t in some model if there is a class₅ eventuality in the model that has the correct type (that is, the model contains a buying eventuality) and moreover, the time t at which we are evaluating the verb must belong to the realisation duration of the buying eventuality. Or to put this more succinctly: *there must be an ongoing buying event at the time we evaluate the verb.*

Let’s make this more concrete. Suppose we are working with a model \mathbf{M} which contains the culmination tuple

$$\langle \textit{kupic}, [2, 4], \{4\} \rangle.$$

Then we have that

$$\mathbf{M}, 3 \models \textit{kupowac}.$$

Why? Well, *kupowac* is *mpc(kupic)*, and the model does indeed contain an eventuality of type *kupic* that is ongoing (after all, $3 \in [2, 4]$).¹⁰

The second clause (which deals with the perfective case) simply says that a class₅ verb (say, *kupic*, ‘to buy’) holds at a time t in some model if there is a class₅ eventuality in the model that has the correct type (that is, a buying eventuality) and moreover, the time t at which we are evaluating the verb comes later than the conclusion of the buying eventuality. Or to put this more succinctly: *there must be an completed buying event at the time we evaluate the verb.*

Let’s make this concrete. Once again, suppose we are working with a model \mathbf{M} which contains the culmination tuple

$$\langle \textit{kupic}, [2, 4], \{4\} \rangle.$$

Then we have that

$$\mathbf{M}, 5 \models \textit{kupic}.$$

Why is this? Because there is an eventuality of type *kupic* in the model that is completed at time 5 (after all, $4 < 5$).

Interpreting class₄ verbs Let *verb* be any verb in class₄. According to the classification, this means that it is imperfective, and that it is paired with perfective aspectual twins via empty prefixation, the *po-* prefix, and the *-na-* suffix. Thus we must define four interpretational clauses, and we define them as follows:

¹⁰Incidentally, recall that in the previous footnote we mentioned that it might be interesting to make use of class₅ eventuality structures with an empty realisation duration. Note that if we used the above definition to evaluate an imperfective verb in a model containing such a tuple, the verb could never be ongoing. This seems to be exactly what is required by some verbs, for example *rozpoznać* ‘to recognize-perf’ — intuitively, these are instantaneous eventualities and cannot be ongoing.

- $\mathbf{M}, t \models \textit{verb}$ iff there is an class_4 eventuality e such that:
- (1) the type of e is *verb*, and
 - (2) $t \in [a, b]$, where $[a, b]$ is the realisation duration of e .
- $\mathbf{M}, t \models \textit{ep}(\textit{verb})$ iff there is an **arbitrary** class_4 eventuality e such that:
- (1) the type of e is *verb*, and
 - (2) $b < t$, where b is the conclusion of e .
- $\mathbf{M}, t \models \textit{po}(\textit{verb})$ iff there is an **non-minimal** class_4 eventuality e such that:
- (1) the type of e is *verb*, and
 - (2) $b < t$, where b is the conclusion of e .
- $\mathbf{M}, t \models \textit{na}(\textit{verb})$ iff there is an **minimal** class_4 eventuality e such that:
- (1) the type of e is *verb*, and
 - (2) $b < t$, where b is the conclusion of e .

The first clause (which deals with the imperfective case) says that a class_4 verb (for example, *pukac*, ‘to be knocking’) holds at a time t in some model if there is a class_4 eventuality in the model that has the correct type (that is, the model contains a knocking eventuality) and moreover, the time t at which we are evaluating the verb belongs to the realisation duration of the knocking eventuality. Or to put this more succinctly: *there must be an ongoing knocking event at the time we evaluate the verb.*

Let’s look at a concrete example. Suppose we are working in a model \mathbf{M} where

$$\langle \textit{pukac}, \langle [1, 1.65], [2, 2.65], [3, 3.65], [4, 4.65] \rangle \rangle$$

is the only knocking eventuality. Then we have that

$$\mathbf{M}, 2.5 \models \textit{pukac},$$

and we also have that

$$\mathbf{M}, 3.9 \models \textit{pukac}.$$

Why is this? Because the model does indeed contain an eventuality of type *pukac* and whether the verb is uttered at time 2.5 or at time 3.9 the knocking event is ongoing: after all, the realisation duration of this knocking is $[1, 4.65]$, and $2.5 \in [1, 4.65]$ and $3.9 \in [1, 4.65]$.

One point is worth stressing. As this example is meant to illustrate, subevent ‘granularity’ is irrelevant to the semantics of the Polish imperfective. It is irrelevant in these examples that time 2.5 belongs to a knuckle-on-door subevent, while time 3.9 belongs to the brief period of silence between consecutive raps. The Polish imperfective ‘smooths out’ the internal granularity: all that matters is the realisation duration.

What about the perfective clauses? All three say that the perfective twin of a class_4 verb (say, *pukac*, ‘to be knocking’) holds at a time t in some model if there is

a class₄ eventuality in the model that has the correct type (that is, a knocking eventuality) and moreover, the time t at which we are evaluating the verb comes later than the conclusion of the knocking eventuality. Or to put this more succinctly: *there must be an completed knocking event at the time we evaluate the verb*. The only difference between the three clauses is in the type of knocking event that is demanded. The empty prefix is indifferent: any knocking event will do. The *po-* prefix, on the other hand, demands a non-minimal knocking eventuality, and *na-* suffix demands a minimal knocking eventuality.

Let's look at a concrete example. Once again, let's suppose we are working in a model \mathbf{M} where

$$\langle \text{pukac}, \langle [1, 1.65], [2, 2.65], [3, 3.65], [4, 4.65] \rangle \rangle$$

is the only knocking eventuality. Then we have that

$$\mathbf{M}, 5 \models \text{zapukac},$$

that

$$\mathbf{M}, 5 \models \text{popukac}$$

and that

$$\mathbf{M}, 5 \not\models \text{puknac}$$

(here we use the standard model notation $\not\models$ to indicate that *puknac* does *not* hold at time 5.)

Why? First, we remark that *zapukac* is *ep(pukac)*, that *popukac* is *po(pukac)*, and that *puknac* is *na(pukac)*. Second, note that the above knocking eventuality is non-minimal (it contains four subevents in its sequence) and that the time 5 at which we are evaluating these verbs is later than the conclusion of the knocking eventuality (after all, $4.65 < 5$). It follows that *zapukac* holds at time 5: after all there is a preceding knocking event, and the empty prefix isn't fussy about what type of knocking event it is. It also follows that *popukac* holds at time 5 too: after all the preceding knocking event is non-minimal, which is what *po-* requires. But it also follows that *puknac* does *not* hold at time 5: after all, *na(pukac)* demands that there be a *minimal* knocking event at a preceding time, and the only knocking event in model \mathbf{M} is non-minimal.

Let's consider another example. This time, suppose we are working with a model \mathbf{M}' where

$$\langle \text{pukac}, \langle [7, 7.65] \rangle \rangle.$$

is the only knocking eventuality. Then we have that

$$\mathbf{M}', 8 \models \text{zapukac},$$

and we also have that,

$$\mathbf{M}', 8 \models \text{puknac}$$

however we have that

$$\mathbf{M}', 8 \not\models \text{popukac}.$$

Why? The key difference between the two examples is that the knocking eventuality in model M' is minimal (it contains only one subevent in its sequence). It follows that *zapukac* holds at time 8: after all there is a preceding knocking event, and the empty prefix simply doesn't care what type of knocking it is. It also follows that *puknac* holds at time 8 too: after all, the preceding knocking event is minimal, which is precisely what *na-* wants. But then *popukac* does *not* hold at time 5. After all, *po(pukac)* demands a *non-minimal* knocking event at a preceding time, and the only knocking event in model M' is minimal.

Interpreting class₃ verbs Let *verb* be any verb in class₃. Such a verb is imperfective, and is linked to perfective aspectual twins via empty prefixation and the *po-*prefix. Thus we must define three interpretational clauses:

$M, t \models verb$ iff there is an class₃ eventuality e such that:
 (1) the type of e is *verb*, and
 (2) $t \in [a, b]$, where $[a, b]$ is the realisation duration of e .

$M, t \models ep(verb)$ iff there is an **culminated** class₃ eventuality e such that:
 (1) the type of e is *verb*, and
 (2) $b < t$, where b is the conclusion of e .

$M, t \models po(verb)$ iff there is an **non-culminated** class₃ eventuality e such that:
 (1) the type of e is *verb*, and
 (2) $b < t$, where b is the conclusion of e .

Let's consider the imperfective clause. The form it takes should be familiar to the reader: as with the other imperfective verbs we have discussed, the definition essentially says that a perfective verb holds at a time t if an eventuality of the relevant type is ongoing at that time. Let's consider a concrete example. Suppose we are working in a model M which contains only the following reading eventuality:

$$\langle pisac, [10, 15), \{15\} \rangle.$$

Then we have that

$$M, 12 \models pisac.$$

It should be clear why — the time 12 belongs to the interval $[10, 15]$ which is the realisation duration of an eventuality of type *pisac*.

What about the perfective clauses? Both say that the perfective twin of a class₃ verb (say, *pisac*, 'to be reading') holds at a time t in some model if there is a class₃ eventuality in the model that has the correct type (that is, a reading eventuality) and moreover, the time t at which we are evaluating the verb comes later than the conclusion of the reading eventuality. To put this more succinctly: *there must be a completed reading event at the time we evaluate the verb*. The only difference between the

clauses is in the type of reading event that is required. The empty prefix demands a culminated reading event. The *po-* prefix, on the other hand, demands a non-culminated reading eventuality.¹¹

Let's look at a concrete example. Once again, let's suppose we are working in a model \mathbf{M} where

$$\langle pisac, [10, 15), \{15\} \rangle.$$

is the only reading eventuality. Then we have that

$$\mathbf{M}, 16 \models napisac,$$

and that

$$\mathbf{M}, 16 \not\models popisac.$$

Why is this? First, we remark that *napisac* is *ep(pisac)*, and that *popisac* is *po(pisac)*. Second, note that the above reading eventuality is culminated (it culminates at time 15). It follows that *napisac* holds at time 16: after all, there is a preceding culminated reading event. It also follows that *popisac* does not hold at time 16. After all, *po(pisac)* demands that there be a preceding non-culminated reading eventuality, and the only reading eventuality in the model \mathbf{M} is culminated.

Let's consider another example. This time, suppose we are working with a model \mathbf{M}'

$$\langle pisac, [10, 13], \emptyset \rangle.$$

is the only reading eventuality. Then we have that

$$\mathbf{M}', 16 \not\models napisac,$$

and that

$$\mathbf{M}', 16 \models popisac.$$

Why? The key difference between the two examples is that the reading eventuality in model \mathbf{M}' is non-culminated (as the \emptyset indicates). It follows that *popisac* holds at time 16: after all there is a preceding non-culminated reading event. It also follows that *napisac* does not hold at time 16: after all, *ep(pisac)* demands that there be a preceding culminated reading eventuality, and the only reading eventuality in model \mathbf{M}' is non-culminated.

There is one other point worth making about the semantics of class₃ verbs as we have defined them: it automatically avoids the imperfective paradox. It seems to us that the imperfective paradox can only arise in model-theoretic setups that insist on always providing a culmination point for a culminating process. As the earlier examples were meant to suggest, we think it is a mistake to do so. It is certainly true that in some sense a reading activity 'typically' reaches a culmination, but as our example of "Harry Potter" was meant to suggest, 'typically' certainly does not mean 'always'. Indeed, it is likely that thousands of readers worldwide did not make it to

¹¹As Czochralski puts it, "Die Delimitativa konnotieren die Handlung als eine teilweise ausgeführte" (Czochralski, 1975, page 21).

the end of “Harry Potter 5” — nonetheless, all of them were engaged in the activity of reading. Similarly, crossing the street ‘typically’ leads to reaching to the other side, but as our tale of Piotr was meant to illustrate (and as every anxious parent of young children will agree) the getting to the other side is not something that can safely be assumed.

To put it another way, readings and crossings of the streets are activities which human beings classify as culminating processes, but being a culminating process by no means entails that the culmination will ever be reached. It therefore strikes us as misguided to use a model-theoretic representation of a culminating process which builds in the assumption that the culmination always exists. The distinction we have drawn between culminated cps and non-culminated cps precisely models the distinction between those cps which have a culmination and those which do not. Hence it certainly does not follow that just because a reading is in progress, at some time later the reading will reach its culmination — the reading may be over because the reader dies of boredom instead.

The imperfective paradox can only arise when culminations are invariably built into model-theoretic representations of culminating processes. The semantics we have given above does not do this, hence we simply bypass the problem. Moreover, note that we did *not* introduce the distinction between culminated cps and non-culminated cps to deal with the imperfective paradox at all. On the contrary, we introduced it precisely to deal with *completed* events, that is with *perfectivised* events. The Polish aspectual system encodes two ways of completing a cp. The first, encoded by the empty prefix, insists that the culmination point was reached. The second, encoded by *po-*, insists that there was no culmination point; the activity only ended, so to speak, ‘atypically’. In short, the crucial model-theoretic distinction we have made between culminated and non-culminated cps was motivated by considerations that had nothing to do with the imperfective paradox. But introducing it has the pleasant side effect that the imperfective paradox simply melts away.

Interpreting class₂ verbs Let *verb* be any verb in class₂. Such a verb is imperfective, and gives rise to perfective aspectual twins via the *po-* prefix. Thus we must define two interpretational clauses:

$\mathbf{M}, t \models verb$ iff there is an class₂ eventuality e such that:
 (1) the type of e is *verb*, and
 (2) $t \in [a, b]$, where $[a, b]$ is the realisation duration of e .

$\mathbf{M}, t \models po(verb)$ iff there is an class₂ eventuality e such that:
 (1) the type of e is *verb*, and
 (2) $b < t$, where b is the conclusion of e .

The form our definitions are taking should now be becoming very familiar. Suppose we are working in a model \mathbf{M} which contains the following sitting down event-

ality

$$\langle \textit{siedziec}, [-1, 4] \rangle.$$

It follows straightforwardly from these definitions that

$$\mathbf{M}, 3 \models \textit{siedziec},$$

and, if you bear in mind that *posiedziec* is *po(siedziec)*, it follows just as straightforwardly that

$$\mathbf{M}, 8 \models \textit{posiedziec}.$$

Interpreting class₁ verbs Let *verb* be any verb in class₁. Such a verb is imperfective, and is paired with a perfective aspectual twin via its empty prefix. Thus it looks as though we have only to give two interpretational clauses — unfortunately, this is where we encounter perfective states, so three interpretational clauses will be required.

Recall that class₁ is made up of two semantically distinct types of verbs: states and gradual transitions. When perfectivised, gradual transitions have the (by now familiar) ‘completed’ reading. However, perfectivised state verbs in Polish are inchoative (as they are in many other languages). Moreover, recall from the previous chapter that we could not find an aspectual formant that decisively split class₁ verbs into its two subpart. There was a regularity that gradual transitions always take *z(a)-* as their empty prefix — and indeed, we have only been able to find a few state verbs that take *z(a)-*. Nonetheless it is not really clear whether the state/gradual transition distinction is a distinction induced by the Polish aspectual system. Probably the most sensible way to proceed is simply to assume that each verb in class₁ is marked for inchoativity by a semantic feature [+inc] or [–inc].

Let us assume that the class₁ verbs have been marked in this way. We can then interpret as follows:

$$\begin{aligned} \mathbf{M}, t \models \textit{verb} \quad \text{iff} \quad & \text{there is an class}_1 \text{ eventuality } e \text{ such that:} \\ & (1) \text{ the type of } e \text{ is } \textit{verb}, \text{ and} \\ & (2) t \in [a, b], \text{ where } [a, b] \text{ is the realisation} \\ & \quad \text{duration of } e. \end{aligned}$$

$$\begin{aligned} \mathbf{M}, t \models \textit{ep(verb[-inc])} \quad \text{iff} \quad & \text{there is an class}_1 \text{ eventuality } e \text{ such that:} \\ & (1) \text{ the type of } e \text{ is } \textit{verb}, \text{ and} \\ & (2) b < t, \text{ where } b \text{ is the conclusion of } e. \end{aligned}$$

$$\begin{aligned} \mathbf{M}, t \models \textit{ep(verb[+inc])} \quad \text{iff} \quad & \text{there is an class}_1 \text{ eventuality } e \text{ such that:} \\ & (1) \text{ the type of } e \text{ is } \textit{verb}, \text{ and} \\ & (2) a = t, \text{ where } a \text{ is the inception of } e. \end{aligned}$$

That is, all class₁ verbs are interpreted as ongoing (or ‘onholding’ for states) at time *t*; this is the content of the first clause. On the other hand, verbs obtained by

empty prefixations from class₁ verbs that are marked negatively for inchoativity (that is, gradual transitions) are interpreted as completed; this is the content of the second clause. As we saw in the previous chapter, all the verbs to which this second clause applies have *z(a)-* as their empty prefix. Finally, for verbs obtained by empty prefixations from class₁ verbs that are marked positively for inchoativity, we demand that the time *t* at which we evaluate these verbs be the inception (or ‘onset’) of the state; this is the content of the third clause.

Let’s look at an example. Suppose we are working in a model **M** which contains only the following growing fat gradual transition

$$\langle \textit{grubnac}, [2, 7] \rangle$$

and only the following state of believing

$$\langle \textit{wierzyc}, [2, 4] \rangle.$$

Then we have that

$$\mathbf{M}, 3 \models \textit{grubnac},$$

as the growing fat is ongoing at time 3, and that

$$\mathbf{M}, 3 \models \textit{wierzyc},$$

as the believing is onholding at time 3. Furthermore, we have that

$$\mathbf{M}, 16 \models \textit{zgrubnac} ,$$

for *zgrubnac* is *ep(grubnac)*, and *grubnac* is *[-inc]*, and the growing fat event is completed at time 16. However, we have that

$$\mathbf{M}, 16 \not\models \textit{uwierzyc},$$

for although *uwierzyc* is *ep(wierzyc)*, and although the state of believing is over at time 16, *wierzyc* is *[+inc]*. Instead, we have that

$$\mathbf{M}, 2 \models \textit{uwierzyc},$$

for time 2 is the inception of the believing state.

5.3.3 Discussion

We believe that our formalization of the semantics induced by the classification gives strong support to our claim that the semantics of Polish aspect is essentially temporal. It would be hard to devise a substantially simpler formalisation than the one just given. In essence, we took the basic idea of modal logic (evaluation at states inside models), took a simple off-the-shelf picture of the flow of time (the real numbers), and then constructed simple denotations for the various types of eventualities. The basic

building blocks for these denotations were the kind of set-theoretic ingredients common in temporal semantics: closed intervals and sequences of closed intervals. The only novelty was to introduce an explicit set-theoretic ‘flag’ to mark the distinction between culminated and non-culminated cps (recall that the third component of a cp was the set of culminating points for the cp, and that this could either be the empty set \emptyset or the singleton set $\{b\}$, where b was the conclusion of the cp). But simple though it was, this temporal machinery enabled us to model the main distinction noted in the informal discussion of the previous chapter. We conclude that (viewed semantically) the primary function of Polish aspect is to govern certain, essentially temporal, properties of eventualities.

What are these “certain, essentially temporal, properties of eventualities” that Polish aspect governs? Our semantics gives us a clear and (with the exception of perfective states) essentially uniform answer: it says that ‘imperfectivity’ boils down to ‘ongoing’, and ‘perfectivity’ (except for stative verbs) boils down to ‘completed’.

This answer is close to many traditional views. Indeed, as far as we can see, when it comes to imperfective verbs, our answer is almost completely traditional. Recall that all the imperfective verbs in our classification (that is, all the verbs in class₁, class₂, class₃, and class₄, and all the verbs formed by morphological change from a verb in class₅) have the following interpretation:

$$\begin{aligned} \mathbb{M}, t \models \textit{verb} \quad \text{iff} \quad & \text{there is an eventuality } e \text{ such that:} \\ & (1) \text{ the type of } e \text{ is } \textit{verb}, \text{ and} \\ & (2) t \in [a, b], \text{ where } [a, b] \text{ is the realisation duration of } e. \end{aligned}$$

This seems (by and large) to reflect what is meant in traditional accounts when they say that imperfectives code for ongoing eventualities.

What about the perfective? With the exception of perfective statives, once again our semantics gives a uniform answer:

$$\begin{aligned} \mathbb{M}, t \models \textit{formant}(\textit{verb}) \quad \text{iff} \quad & \text{there is an **appropriate** eventuality } e \text{ such that:} \\ & (1) \text{ the type of } e \text{ is } \textit{verb}, \text{ and} \\ & (2) b < t, \text{ where } b \text{ is the conclusion of } e. \end{aligned}$$

That is, in all cases perfectivised verb forms demand the completion of some event. But what kind of event? As we have seen, the various formant/verb combinations can be quite choosy about what they are looking for. For example, when *po-* is applied to a class₃ verb, it wants to find a completed non-culminated cp, and when *na-* is applied to a class₄ verb it wants to find a completed minimal cp. In short what we have here is (by and large) a more nuanced version of the traditional view that perfective forms demand completed events.

But why do we say that our accounts of imperfective and perfective forms are ‘by and large’ traditional? This is because some writers on aspect seem to draw an additional conclusion from the link between imperfectives and ongoing eventualities

and perfectives and completed eventualities, and we find some of these conclusions misplaced.

Consider Comrie. Comrie endorses the ongoing/completed distinction, but when discussing imperfective forms he goes on to say that:

Another way of explaining the difference between perfective and imperfective meaning is to say that the perfective looks at the situation from outside, without necessarily distinguishing any of the internal structure of the situation, whereas the imperfective looks at the situation from inside, and as such is crucially concerned with the internal structure of the situation. . . (Comrie, 1976, page 4)

Now, it is not entirely clear what this quotation means — and as it comes from the beginning of a textbook devoted to presenting an informal overview of aspect in many languages, it is unfair to demand complete precision. Nonetheless, it seems reasonable to claim that this quotation comes close to getting matters completely backwards, at least as far as the Polish data is concerned.

Is the imperfective form really “crucially concerned with the internal structure of the situation”? This is not borne out by the semantics of class₄ verbs. Recall our discussion of the knocking example. Knockings have clear internal structure — brief periods of knuckle impact interspersed with brief periods of silence. Nonetheless, as we pointed out, for the imperfective form it makes no difference whether we utter the verb during a knuckle-on-the-door subevent, or during a silent period. That is, the imperfective form in Polish seems designed precisely to *ignore* any internal structure an event may possess. All that is important to the semantics of the Polish imperfective is the realisation duration; the fine structure of the subevents can be ignored.¹²

Moreover — at least in Polish — perfective forms certainly *can* be sensitive to the internal structure of eventualities. As we have seen, with class₃ verbs it is important whether we perfectivise with an empty prefix or *po-* (the first choice demands a completed culminated cp, the latter a completed non-culminated cp), and with class₄ verbs the choice between perfectivising with an empty prefix, *po-*, and *na-* gives rise to demands for completed arbitrary, non-minimal, and minimal ups, respectively.

Thus when we say that our semantics assigns the meaning ‘ongoing’ to Polish imperfective forms and ‘completed’ to (non-stative) Polish perfective forms, this claim should be read in the strictly temporal terms given by our formal semantics. Our use of these traditional terms is *not* intended as an endorsement of other views that some writers seem to treat as part and parcel of these terms. In particular, we are emphatically not claiming that imperfectives ‘see internal structure’ and perfective forms don’t; in fact, we are claiming the opposite.

But as the long as the reader bears this caveat firmly in mind, there can be no harm in using the traditional ongoing/completed terminology to christen all thirteen verb

¹² Parenthetically, our view that only the realisation duration is important for the Polish imperfective seems to fit better with some of Comrie’s other observations than does his own internal-structure-is-crucial remark. In particular, Comrie likes to view the imperfective as providing a temporal setting for participial constructions. But what you need for such a setting is essentially a unstructured space — you don’t need unnecessary furniture cluttering things up.

classes in our classification. Indeed, this terminology gives us a nice way of thinking about verb pairs in Polish:

IMPERFECTIVES	PERFECTIVES
Class 1 Statives and Ongoing gradual transitions	Inchoatives and Completed gradual transitions
Class 2 Ongoing processes	Completed processes
Class 3 Ongoing culminating processes	Completed culminated culminating processes Completed non-culminated culminating processes
Class 4 Ongoing unitisable processes	Completed arbitrary unitisable processes Completed non-minimal unitisable processes Completed minimal unitisable processes
Ongoing culminations	Class 5 Completed culminations

Before moving on, some final remarks on our formalization. We kept it simple to let the important ideas emerge clearly, but this does not mean that it is incompatible with more sophisticated semantical setups. Indeed there are a number of natural ways of scaling it up. For a start, it would be interesting to move on from here to investigate the interaction of aspect with tense in Polish, and such investigations are probably better conducted in an interval-based setting (that is, in a form of modal logic where expressions are evaluated at temporal intervals rather than temporal points). Indeed, in principle we see no barriers to drawing the kinds of distinction given by our semantics in the models uses in (say) Montague semantics or DRT, and ultimately we hope to do this. Lastly, it may be that the semantics given here is of some logical interest. While the tradition of tense-logic is far better known, there is a small literature on ‘logics of aspect’ (a key writer on this topic is Antony Galton; Galton (1984, 1987)). It would be interesting to make a connection with this line of work.

5.4 Remarks on adverbials

This thesis is largely concerned with the lexical semantics of Polish verbs, and in particular with the aspectual distinctions they draw. Nonetheless, ultimately the semantic

distinctions drawn by our classification will have to be incorporated into a compositional theory. This task is well beyond the scope of this thesis, but it is interesting to have a preliminary look at the sort of phenomena that occur at higher levels.

We shall follow Verkuyl in using ‘*in/for* (x time)’ test in order to determine the aspect of Slavic sentences (Verkuyl, 1999, page 119, 125, etc.). A little note of explanation. When possible, we chose transitive verbs (for example, some class₁ and class₃ verbs have a direct object, and some do not) and we chose examples of state verbs which have an internal argument, in order to make the link with parallelism-based approaches discussed in Chapter 3 as clear as possible. We then also always give as example a count noun internal argument that is interpreted as [+SQA]/quantized, and a bare plural internal argument that is interpreted as [-SQA]/cumulative.

- imperfective verbs: ‘*for/*in* (x time)’
 1. state
*Jan lubił ptaki/tego ptaka*¹³ ‘Jan liked-impf birds/(this) bird for/*in a year’
 2. gradual transition
*Jan mądrzał przez/*w rok* ‘Jan grew wise-impf for/*in a year’
 3. ongoing process
*Jan spacerował przez/*w godzinę* ‘Jan walked-impf for/*in an hour’
 4. ongoing cp
*Jan pisał list/listy przez/*w godzinę* ‘Jan wrote-impf a letter/letters for/*in an hour’
 5. ongoing up
*Jan pukał do drzwi przez/*w godzinę* ‘Jan knocked-impf at the door for/*in an hour’
 6. ongoing culmination
*Jan kupował książkę/książki przez/*w godzinę* ‘Jan bought-impf a book/books for/*in an hour’
- perfective verbs: ‘*in/*for* (x time)’¹⁴
 1. inchoative
*Jan polubił ptaki/tego ptaka w/*przez rok* ‘Jan liked-perf birds/this bird in/*for a year’
 2. completed gradual transition
*Jan zmądrzał w/*przez rok* ‘Jan grew wise-perf in/*for a year’

¹³The demonstrative pronoun (in accusative case) *tego* ‘this’ is added, since the sentence without it is unnatural.

¹⁴Note that completed process, completed non-culminated cps, and completed non-minimal up — that is, verbs modified by delimitative *po-* — do not select for ‘*in/for* (x time)’ adverbial modification. However, **w/?przez godzinę* ‘*in/?for (an) hour’ indicates that ‘for (an) hour’ is better than ‘for (an) hour’. Moreover, note that in the glosses of delimitative verb instead of ‘-perf’ we use ‘-po/perf’, for the reader’s comfort (similarly, to indicate that the verb has a ‘minimal duration’ reading, we use ‘-(md)perf’ instead of ‘-perf’).

3. completed process
*Jan pospacerował *w/?przez godzinę* ‘Jan walked-*po/perf* *in/?for an hour’
4. completed culminated cp
*Jan napisał list/listy w/*przez godzinę* ‘Jan wrote-*perf* a letter/letters in/*for an hour’
5. completed non-culminated cp
*Jan popisał list/listy *w/?przez godzinę* ‘Jan wrote-*po/perf* *in/?for an hour’
6. completed arbitrary up
*Jan zapukał do drzwi w/*przez godzinę* ‘Jan knocked-*perf* at the door in/*for an hour’
7. completed non-minimal up
*Jan popukał do drzwi *w/?przez godzinę* ‘Jan knocked-*po/perf* at the door *in/?for an hour’
8. completed minimal up
*Jan puknął do drzwi w/*przez godzinę* ‘Jan knocked-(*md*)*perf* at the door in/*for an hour’
9. culmination
*Jan kupił książkę/książki w/*przez godzinę* ‘Jan bought-*perf* a book/books in/*for an hour’

This long list of sentences shows that the applicability of the ‘*in/for* (x time)’ adverbials depends fully on the aspect of the verb, and is not affected by the quantificational nature of the internal argument. With an exception of the delimitative verbs (that is, completed processes, completed non-culminated cps, completed non-minimal ups), to which this test cannot be successfully be applied, all imperfective verbs combine with ‘*for* (x time)’, and all perfective verbs combine with ‘*in* (x time)’ adverbials.

But there is more to the ‘*in/for* (x time)’ test than that. In contrast to Germanic languages, in Polish this adverbial test certainly *is* applicable to verbs themselves. Since we follow Verkuyl in assuming that this test detects aspect (that is, [+/-T] as well as [+/-P]), we conclude that in contrast to Germanic, where, as Verkuyl argued, aspect is only a matter of verb phrases and sentences, aspect in Polish is very much a matter of the verb level as well.

Consider one more the verbs that have been used in examples above — however, this time in their *infinitive* form.

- imperfective verbs: ‘*for/*in* (x time)’
 1. state
*lubić przez/*w rok* ‘to like-*impf* for/*in a year’
 2. gradual transition
*małdrzeć przez/*w rok* ‘to grow wise-*impf* for/*in a year’

3. ongoing process
*spacerować przez/*w godzinę* ‘to walk-impf for/*in an hour’
 4. ongoing cp
*pisać przez/*w godzinę* ‘to write-impf for/*in an hour’
 5. ongoing up
*pukać przez/*w godzinę* ‘to knock-impf for/*in an hour’
 6. ongoing culmination
*kupować przez/*w godzinę* ‘to buy-impf for/*in an hour’
- perfective verbs: ‘in/*for (x time)’
 1. inchoative
*polubić w/*przez rok* ‘to like-perf in/*for a year’
 2. completed gradual transition
*zmańdrzeć w/*przez rok* ‘to grow wise-perf in/*for a year’
 3. completed process
*pospacerować *w/?przez godzinę* ‘to walkpo/perf *in/?for an hour’
 4. completed culminated cp
*napisać w/*przez godzinę* ‘to write-perf in/*for an hour’
 5. completed non-culminated cp
*popisać *w/?przez godzinę* ‘to write-po/perf *in/?for an hour’
 6. completed arbitrary up
*zapukać w/*przez godzinę* ‘to knock-perf in/*for an hour’
 7. completed non-minimal up
*popukać *w/?przez godzinę* ‘to knockpo/perf *in/?for an hour’
 8. completed minimal up
*puknąć w/*przez godzinę* ‘to knock-(md)perf in/*for an hour’
 9. culmination
*kupić w/*przez godzinę* ‘to buy-perf in/*for an hour’

The examples show that Polish verbs to which the ‘in/for (x time)’ adverbials are applicable, choose in their infinitival form one of the two adverbials. A comparison with the first set of examples shows that the adverbial modification that a verb selects for in its infinitival form is precisely the same as the adverbial modification that the sentence containing that verb allows for. This leads us to conclude that aspect in Polish, as expressed by the verb in its infinitival form, determines the aspect of the sentence that contains that verb. One of the most interesting tasks for future work will be to investigate how the insights of Verkuyl’s approach can be combined with the verb classification in a way that accounts for the patterns of adverbial modification just observed.

5.5 A diachronic perspective on the classification

In Chapter 1 we sketched the evolution of the Polish aspectual system, and we believe that the diachronic perspective helps us to understand why aspect in Polish looks the way it does (that is, the way captured by our classification). In Chapter 1 we argued that Proto Slavic inherited an incomplete system of aspect and faced the difficulty of clearly marking the difference between completed and ongoing eventualities. In order to fill in the gaps, it started to hijack various methods of word-formation to develop a full system of aspectual pairing. Dostál (1954) describes the Proto Slavic system of verbs in the following way:

Ve všech slovanských jazycích vidíme nedokonavá simplicia proti dokonavým kompositům, t.j. slovesům s předponou. Simplicia pravidelně představují nedokonavý člen vidové korelace, kdežto komposita vyjadřují člen dokonavý. Aby aspektový systém, t. j. systém především protikladu D : ND, mohl plnit své úkoly, je nutno, aby jej bylo možno vybavit pro každý lexikální význam oběma slovesy vidové dvojice, neboli je tu neustále potřeba opatřovati si pro týž sémanticko-lexikální obsah morfologické výrazy jak pro dokonavost, tak pro nedokonavost. To se děje jednak tvořením simplicíí i komposit, jednak odvozováním (derivací) imperfektivních simplicíí i komposit, tak zvaných morfologických iterativ. Obě tendence jsou neobyčejně silné a živé, a to právě proto, že jsou podstatou morfologického vyjádření protikladného poměru D : ND. (Dostál, 1954, page 18)

[In all Slavic languages, we see imperfective simplicia opposing perfective composita, i.e. prefixed verbs. Simplicia, as a rule, represent the imperfective member of an aspectual pair, whereas the composita represent the perfective member. In order for the aspectual system, i.e. primarily the system of the contrast D:ND [completeness:non-completeness], to fulfil its duty, it is necessary to express every lexical meaning by both verbs of an aspectual pair, as it is continuously necessary to obtain morphological expressions of both perfectivity and imperfectivity for the same semantico-lexical content. This happens through the formation of simplicia and composita on the one hand, and the derivation of imperfective simplicia and composita, so-called morphological iterativa, on the other. Both tendencies are unusually strong and lively, especially because they are the nature of the morphological expression of the oppositional relation D:ND [completeness:non-completeness].]

Similarly, Rospond (1971) writes:

Zachodziła bowiem istotna potrzeba, aby w obrębie czasownika wprowadzić wyraziste wykładniki głównie prefiksalne na oznaczenie wielkiego bogactwa przede wszystkim aspektowego. (Rospond, 1971, page 227)

[There was namely an essential need of introducing within the domain

of the verb expressive means, mainly prefixal, to denote a great, mainly aspectual, abundance.]

The hijacked prefixes and suffixes started to undergo a lengthy and ongoing process of grammaticalisation.

As we showed in Chapter 1, morphonological change as it exists in contemporary Polish (and as we described it in Chapter 4), arose through the merging of several word-formational (in particular, theme forming) suffixes; the origin of these suffixes can be traced back to Proto Indo-European, where they determined the conjugational class of a given verb, and at the same time marked the difference between completed and ongoing aspect. The merging happened through the process of morphological perintegration and absorption, and was conditioned by the tendency to analogy.

In Chapter 4 we saw that the process of morphonological change is complex from a formal perspective — nonetheless, it is aspectually uniform. The formal complexity of the imperfectivising operation of morphonological change is explained by the different word-formational means that were hijacked to perform it. As the history of this imperfectivising operation has shown, morphonological change can be broken down to two main components: a component involving formant *-wa-*, and a component involving formant *-a-*; these formants (and especially, the formant *-a-*) often induced additional vowel changes in the root.

Let us briefly summarize the evolution of this process as we presented it in Chapter 1. The imperfectivising formant *-ywa-* developed by morphological perintegration and absorption from the most expansive Proto Slavic suffix, the suffix **-va-*. Formant *-va-* also formed the basis for *-awa-*, another absorptive formant. By analogy to *-y/awa-*, the conjugational theme suffix *-owa-* was hijacked as an aspectual formant. Finally, *-ywa-* started to replace its competitors. Formant *-a-* originated from the theme-morphemes of three different conjugational classes: from a very productive Proto Slavic suffix **-ja-*, which was often accompanied by vowel changes in the root, from Proto Slavic **-a-*, and from Proto Slavic **-ě-*. Formant *-a-* which developed from **-ě-* was part of the theme of the imperfective counterpart of the perfective verb with **-nq-/nq-*, and it seems that it was not hijacked for imperfectivising purposes (rather, it was the theme suffix of its perfective counterpart **-nq-/nq-*, that was hijacked as a perfectivising formant). Formant *-a-* which developed from **-a-* or **-ja-*, got hijacked to imperfectivise perfective verbs. Imperfectivising formant *-a-* started at a very early stage to interact with **-va-/wa-*, and its descendants. Both formants were used in Proto Slavic to describe iterated and ongoing single-time events.

Let us look at a concrete example. Consider contemporary Polish verbs *kupować* ‘to buy-impf’, *dawać* ‘to give-impf’, *wygrywać* ‘to win-impf’, *ogłaszać* ‘to announce-impf’. Historically, the four instances of the imperfectivising operation developed from three different verbal themes, which formed bases for different conjugational classes. To be more precise: *-owa-* was extracted from **kup-ov-a-[ti]* ‘to buy-impf’, *-wa-* from **da-va-[ti]* ‘to give-impf’, *-a-* from **oglaš-a-ti* ‘to announce-impf’, and *-awa-* arose from (roughly, Middle) Polish *wygra-wa-ć* ‘to win-impf’ by perintegration and absorption. As we mentioned in Chapter 1, these morphemes constitute bases for

different conjugational classes, and some of them even function as word-formational morphemes in a very strict sense: they derive verbs from nouns or adjectives. The formal differences among them are reflections of their different origin. But these differences do not matter since the formants were hijacked for one uniform goal: governing the imperfectivisation operation.

In contemporary aspectology some researchers simply speak of *the* imperfectivising suffix *-yw-*, as if the process of morphological change was a formally uniform process which simply involved inserting the suffix *-yw(a)-* into a perfective verb. The formal (and semantic) uniformity of the imperfectivising process is taken as an indication of a fundamental difference between verbal pairs derived by imperfectivisation, and those derived by perfectivisation by empty prefixes. But this view does not seem strongly supported from the point of view of the evolution of Polish aspect system.

Hence we ourselves used the Czochralski-inspired term ‘morphological change’ in order to indicate that formally, the process of imperfectivisation involves morphological and phonological changes — to be more precise, it embraces formants which originate from *-wa-* (**-va-*), as well as formant *-a-* (**-ja-*, **-a-*), possibly accompanied by vowel changes within the root.

How does the evolution of the *-nq-* suffix fit into our classification? We have seen examples of (contemporary) Polish computer verbs that indicate that this suffix is used as an uniform perfectivising operator. This suffix is a direct continuation of the Proto Slavic suffix *-nq-* that formed a theme of a certain conjugational class (which except for a few exceptions consisted of perfective verbs (Lehr-Splawiński and Bartula, 1959, page 64f.)). In Proto Slavic, it got hijacked, and apparently it immediately became very productive in making perfective verbs (Lunt, 1974, page 79). Contemporary Polish suggests that the expansion of this suffix has been growing through the centuries.

Finally, let us turn to empty prefixes. We said in Chapter 1 that in contrast to suffixes, and phonological changes, which are a Proto Indo-European inheritance, prefixes are a Proto Slavic innovation. The need of establishing a full system of verb pairs was pressing, and the suffixes alone were apparently not enough to meet it. Most prefixes that were hijacked as perfectivising formants originated from prepositions. The closeness between prefixal formant and verb was rather loose in Proto Slavic, and in the early stages of Polish. There existed a great deal of freedom in the application of prefixes: formally different prefixes could have the same perfectivising effect on a given verb. Or to put it another way: the system of prefixation was full of prefixal doublets. Only in the last thirty years of the 19th century and at the beginning of the 20th century did a ‘stabilization’ of prefixal forms take place. The number of prefixal doublets was drastically reduced due to the crystallisation of a unique perfectivising prefixal formant for a given verb — in other words, due to the crystallisation of ‘empty’ prefixes. Although no unique prefix applicable to all verbs has emerged (as happened in Lithuanian), one of the prefixes developed as the most productive and most grammaticalised prefix: namely, the prefix *z(a)-*. We showed in Chapter 1 that prefixation as a means of forming aspectual pairs is a newer process than suffixation, and this may be one of the reasons why it is more mixed than imperfectivisation by morphological

change, and much more mixed than perfectivisation by the semelfactive suffix *-ną-*.

In this thesis we have defended the view that aspectual pairing in Polish exists, and makes an important contribution to verbal temporal semantics (for the most part, by distinguishing completed from ongoing eventualities).

We make no claim that aspectual pairs are forms of the same verb. For a start, this is clearly not true for the few remaining Polish suppletive pairs, which consist of two different verbs. Moreover, if our views on the evolution of the Polish aspectual system are correct, it would make little sense to claim that such pairs are pairs of verb forms. Rather, the situation seems to be more like this. Aspectual pairing was needed to play a semantic role, and Polish hungrily took everything that could be used to this purpose.

But doesn't the view that we can for aspectual purposes regard the members of aspectual pairs as distinct verbs not conflict with the fact that we use formants to make the pairs? After all, is there not a natural 'directionality' when it comes to formants? For example, a natural 'direction' is from on-going culminating process to a completed culminated cp, and from culmination to on-going completed culmination.

In our view there is no conflict at all. Viewed diachronically, it is true that there is a certain 'directionality'. Some verbs 'chose' prefixal, and some other 'chose' suffixal formants — and there is directionality in this. Nonetheless, viewed synchronically, at the end of the day, all we have is an abstract system of aspectual pairs. The directionality reflects the history, and not relevant semantic distinctions. A class₅ verb is not more semantically primitive than its empty prefixed class₃ cousin, nor is a class₃ verb semantically more primitive than its twin formed by morphological change. History has a direction, but the modern system is an abstract system of pairs of verbs living in almost perfect semantic harmony, one dealing with ongoing eventualities, the other with completed eventualities. The only jarring note is the inchoative reading given to perfective states (in our view, solving this puzzle will require deeper understanding of the differences between states and events).

5.6 Concluding remarks

We conclude this thesis by briefly describing what we have done, what we believe we have contributed to the study of Polish aspect, and where we are going.

First, what have we done?

Basically, we trusted the intuition that Polish verbs come in pairs, the intuition built into every Polish dictionary and textbook of Polish grammar. This led to the key idea underlying the thesis: breaking verb apart from formant. We isolated the operations that gave rise to these pairs, using the secondary perfectivisation and imperfectivisation tests as our guides. We classified Polish verbs on this basis, and investigated what emerged semantically. We claim that (apart from perfective states) what we get is in essence an ongoing/completed distinction, but with an interesting twist built in: some Polish verbs (namely those dealing with culminating processes and unitisable processes) allow for two, or even three perfectivising options.

It is worth remarking that this is very much a thesis in the Western tradition. This may not be obvious. After all, we have tried to take a very close look at the concept of verb pairing in Polish both synchronically and diachronically, and we have tried to address the concerns of researchers of the Slavic school. Nonetheless, the methodology which drives this thesis is essentially post-Chomskian. That is, we took a native speaker intuition seriously (namely the existence of verb pairs) and tried to systematically work out what gave rise to this intuition. This methodology is not the traditional Slavic one.

So when we ask the question what does this thesis have to offer, we actually have to ask two questions: what do we offer to the Western tradition, and what do we offer to the Slavic tradition?

We think the answer to the first question should by now be clear. Since our work is carried out in the Western tradition, it has to be judged according to the usual standards of Western theoretical linguistics, which in this case means, it has to be judged according to how much light it throws on aspectual phenomena. And we believe that our study has made some important advance from the Western perspective. First, we have shown that the most fruitful level at which to approach Polish aspectual pairing is at the word-formational level rather than at the morphematic level used by Slavic linguists. Second, we have shown that the level of verb in Polish systematically supports a number of important semantic distinctions. These distinctions are based on the familiar distinctions between ongoing vs. completed, but our analysis also shows that verbs in different classes may well be completed in different ways. In particular, we have shown that Polish culminating process verbs can be completed in two ways, and Polish unitisable process verbs in three ways. Third, we have shown that it is possible to formalize the key ideas of our semantic analysis; given the formal nature of contemporary Western linguistics, and given that we eventually hope to lift our analysis to the verb phrase, sentence, and discourse level, this is important.

But given that our approach is Western, the much more interesting question is what does our thesis offer to the Slavic tradition? To put it another way, why should a Slavic scholar be interested in our approach?

First, we believe that our (Western) methodology has a lot to offer. Consider the way Isačenko tries to argue for what a ‘true’ aspectual pair really is, and why a pair of verbs linked by empty prefixation is not a true aspectual pair. As we have already discussed, Isačenko argues against the wide-spread strategy of treating pairs of verbs established by empty prefixes as instances of ‘true’ aspectual pairs. Since the empty prefixes express a resultative shade of meaning, empty prefixed verbs are not completely synonymous with the basic verbs. Hence, such prefixal pairs of verbs are *almost* synonymous — and according to Isačenko, it is the “*almost*” that should be emphasized:

In der traditionellen Grammatik unterschied man einerseits “lexikalische” Verbalpräfixe, d.h. solche Präfixe oder Präfixbedeutungen, deren Verbindung mit einem Simplex zur Entstehung neuer lexikalischer Einheiten, neuer selbständiger Verben führt, z.B. das Präfix *pere-* in *perepisat* ‘abschreiben, von neuem schreiben’. Andererseits glaubte man von grammatischen

oder “leeren” Präfixen sprechen zu können (“*préverbes vides*” in der französischen Terminologie). Als “leere” Präfixe wurden solche verbale Präfixe angesehen, die angeblich keinerlei lexikalische Veränderungen in der Realbedeutung des Verbs bewirken und ausschliesslich der Bildung “echter” perfektiver Aspektpartner dienen, z.B. das Präfix *na-* in *napisat'* ‘schreiben’. Diese überaus vereinfachte Darstellung hat in allen Lehrbüchern des Russischen Eingang gefunden. Nun ist es auffallend, dass in allen Grammatiken immer wieder dieselben Verben aufgezählt werden, bei denen die Präfigierung angeblich zur “reinen” Aspektbildung führt: Es sind dies die Verben *pisat'-napisat'*, *delat'-sdelat'*, *citat'-procitat'*, *varit'-cvarit'*, *stroit'-postroit'*, *igrat'-sygrat'* und einige andere. Diese Verben stehen sich bedeutungsmäßig sehr nahe, so daß zwischen *delat'* und *sdelat'* tatsächlich fast kein semantischer Unterschied besteht. Doch möchten wir das Wörtchen *fast* unterstreichen. Eine genaue semantische Analyse ergibt nämlich, dass den perfektiven Verben *napisat'*, *sdelat'*, *cvarit'*, *procitat'*, *postroit'*, *sygrat'* immer auch die Bedeutungsschattierung des “erreichten Resultats einer Handlung” innewohnt. Diese Bedeutungsschattierung läßt dich aber nicht restlos mit der *grammatischen* Bedeutung des perfektiven Aspektes, wie wir ihn auffassen, gleichsetzen. Man kann behaupten, dass die lexikalische Bedeutung der Verbalpräfixe *na-*, *s-*, *pro-*, *po-*, in den angeführten Verben auf ein Minimum reduziert ist, sie ist aber immer noch vorhanden. Wir werden also die traditionelle Einteilung in “lexikalische” und “grammatische” (oder “leere”) Verbalpräfixe durch die oben vorgeschlagene Einteilung in “qualifizierende (*perepisat'*) und “modifizierende” (*popisat'* ‘eine Weile schreiben’, *napisat'*) ersetzen müssen. (Isačenko, 1962, page 362)

(Incidentally, note that *popisat'* and *napisat'* are treated on a par: that is, as examples of modifying (that is, ‘empty’) prefixes. But *po-* in *popisat'* is translated as contributing a ‘for a while’ shade of meaning, and not a resultative shade of meaning; *na-* in *napisat'* is not translated at all.)

Now the question is, what is to be trusted more: Isačenko’s highly trained intuitions about some undefined ‘shades of meanings’, or the wide-spread intuition that Polish verbs come in pairs, and that some prefixes can be used as a means of deriving aspectual twins. We think the answer is clear. We distrust the ‘shades of meaning’ intuition: it is too fragile and too difficult to test. It seems far more sensible to try and find a way of capturing the general phenomena (supported by native speaker intuitions) of verb pairing instead. And by using the abstract concept of a formant and essentially formal criteria (notably the secondary imperfectivisation and perfectivisation tests) for analysing the notion of aspectual pairs in terms of formants, we were able to give a precise model of native speaker intuitions. Furthermore, we were able to pose some interesting questions, the sort of questions that simply have not been considered in Slavic linguistics: how much structure exists in aspectual pairing? And does this structure induce interesting semantic distinctions?

As we have already noted, Isačenko himself raises the issue of whether the native

speaker intuitions concerning the existence of aspectual pairs should be trusted or not. Isačenko argues against treating prefixal pairs of verbs as aspectual pairs (as is done in traditional and school grammars, and dictionaries). Isačenko wonders why there is no agreement on the ‘interpretation of some grammatical facts about the native language’, and in particular, why Russian native speakers view prefixal pairs as aspectual pairs. He suggests that this cannot be explained by better or worse developed native speaker intuitions, but rather by the absence of ‘objective criteria’ for deciding what a true aspectual pair really is:

In Ušakov’s Wörterbuch werden die Verben *spet’* und *propet’* als perfektive Aspektpartner des Verbs *pet’* ‘singen’ angesehen. Immer wieder stößt man in Polemiken und Buchbesprechungen darauf, dass die Richtigkeit dieser oder jener “Aspektpaare” unter Zweifel gestellt wird.¹⁵ Kann diese weitgehende Uneinheitlichkeit in der Deutung grammatischer Tatsachen der Muttersprache auf ein besser oder schlechter entwickeltes “Sprachgefühl” zurückgeführt werden? Wohl kaum. Diese Uneinheitlichkeit erklärt sich vielmehr aus dem Fehlen fester und theoretisch wohlfundierter Kriterien für die Aufstellung *tatsächlich* bestehender Aspektpaare. (Isačenko, 1962, page 361)

In a sense, with this quotation we have reached the heart of our disagreement with Isačenko (and Maslov and Karčevsky). Isačenko claims to mistrust native speaker intuitions because they are not backed up by objective criteria about what true aspectual pairs really are. But the only ‘objective criteria’ that Isačenko makes use of are his intuitions about the real meaning of aspectual pairs, combined with preliminary theoretical assumptions about the crucial difference between suffixisation and prefixation.

In our view, far more robust objective criteria than this exist, namely the secondary imperfectivisation and secondary perfectivisation tests. But seeing the true power of these tests requires us to make an abstraction — to step up to the word-formational level, and abandon morphemic analysis. Precisely because Isačenko (and others) failed to abstract away from the fact that some affixes used in the aspectual pairing may be derivational and some may be inflectional — that is, because he did not consider the possibility of working at the level of formants — he failed to notice the patterns that our classification reveals.

One of the great strengths of Slavic school analyses of aspect is their incredible attention to detail. If you look for information about particular verbs or constructions, there is no better source for deep information. The weakness of this tradition is precisely the reflection of its strength: there is often a tendency to try and view data in terms of established categories (inflectional vs. derivational, etc.) rather than ask new questions. One of the strengths of the post-Chomskian tradition is its insistence on

¹⁵Here, in a footnote, Isačenko lists some other pairs of verbs built by prefixation (such as for instance *ljubit’* ‘to love’ versus *poljubit’* ‘to have started to love’), and refers to a textbook on contemporary Russian grammar that analyses these verbs as aspectual pairs. Our classification classifies these verbs as class₁ verbs.

posing questions about language on a more abstract level. This thesis was motivated by the conviction that verb pairing was a real and important phenomenon in Polish. This led us to work with *verb/formant(verb)* pairs. And as we have seen, the results of working at this slightly more abstract level are striking, for this is where semantic patterns underlying the Polish aspect system emerge clearly.

Another reason we hope traditional Slavic linguists may find our analysis of interest is the fact that it enables us to rethink the distinction between aspect and Aktionsart in Polish.

In contrast to the concept of aspectual pairs, which is deeply rooted in native speaker intuitions, Polish speakers do not have any ‘feeling’ for the concept of Aktionsart. The concept of Aktionsart in Polish seems artificial, and in Chapter 2 we showed that it has never been made clear what Aktionsart in Polish really is. In spite of several attempts, using both semantic and formal (in particular, morphological) devices, it has never been possible to definitively distinguish Aktionsart from aspect. Most researchers arguing for a distinction between aspect and Aktionsart, more or less explicitly base their argument on the theoretical assumption of a fundamental difference between prefixation as a derivational process, and suffixation as a grammatical process. In principle, this criterion might be accepted as a reliable one — except that there exists the so-called semelfactive suffix *-nq-* (Russian *-nu-*). We have not said much about this suffix till now — and when we consider it we can see that there are additional reasons for finding the equations ‘suffixation=aspect, prefixation= Aktionsart’ extremely dubious.

Among all formants used for aspectual purposes, the *-nq-* suffix is the purest example of a grammatical, or inflectional morpheme — far purer than the imperfectivising ‘suffix’ *-yw-*. The suffix *-nq-* seems to be fairly directly inherited from Proto Slavic. It did not get mixed up with other suffixes, it does not involve unpredictable vowel changes in the root, it is transparent, and even its shape is largely unchanged since the Proto Slavic period. In short, it does not exhibit any of the problems that bother Isačenko when he examines the imperfectivising suffix *-yw-*. And yet Isačenko follows Maslov in regarding this suffix as a ‘semelfactive Aktionsart’ forming suffix — apparently the pure suffix *-nq-* (Russian *-nu-*) does express a shade of meaning.

However Czochralski — who bases his Aktionsart classification on that of Isačenko — does not speak of semelfactive Aktionsart. He explains that before Maslov, pairs of verbs established by the suffix *-nq-* were treated as true aspectual pairs.¹⁶ Czochralski thinks that the traditional pre-Maslovian approach to these verbs is more accurate, and he treats them as members of true aspectual pairs (which means that he treats verbs ending with *-nqć* as basic perfective verbs, which get imperfectivised by morphological change). Indeed, Czochralski devotes a whole chapter to motivating the view he takes on verbs containing the what is typically called ‘semelfactive suffix *-nq-*’, and, needless to say, we cannot present his argument here. It seems thus that in contrast to Isačenko, who tries to base his theory on semantic intuitions, possibly backed up with theoretical assumptions concerning prefixation/suffixation distinc-

¹⁶Incidentally, Karčevsky analysed verbs containing the suffix *-nq-* as expressing a modification of the meaning of the basic verb.

tion, Czochralski tries to base his theory on the morphology of aspect and Aktionsart, and makes only additional appeal to the ‘shades of meaning’ intuitions.

In short, the existence of the ‘semelfactive suffix *-ną-*’ undercuts the formal and semantic criteria of distinguishing between aspect and Aktionsart, and this can lead to contradictory conclusions being drawn even by researchers such as Isačenko and Czochralski, who (at least in theory) agree on all the key issues. This makes the distinction between the two categories even more vague. Our classification shows that suffix *-ną-* is simply one of three formants used for perfectivising unitisable process verbs, and that momentaneous meaning shade reflects the ‘unitisability’ of the verbs in this class.

Let us now come back to the issue of prefixation. As the reader will be by now well aware, Slavist theoreticians typically argue that empty prefixes change the lexical meaning of the basic verb by adding to it the meaning of an achieved result. But this view needs a correction. Our classification reveals that empty prefixes yield the resultative shade of meaning when applied to culminating processes and gradual transitions; but when applied to states, empty prefixes yield an inchoative shade of meaning shade. The Slavic aspectology calls these meaning shades Aktionsarten. But our classification reveals that the resultative Aktionsart and the inchoative Aktionsart do not arise with arbitrary verbs — instead, these Aktionsarten arise when verbs belonging to different classes get perfectivised. This applies to the delimitative Aktionsart and the semelfactive Aktionsart as well. The delimitative prefix *po-* generates delimitative verbs, and our classification has determined to which verbs exactly this prefix can be applied (traditional linguists had no hope to find any regularity behind the distribution of this most widely applicable prefix; compare (Isačenko, 1962, page 391-392)). The semelfactive shade of meaning arises when unitisable process are made perfective. In short, different sorts of verbs produce different kinds of meaning shades when perfectivised, and our classification has captured these regularities.

We might summarize our view as follows. As we said in Chapter 2, Aktionsart was a useful category to have around for classifying constructions which could not be regarded as truly grammatical (since they involved prefixation) and yet which were clearly not meaning changing in the full sense of the word. But, given the approach advocated in this thesis, we don’t need the category of Aktionsart at all. All we have is aspectual formants, and the observation that some types of verbs (notably culminated processes and unitisable processes) have various completion options. If it is accepted that different classes of verbs can ‘react’ in different ways to perfectivising formants, then the vast majority of Aktionsart in Polish is swept away, and all we are left with are aspectual pairs. Aktionsart seem to have functioned as a sort of dustbin for Slavist theoreticians committed to the view that only suffixes can give raise to true aspectual pairs. If it has achieved nothing else, the thesis has shown how to empty the dustbin.

But now to address the final question — where to from here?

To conclude the thesis let us sketch some of the main directions we see for further work. In fact, we see three main directions: corpus-based work to define more accurately the limits of our classification, the expansion of the methods of this thesis (notably aspectual analysis in terms of formants) to other Slavic languages (and

perhaps even languages further afield), and incorporating the semantics of verbal semantics we have developed here into a richer semantic framework.

It would be interesting to do some more detailed corpus work. For instance, it would be interesting to investigate the occurrences of the empty prefix *z(a)-*. If it turns out that there are only a few stative verbs that take this prefix, it would be possible to treat these verbs as exceptions. So we could distinguish between gradual transitions and states by describing the former as taking *z(a)-*, and the latter as taking any empty prefix except *z(a)-*. Furthermore, when mapping the limits of our classification, we used Czochralski's 1960/70 corpus of Polish verbs. This is undeniably an important linguistic resource for Polish, nonetheless, the fact remains that it is based on the Polish of the mid 1960s, and for obvious social and technological reasons, contemporary Polish has changed a great deal in the last forty years (we already saw some evidence of this when we considered the use of the *-ną-* suffix as a perfectivising formant in recent computer words). If our classification is to truly capture what is going on in the Polish of today, it is important to investigate it further, and try and refine it on the basis of up-to-date computer corpora.

The second path that we believe it would be interesting to explore would be to try and apply the methods of this thesis (in particular the use of formant-level analysis) to other languages, and in particular to other Slavic languages. Now, it is not obvious that this will work. Some writers on aspect in Slavic languages seem to believe that if you've solved the problems in one of them, you've solved the problems in them all. We disagree with this attitude. We hope that our basic tool (breaking verb apart from formant) will work for other Slavic languages, but it is certainly not obvious that it will. For example, it seems that Russian permits a certain amount of secondary imperfectivisation. For example, Isačenko writes that the Russian empty prefixised perfective verb *pročitat* 'to have read' can be secondarily imperfectivised to *pročityvat*, and he presents it as an argument undermining the reliability of the secondary imperfectivisation test (Isačenko, 1962, page 363). He also says that in Czech and Slovak, derivation of secondary imperfectives represents a rather regular process (Isačenko, 1962, page 405). Matters are similar in Bulgarian (though perhaps more complex since Bulgarian in addition to the perfective/imperfective distinction also has a perfect tense, that is a past tense of present relevance like the English present perfect, which could complicate the analysis).

So there are difficulties, but it may well be possible to apply the method of formants. For a start it is not completely clear that the Russian data on secondary imperfectivisation rules out the use of our method. A closer look reveals that the Russian, Czech or Slovak secondarily imperfectivised verbs have an iterative reading, and our secondary imperfectivisation and perfectivisation test is about single episode reading. For instance, the Russian verb *pročityvat* seems to be interpreted as 'to read from time to time', and Isačenko himself describes the secondarily imperfectivised Czech and Slovak verbs as 'iterative' verbs. So there may well be scope for further work on other Slavic languages.¹⁷

¹⁷Indeed, we believe it would be interesting to try and apply the method of formants even to some non-Indo-European languages. For example, Georgian has an aspectual system that makes Slavic languages

The third direction for further exploration is perhaps the most obvious one, nonetheless it is also the most important. As we said at the start of the chapter, clarifying how verb pairing works in Polish is only the first step towards understanding the Polish aspectual system. Eventually, we will need to study how aspectuality is raised to the verb phrase, sentence and discourse level, study its interactions with other phenomena, and rework our formal semantics in a richer setting capable of modelling the phenomena of interest.

The basic outline of how the analysis should proceed is fairly straightforward. For example, consider a typical class₃ verb like *czytać* ‘to be reading’. The use of the empty prefix perfective form *przeczytać* ‘to have read’ in the verb phrase *przeczytać książkę* ‘to have read a book’ would have to bear the semantics that the book reading has reached its culmination and hence that (typically) whoever has read the book has finished it. On the other hand, a verb phrase *poczytać książkę* ‘to be reading a book for some time’ which means that whoever was reading the book ceased reading the book (bringing the reading activity to an end, but without implying that any culmination has been reached) would merely need to be given the semantics that some writing of the book has occurred.

Of course, such remarks are very much a bare-bones analysis of the way that aspect interacts with the information (and in particular the information contributed by the noun phrases) at the level of verb phrase. As Henk Verkuyl has so clearly illustrated in his writings, the interaction that takes place at this level can be subtle and demand careful analysis. For example, in a sentence like *Pięć dziewcząt podniosło trzy stoły* ‘Five girls lifted three tables’ the interactions of the perfectivised verb with the information contributed by the two noun phrases raises many subtle issues. Exactly how many liftings have been completed? It could well be that each table lifting occurred at separate time, or indeed all of them did. The writings of Henk Verkuyl have done a great deal to clarify the semantic intricacies that take place at the level of verb phrase and to show how they are compositionally lifted to higher levels.

If this thesis has made a positive contribution it is this. For Polish (and indeed, we suspect for some other languages too) the fact that aspectual marking is so intimately tied to the form of the verb means that the process of computing aspectual composition must begin at the verbal level. Our verb classification does not solve the mystery of aspectual composition. But it does provide a detailed picture of the semantic distinctions drawn at the level of Polish verbs that any compositional account of verbal aspectual semantics will need take into account.

look morphologically impoverished. However, preliminary conversations with Kakhi Sakhltkhtsishvili have indicated that thinking in terms of formants may also be useful there (though at this stage, the idea is rather speculative).

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Samenvatting in het Nederlands

De gangbare kijk op Slavisch aspect is dat het een inherent complex fenomeen is, en dat het vinden van enige essentiële regelmatigheid in het Slavische aspectuele systeem een hopeloze taak is. Als oorzaak van deze zienswijze kan de manier waarop aspectuele kenmerken in het Slavisch gecodeerd worden — gezien door het prisma van gangbare theoretische aannames — worden aangevoerd. In dit proefschrift beargumenteren wij dat deze wijd verspreide zienswijze op Pools aspect incorrect is. Wij betogen dat de overgrote meerderheid van Poolse werkwoorden daadwerkelijk voorkomen in aspectuele paren, conform de intuïties van de sprekers van het Pools als moedertaal. Aspectuele paarvorming is in het Pools simpel en regelmatig, en verre van een mysterieus proces. Wij introduceren een classificatie van Poolse werkwoorden die het mechanisme van aspectuele paarvorming in het Pools blootlegt.

Om de gangbare zienswijze op Pools aspect (en de bijdrage van dit proefschrift) begrijpelijk te maken beginnen wij het proefschrift met een informele les over het Poolse aspect. Wij leggen de basisconcepten uit op een manier waarop een leraar van Pools als tweede taal ze zou kunnen uitleggen aan zijn studenten. Als een fundamenteel concept introduceren wij de notie van een aspectueel paar: een paar van werkwoorden die naar dezelfde gebeurtenis verwijzen, maar waarvan het ene werkwoord de gebeurtenis als voltooid voorstelt, en het andere als onvoltooid; het voltooide lid van een aspectueel paar wordt ook wel eens een ‘perfectief’ werkwoord genoemd, en het onvoltooide een ‘imperfectief’. Het is van cruciaal belang dat één van de twee werkwoorden in een aspectueel paar een basiswerkwoord is waarvan het andere afgeleid wordt door middel van morfologische processen zoals prefixatie of suffixatie. Bijvoorbeeld, het werkwoord *pisać* ‘schrijven-impf’ is een basiswerkwoord dat naar een gebeurtenis van schrijven verwijst die nog niet afgerond is (en kan het beste worden vertaald als ‘aan het schrijven zijn’). Dit onvoltooide werkwoord heeft als zijn aspectuele tweeling het voltooide werkwoord *napisać* ‘schrijven-perf’, dat afgeleid is door middel van het zogenaamde ‘lege prefix’ (dat is, een prefix dat geen lexicale betekenis meer draagt). Dit afgeleide werkwoord duidt op dezelfde gebeurtenis van schrijven, maar stelt het voor als afgerond (en kan het beste worden vertaald als ‘klaar zijn met schrijven’, of ‘geschreven hebben’). Bovendien kan het werkwoord *pisać* ‘schrijven-impf’ ook perfectief gemaakt worden door het zogenaamde delimitatieve prefix *po-*, dat slechts een temporele begrenzing van de gebeurtenis uitdrukt. Toegepast op het werkwoord *pisać* ‘schrijven-impf’, drukt het prefix *po-* uit dat het proces

van schrijven beëindigd is, maar dat het eigenlijk wel voortgezet zou kunnen worden (in tegenstelling tot de lege prefix *na-* dat uitdrukt dat de gebeurtenis (definitief) afgerond is en zich niet verder zou kunnen ontwikkelen). Het perfectieve werkwoord *popisać* kan vertaald worden als ‘een tijdje schrijven’. Het basiswerkwoord *pisać* ‘schrijven-impf’ kan dus op twee manieren perfectief gemaakt worden, maar er zijn ook werkwoorden die alleen een leeg of alleen een delimitatief prefix nemen. Een ander voorbeeld van een aspectueel paar is een paar gevormd door middel van suffixatie. Het werkwoord *kupić* is een voltooid basiswerkwoord en het verwijst naar een voltooide gebeurtenis van het kopen (het kan vertaald worden als ‘klaar zijn met kopen’, of ‘gekocht hebben’). Het onvoltooid tweelingwerkwoord van *kupić* ‘kopen-perf’ is het gesuffigeerde werkwoord *kupować* ‘kopen-impf’ (het kan vertaald worden als ‘aan het kopen zijn’). Als het laatste voorbeeld van de morfologische markerings van aspect kan het zogenaamde semelfactieve suffix *-ną-* genoemd worden. Dit suffix wordt toegepast op imperfectieve basiswerkwoorden zoals bijvoorbeeld *pukać* ‘kloppen-impf’ (‘aan het kloppen zijn’) en *gwizdać* ‘fluiten-impf’ (‘aan het fluiten zijn’), en selecteert een minimale eenheid van de gebeurtenis (wij argumenteren dat het een eenheid met de minimale duur selecteert). Het afgeleide perfectieve werkwoord *puknąć* kan vertaald worden als ‘heel kort/een keer geklopt hebben’, en het afgeleide werkwoord *gwizdnąć* als ‘heel kort gefluit hebben’. Men moet echter in de gaten houden dat sommige werkwoorden wel voltooid genoemd worden, maar toch verwijzen ze niet naar het eindpunt maar naar het beginpunt van een gebeurtenis. Bijvoorbeeld, het imperfectieve werkwoord *wierzyć* ‘geloven’ heeft als zijn perfectieve partner het geprefigeerde werkwoord *uwierzyć* ‘begonnen zijn te geloven’. De manier waarop aspectuele verschillen in het Pools uitgedrukt worden lijkt nog minder overzichtelijk als men bedenkt dat er niet één prefix bestaat dat bij alle imperfectieve werkwoorden als een leeg prefix fungeert. In plaats daarvan, kunnen formeel diverse prefixen als lege prefixen gebruikt worden, maar het is wel zo dat voor elk imperfectief werkwoord maar een prefix bestaat dat als leeg fungeert (hetzelfde prefix kan, wanneer toegepast op een ander werkwoord, de lexicale betekenis ervan helemaal veranderen). Zo ook bestaat er niet één uniek imperfectiviserend suffix dat op alle perfectieve werkwoorden toegepast wordt. Het proces van imperfectiviserende suffixatie, ook al is het meer uniform dan dat van prefixatie, is in feite ook uitgevoerd door verschillende suffixen — sterker nog, het gaat gepaard met verschillende klinker en medeklinker veranderingen in de stem van het basiswerkwoord (vandaar dat wij in plaats van van ‘suffixatie’, van ‘morfonologische verandering’ spreken). Kort en eenvoudig gezegd, vanuit het perspectief van de spreker van een Germaanse taal die het Pools wil leren, betekent het bestaan van aspectuele paren dat hij dus in feite twee werkwoorden moet onthouden als een Pools equivalent van één werkwoord van zijn moedertaal. Bijvoorbeeld, als hij het werkwoord *schrijven* wil leren gebruiken in het Pools, moet hij twee werkwoorden leren: *pisać* (dat hij dan gebruikt als hij over een niet-afgeronde gebeurtenis van schrijven spreekt) en het werkwoord *napisać* (voor het geval dat hij over een afgerond proces van schrijven wil spreken).

Om de complexe manier van het coderen van aspectuele kenmerken in het Pools beter te kunnen begrijpen en analyseren, onderzoeken wij de evolutie van het Pool-

se aspectuele systeem. Tevens duiden wij aan hoe het mechanisme van aspectuele paarvorming, zoals blootgelegd door onze classificatie geïntroduceerd in hoofdstuk 4, diachronisch kon ontstaan.

De niet-uniforme manier van aspectuele codering, gezien door het prisma van strikte theoretische aannames (met name over de morfologische processen), hebben ervoor gezorgd dat aspect een controversieel onderzoeksobject is. De controverse wordt versterkt door het feit dat de basisconcepten in de loop van een lange periode ontstonden, en het resultaat waren van een complexe interactie tussen de Germaanse en de Slavische taalkundige tradities. In hoofdstuk 2 beschrijven wij de geschiedenis van het onderzoek naar aspect (en het gerelateerde fenomeen van ‘Aktionsart’), en plaatsen wij onze benadering van Poolse werkwoordsparen tegen de achtergrond van wat de lezer kan vinden in de rijke literatuur over aspect. Maar waar precies ging de controverse over? Omdat er niet één uniform mechanisme van aspectuele paarvorming bestaat maar twee, werden er discussies gevoerd over wat een legitiem mechanisme van aspectuele paarvorming is. Men ging ervan uit dat de werkwoorden die een aspectueel paar vormen niet in de lexicale betekenis mogen verschillen, maar slechts een oppositie moeten vertonen tussen het onvoltooide en voltooide aspect van de gebeurtenis waarnaar het werkwoord verwijst. Het lelijke eindje van aspectuele paarvorming was altijd de prefixatie. Twee kwesties betreffende de prefixatie hebben de aspectologen de meeste zorg gebracht. Ten eerste hebben de aspectologen zich afgevraagd hoe de prefixatie als een legitiem mechanisme van aspectuele paarvorming beschouwd zou mogen worden als de prefixen toch voornamelijk voor derivatieve doeleinden gebruikt worden — dat wil zeggen, ze worden meestal gebruikt om nieuwe werkwoorden (dat is, werkwoorden met nieuwe lexicale betekenissen) te vormen. Ten tweede, de aspectologen vonden het bezwarend dat de prefixen die als lege prefixen gebruikt worden met een aantal lexicale betekenissen geassocieerd kunnen worden (de betekenissen waarmee de prefixen geassocieerd worden zijn de betekenissen van de preposities waarvan de prefixen zijn ontstaan). Zo ver over de perfectiverende prefixatie. Waren er ook bezwaren over de imperfectiverende suffixatie? Niet echt. Verrassenderwijs hebben de meeste aspectologen zich geen zorgen gemaakt over het feit dat suffixen ook wel eens voor derivatieve doeleinden gebruikt kunnen worden, en dat suffixatie ook niet helemaal uniform is, en bij nader toezien verschillende vragen oplevert. Deze twee manieren waarop een aspectueel tweelingwerkwoord van een basiswerkwoord kan worden afgeleid (waarbij dus de prefixatie altijd een twijfelgeval was), en het feit dat het basiswerkwoord ook een bepaald aspect uitdrukt, leidden tot de volgende, nooit definitief beantwoorde vraag: is aspect een grammaticale, een derivatieve, of een lexicale categorie? Eén zienswijze, de ‘neo-traditionele’ zienswijze, heeft zich in de jaren 1960 uitgekristalliseerd tot de klassieke positie in de Slavische onderzoekstraditie: alleen paren die gevormd zijn door middel van suffixatie zijn echte aspectuele paren, omdat alleen suffixatie een grammaticaal proces voorstelt. Voor het ‘minder legitieme’ mechanisme van aspectuele paarvorming werd het concept van Aktionsart gebruikt, dat wel eerder geïntroduceerd was, maar zich in de Slavische taalkunde tot in de jaren 1960 niet heeft kunnen doorzetten. De notie van Aktionsart werd gebruikt als een term voor afgeleide werkwoorden die niet

als echte tweelingwerkwoorden gezien mochten worden voor de basiswerkwoorden, maar waarvan ook duidelijk was dat ze de lexicale betekenis van het basiswerkwoord niet echt veranderden (maar hoogstens ‘in meer detail beschreven’, of ‘modificeerden’). De notie van Aktionsart kwam van pas voor de geprefigeerde werkwoorden — een werkwoord zoals *napisać* werd een werkwoord van ‘resultatieve Aktionsart’ genoemd. Nu kon dus de vraag naar het legitieme mechanisme van aspectuele paarvorming ook op een andere manier geformuleerd worden: wat is aspect (dat gerealiseerd wordt als een aspectueel paar) en wat is Aktionsart; wat is het verschil tussen de twee? De klassieke positie van de neo-traditionele Slavische taalkunde heeft natuurlijk een zekere elegantie, en zij maakt het ook mogelijk om trouw te blijven aan de aanname dat prefixatie een derivationeel en suffixatie een inflectioneel proces is. Een nadeel van deze zienswijze is echter dat in dat geval het Slavische werkwoordssysteem niet gekarakteriseerd kan worden als bestaande uit aspectuele paren want de meeste basiswerkwoorden zijn imperfectief en vormen aspectuele paren door middel van prefixatie. En zoals de Slavische onderzoekers wel degelijk beseften: een Slavisch werkwoordssysteem kan zonder een volledig systeem van aspectuele paren niet goed functioneren.

In ons proefschrift werken we op een hoger niveau van formanten. Wij abstraheren van de vraag of een prefix of een suffix gebruikt wordt in het proces van aspectuele paarvorming — een affix dat gebruikt wordt om een tweelingwerkwoord voor een basiswerkwoord af te leiden is simpelweg een (aspectueel) formant. Het onderzoek naar de evolutie van het aspectuele systeem in het Slavisch maakt deze strategie meer dan aannemelijk.

Zoals wij in hoofdstuk 2 aangetoond hebben, werd aspectologie door een complexe interactie tussen de Slavische en de Germaanse onderzoekstraditie gecreëerd. De Germaanse aspectologie heeft een fundamentele verandering ondergaan in de jaren 1960, naar aanleiding van de Chomskiaanse revolutie. In hoofdstuk 3 houden wij ons bezig met invloedrijke moderne benaderingen uit de post-Chomskiaanse traditie die weliswaar voor de Germaanse talen ontwikkeld waren, maar die later ook op het Slavisch toegepast werden. Wij onderzoeken de benadering van Verkuyl en Krifka, en hun latere toepassingen op het Slavisch door Schoorlemmer en Filip, respectievelijk. Wij karakteriseren deze benaderingen als gebaseerd op parallellisme, omdat hun centrale idee is dat er een parallellie bestaat tussen de Slavische markering van perfectief aspect en het Germaanse bepaalde lidwoord. Wij argumenteren tegen het idee van parallellisme door de empirische basis ervan in twijfel te trekken.

De vragen en inzichten van de Slavische en Germaanse onderzoekstradities dienen als achtergrond waartegen wij onze benadering tot Pools aspect, die we in hoofdstuk 4 introduceren, willen plaatsen; in zekere zin willen wij graag een synthese van de inzichten van beide tradities bouwen. In onze benadering gaan we uit van ons vertrouwen in de intuïtie van de spreker van het Pools als moedertaal dat Poolse werkwoorden in aspectuele paren voorkomen. De fundamentele observatie met betrekking tot aspectuele paren is dat een basiswerkwoord een bepaald aspect heeft dat veranderd kan worden door middel van een formant (zij het een prefix of een suffix), en dat bepaalde soorten werkwoorden met bepaalde soorten formanten kunnen combineren.

Wij werken met de volgende structuur van een aspectueel paar: een basiswerkwoord versus een formant op het basiswerkwoord. Wij stellen een simpele vraag: met welke formanten kan een bepaald werkwoord combineren? Deze vraag leidt tot de centrale vraag van dit proefschrift: is er een systeem achter de mogelijke combinaties van werkwoorden met formanten? Deze vraag leidt tot onze classificatie. Wij introduceren een classificatie van Poolse werkwoorden die het mechanisme van de aspectuele paarvorming blootlegt, en vastlegt. Onze classificatie is ‘formant-gestuurd’: wij delen Poolse basiswerkwoorden op in vijf klassen op basis van de patronen van aspectuele affixatie waar ze binnenvallen. Als een formeel criterium voor de karakterisering van een affix als een (aspectueel) ‘formant’, introduceren wij een “Secondary Imperfectivisation” test en zijn spiegelbeeld, de “Secondary Perfectivisation” test. De twee testen leveren als formanten vier soorten affixen: het lege prefix (“ep”, staat voor “empty prefix”), het delimitatieve prefix (“po-”), het semelfactieve suffix (“-nq-”), en het imperfectiverende suffix (“mpc”, staat voor “morphological change”). De vijf basisklassen van werkwoorden die onze classificatie oplevert weerspiegelen de mogelijke combinaties van basiswerkwoorden met deze formanten. De classificatie is een classificatie in de sterke zin van het woord: zij geeft noodzakelijke en voldoende voorwaarden om elk werkwoord (waarop zij van toepassing is) tot een unieke klasse toe te kennen. Om de formele aard van de classificatie duidelijk te maken, presenteren wij haar in vorm van een tabel, en ook in vorm van een eenvoudig Prolog programma. In weerwil van haar in essentie formele aard, toont onze aspectuele classificatie een aanzienlijke semantische regelmatigheid in het Poolse werkwoordssysteem. De classificatie leidt inderdaad tot temporele onderscheidingen van Poolse werkwoorden, onderscheidingen die veel lijken op Vendler-achtige onderscheidingen. In eerste instantie beschrijven wij de semantische verschillen die onze classificatie oplevert op een informele manier, en in het volgende hoofdstuk, hoofdstuk 5, formaliseren wij de blootgelegde semantische verschillen.

In hoofdstuk 5 onderwerpen wij de classificatie aan een nauwkeurig onderzoek, evalueren ons werk en schetsen de richtingen voor verder onderzoek. Wij bepalen de beperkingen van de dekking van de classificatie, motiveren het gebruik van de lege prefixen (gezien dat het bestaan van lege prefixen nog steeds een controversiële kwestie is), en formaliseren de semantische onderscheidingen die onze classificatie oplevert gebruikmakend van modale semantiek. Het formele model van de classificatie laat zien dat de aspectuele oppositie tussen het onvoltooide en het voltooide werkwoord op een hoog niveau gekarakteriseerd kan worden in termen van de vertrouwde oppositie tussen ‘ongoing’ en ‘completed’. Op een lager niveau blijkt echter dat er wel een verschil bestaat tussen de gangbare denkwijze over de oppositie tussen het perfectieve en het imperfectieve aspect, en de denkwijze die onze classificatie suggereert. Onze classificatie maakt namelijk zichtbaar dat het imperfectieve aspect niet, en het perfectieve aspect wel gevoelig is voor de soort van de gebeurtenis waarnaar het werkwoord verwijst.

Wat hebben wij bijgedragen aan de Westerse en Slavische onderzoekstradities? Wij geloven dat wij vooruitgang hebben geboekt vanuit het Westerse perspectief. De belangrijkste bijdrage zou kunnen zijn dat wij aangetoond hebben dat het niveau van

het werkwoord in het Pools een aantal belangrijke semantische onderscheidingen ondersteunt. Deze onderscheidingen zijn gebaseerd op het vertrouwde verschil tussen ‘ongoing’ en ‘completed’, maar onze analyse laat ook zien dat werkwoorden in verschillende klassen op verschillende manieren voltooid kunnen worden. Wij hebben ook laten zien dat het mogelijk is om de belangrijke ideeën van onze analyse te formaliseren. Maar omdat dit proefschrift geschreven is in de post-Chomskiaanse traditie, de meer interessante vraag die gesteld kan worden is: wat hebben wij bijgedragen aan de Slavische traditie? Als belangrijkste bijdrage aan de Slavische traditie kan de nieuwe methodologie genoemd worden (met name, het werken op het niveau van formanten), en het oplossen van de vraag naar de relatie tussen aspect en Aktionsart. Onze classificatie toont aan dat wat in de neo-traditionele aspectologie een ‘Aktionsart’ werkwoord wordt genoemd, simpelweg een weerspiegeling is van de lexicale betekenis van het werkwoord dat perfectief wordt gemaakt (dat wil zeggen, van het werkwoord waarvan het ‘Aktionsart’ werkwoord afgeleid wordt); of, om het anders uit te drukken, ‘Aktionsart’ is een reflectie van de soort van gebeurtenis die als afgerond wordt verklaard. De bijdrage die wij bijzonder belangrijk vinden is dat onze classificatie niet alleen laat zien dat er wel een systeem bestaat dat de compositie van werkwoorden met formanten aanstuurt, maar dat zij ook de patronen van de aspectuele paarvorming blootlegt.

Wij zien drie richtingen voor verder onderzoek: corpus-gebaseerd werk om de beperkingen van de classificatie preciezer te definiëren, een toepassing van de methodes van dit proefschrift (met name een aspectuele analyse in termen van formanten) op andere talen, en het opnemen van de door ons ontwikkelde semantiek van werkwoorden in een analyse van Pools aspect op het niveau van de verbale woordgroep, de zin, en de discourse.

Wij hopen dat ons proefschrift nuttig kan zijn voor aspectologen van de Germaanse en de Slavische tradities.

Streszczenie w języku polskim

“Tworzenie par aspektowych w języku polskim”

Zwyczajowo się postrzegać system aspektowy w językach słowiańskich jako złożony, nie dający nadziei na znalezienie w nim istotnej regularności. W niniejszej pracy wykazujemy, że w odniesieniu do języka polskiego pogląd ten jest błędny. Argumentujemy, że znaczna większość polskich czasowników tworzy pary aspektowe, oraz że proces tworzenia tych par jest prosty i regularny. Przedstawiamy klasyfikację polskich czasowników, która uwidacznia mechanizm tworzenia tych par.

Motorem naszej klasyfikacji są ‘formanty’: dzielimy czasowniki polskie na pięć podstawowych klas według wzorców afiksacji aspektowej, które te czasowniki naśladują (afiksy aspektowe nazywamy formantami). Jednak pomimo jej formalnego charakteru, nasza klasyfikacja aspektowa ujawnia znaczną semantyczną regularność wewnątrz polskiego systemu czasownika. W istocie klasyfikacja nasza nakłada na polskie czasowniki rozróżnienia czasowe, przypominające rozróżnienia Vendlera. Formalizujemy owe rozróżnienia za pomocą semantyki modalnej.

W niniejszej pracy opisujemy również ewolucję polskiego systemu aspektowego, oraz wyjaśniamy, w jaki sposób nasza klasyfikacja mogła powstać z perspektywy diachronicznej. Prezentujemy też historię badań nad aspektem i rodzajami czynności, oraz lokalizujemy, gdzie analiza par czasownikowych przedstawiona w niniejszej pracy różni się od analiz, jakie czytelnik może znaleźć w bogatej literaturze na temat aspektu. Przedstawiamy dziedzinę aspektologii jako powstałą w wyniku długotrwałej interakcji pomiędzy lingwistyczną tradycją germańską oraz słowiańską. Odnosimy również poglądy zawarte w tej pracy do poglądów, jakie czytelnik może znaleźć we współczesnych pracach nad aspektem w językach słowiańskich, napisanych w tradycji post-Chomskiańskiej.

Mamy nadzieję, że niniejsza praca będzie przydatna badaczom zainteresowanym aspektem, zarówno pracującym w tradycjach słowiańskich jak i germańskich.

Curriculum vitae

Anna Katarzyna Młynarczyk was born in Poland on December 22, 1973. Between 1993 and 1998, she studied German and Dutch Philology at the University of Warsaw, the Humboldt University of Berlin, and the Free University of Berlin. She defended her Masters thesis on German Philology in 1996 in Warsaw, and her Masters thesis on Dutch Philology in 1998 in Warsaw. In August 1999, she joined the Utrecht Institute of Linguistics. This thesis is the result of the work done there.